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OVER THE PAST SEVEN YEARS

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SCIENTIFIC AND ISLAMIC JURISPRUDENCE PERSPECTIVES

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LIFESTYLE METABOLIC AND STRESS- RELATED MEDICAL DISORDERS: SCIENTIFIC AND RELIGIOUS PERSPECTIVES

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GERIATRICS AND END OF LIFE ISSUES: BIOMEDICAL, ETHICAL AND ISLAMIC HORIZONS.

2007:
HIV/AIDS: SCIENTIFIC ETHICAL AND ISLAMIC DIMENSIONS

2008:
WOMEN'S ISSUES: ISLAMIC PERSPECTIVES.

FIMA Year Book 2009

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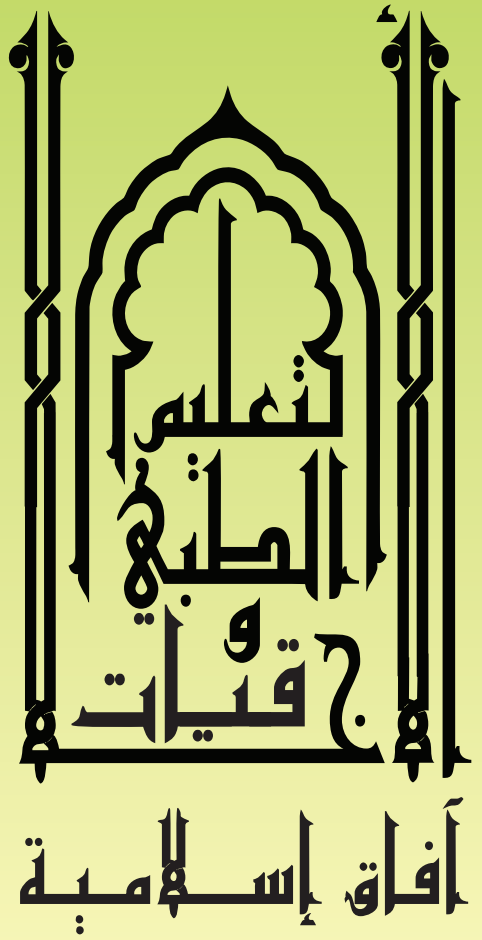
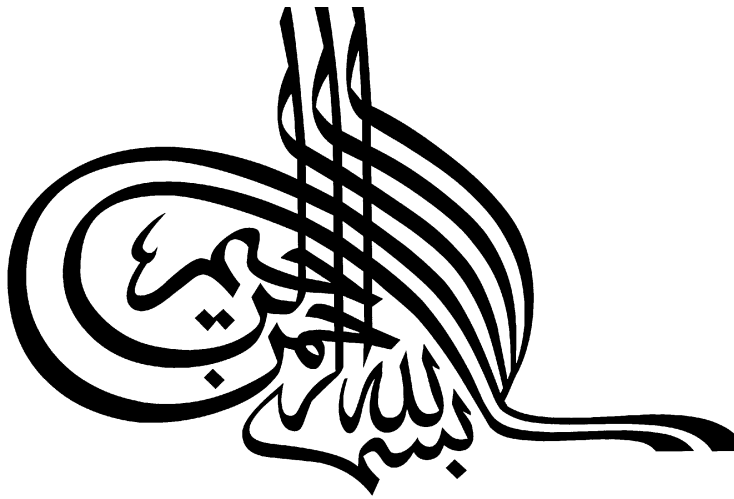
FEDERATION OF ISLAMIC MEDICAL ASSOCIATIONS الاتحاد العالمي للجمعيات الطبية الإسلامية



MEDICAL EDUCATION AND PROFESSIONAL ETHICS:
ISLAMIC INSIGHTS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Medical Education And Professional Ethics:
Islamic Insights

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Editorial

Dear FIMA members

Assalamu Alaykum

Bismillah al-Rahman al-Rahim

Praise be to Allah the Most Merciful, the Most beneficent. May Allah shower His blessings and peace on His Prophet and Messenger Muhammad (PBUH)

I begin by thanking the FIMA Executive Committee for honoring me with the responsibility to be the Editor-in Chief again for this yearbook. I thank Allah for giving me this opportunity and enabling me to accomplish this task. I pray to Allah (SWT) to accept my effort in His way and to reward all who participated in this effort.

The term Islamic medicine was introduced few decades ago. Several conferences have been held to address it, the first of which was The first International Islamic Medical Conference held in Kuwait in 1980. The term has been understood in several ways including Prophetic medicine[1-3]. Now it is generally agreed to use the term Islamic medicine to identify medicine that incorporates the Islamic philosophy of medicine and that it is distinct from the term Prophetic medicine. Islamic medicine can only materialize from provision of Islamic medical education. Because of the growing interest in this important topic, the Consortium of Islamic Medical Colleges (CIMCO) proposed Islamic Medical education to be the theme this yearbook. The Executive Committee of FIMA approved this proposal and decided to specifically outline CIMCO activities. Hence the theme of this issue is Medical Education and Professional Ethics: Islamic Insights.

We at the Editorial Board invited several distinguished FIMA members, some of whom are also members of (CIMCO), to write on the different aspects of this topic. The result is a comprehensive collection of articles that I hope you will enjoy and motivate all of us to pursue the development of Islamic medicine, a worthwhile goal.

Dr Omar Kasule believes that there is a dichotomy in the current medical schools' curriculum. There are two systems; traditional Islamic and imported

European systems that is the cause of the intellectual weakness of the students / physicians. The solution as he sees it is the integration of the two systems in medical education. He discusses his experience in integrating Islamic values in the medical curriculum, a program he called the Islamic Input in Medical Curriculum (IIMC). He reports the successful implentatation of IIMC in the Kulliyyah (Faculty) of Medicine of the International Islamic University in Malaysia (IIUM) and later on in other universities in Southeast Asia. Dr Kasule prepared teaching materials, trained the faculty members to teach both modern medicine and Shariah principles. Dr Kasule believes that the ethicolegal issues can be resolved by using the tools of MAQASID (purposes) al Shariah and jurisprudence principles. In this paper Dr Kasule gives a comprehensive list of references to all his concepts, works, lectures, essays, presentations, etc…. all available on his website.

Drs Tayyab Hassan and Hamdan Noor, in their article stress the importance of the educational attitude of the students in the pre- clinical years .They argue that to gain the maximum benefit from education and the proper attitude, divine guidance is essential. While they believe that spirituality has been missing from the education system , they describe a trend in Western societies to reintroduce it. In Muslim countries, there should be emphasis on the model of medical education that not only binds the sciences together but also includes the Qur'an and the Sunnah in the medical curriculum. The Qur'an addresses both physical and spiritual components as related to health. This means that the Islamic philosophy of medicine is distinct and needs to be taught in our medical schools . They recommend that students learn to obtain spiritual history of their patients, study of the Prophet's Seerah specifically as a role model , learning the Du'a and the beautiful names of Allah (SWT). Also they need to be taught complementary and alternative medicine. These measures will promote the personal and professional development of the students as pious Muslims, life long learners, and competent and kind physicians.

Dr Afshan Khan advocates the use of the Problem Based learning (PBL) and Self Directed Learning (SDL) model of education that not only binds the sciences together but will bring relevant Islamic medical ethics and references from the history of medicine during the early Islamic period into play. She favors the SPIRAL integration of the medical curriculum with core areas of Islamic Medical Instruction (IMI)in tandem with the medical subjects. She envisions that students can be asked problems that directly or indirectly address aspects of Islamic medical ethics and Islamic civilization.PBL packages can be written so that participants research issues related to Shariah and Fiqh.

While it seems that professionalism is part of ethics, Dr Shaharom opines that it should be treated as a distinct entity. It defines the practice of medicine as

a moral endeavor that requires a rigorous application of behavioral and ethical standards in addition to the scientific training. He defines professionalism to include dedication, respect, compassion, empathy, honesty, altruism, responsibility, integrity, self respect, magnanimity, and accountability. The author believes that most of these characters are embedded in the Qur'anic teachings . These principles as well as the Islamic teachings could be incorporated in the student- centered approach of learning. Dr Shaharom believes so strongly in this aspect of Islamic medical education that if this program is instituted in the early college years, students who are unwilling to be properly educated can be identified. They need to be counseled .If they show no signs of improvement, they should be guided to leave medicine as a career.

Dr Osman expands on this concept . He describes its implimentation at the Kulliyyah of Medicine at IIUM.A specifically designed module in medical professionalism and proper physician etiquette has been organized for third year medical students prior to their first encounter with patients. This module teaches four attributes: expertise, ethics, communication, and compassion. It incorporates Islamic values and practice of Islamic culture as the proper greeting(giving salam), and observing good Akhlaq (manners). In addition, to didactic teaching, a workshop is organized which incorporates case studies that represent the following themes: appearance and composure, examination of a patient of the opposite sex, medical confidentiality, verbal consent, refusal of treatment at own risk discharge, breaking bad news, and making Du'a before procedures .

Drs Hassan, Khan, and Abdul Rahman discuss "Muslim Contribution to Research, Past, Present, and Future". They describe how Islamic teachings and the environment in which they lived sparked the pursuit of learning and research by scientists of the early Islamic period, how the Muslim physicians and scientists established centers of learning all over the Muslim World, and how the Arabic language became the language of learning. The authors describe the establishment of libraries, medical schools, and a system of formal medical education primarily through apprenticeships. This Islamic civilization spanned close to 1000 years. Then they discuss the factors that led to the decline of Islamic civilization/science. We are now lagging behind other nations in scientific output. The authors report that the number of cited publications from six Muslim countries : Indonesia, Pakistan, Egypt, Iran, Saudi Arabia, and Malaysia to be miniscule compared to the developed countries. Although the output has tripled from 2005 to 2009, the authors state that is not good enough as the output has increased during the same period six fold from the Netherland, and nine-fold from Israel. Muslim countries do not provide the proper environment for science to flourish. Muslim scientists have to move to the West to pursue their academic careers. Many of them excel in their fields and become world

famous. So it is clear that the talents are there but Muslim countries do not have the infrastructure to nurture and support the young scientists to make them productive. The authors then submit a stepwise plan to correct this glaring deficiency . This should be based on inculcation of research culture in the medical students and the inculcation of Islamic values that propelled the advancement in the early Islamic era. The suggested strategy includes, among many others, the following :

1.establishing endpoints that is respectable research output from Muslim countries.

2. establishing Muslim medical institutions which include SPIRAL integration of research and Islamic values with medical curricula. Students have to learn research as a standard subject not as an option or area of interest.

Clearly, such efforts cannot succeed without commitment of the government. This means more financial support, and ensuring the independence of the universities. Funding can also be provided by private sources. I can add that in the Gulf countries there is a movement in that direction. A University of Science and Technology has been established in 2009 as well as stem cell research centers in Jeddah and Riyadh, Saudi Arabia. New modern research centers have been established in Qatar, and in United Arab Emirates. Hopefully this trend will continue and expand in other fields of medicine and to other Arab and Muslim countries.[4-7]

As mentioned by Dr Hassan et al it is important to inculcate research culture in the medical curriculum. This should not stop there. Residents in training should be asked to participate in research either basic or clinical. Faculty members should be required to initiate meaningful research . They should be supported by their medical schools financially and by giving them dedicated time for research. Private practitioners can and should perform clinical research.

Dr Faroque Khan in his article stresses that . He gives examples of his own experience as well as several other clinicians who made important discoveries. All that is needed is scientific curiosity, astute observation, persistence, and I may add hard work.

In my article in this issue " Ethics of Clinical Research: An Islamic Perspective" I reiterate the glorious history of research in the early Islamic period and that Islam exhorts us to pursue learning and research. Then I draw attention to the pitfalls that may occur while conducting clinical research i.e. dishonesty in reporting results or abuse of the research subjects. Unfortunately these still happen. Ethical principles have been articulated by the World Medical Association in 1964 at a meeting in Helsinki, Finland; the Declaration of Helsinki.

It has been updated several times, the last of which was in the meeting at Seoul, South Korea in 2008.Guidelines were developed by the Council of International Organizations for Medical Sciences (CIOMS) in 1982.These have been updated in 2002. The Islamic Organization of Medical Sciences(IOMS) convened a conference in Cairo, Egypt in 2004 to relate Islamic principles to the CIOMS guidelines. It published "The International Ethical Guidelines for Biomedical Research involving Human Subjects: An Islamic Perspective". Basically, IOMS found that most of these guidelines are in conformity with Islamic rulings. In my article I point out some of the differences. I also stress the importance of integrity in clinical research as an amana (trust) that is a basic principle of Islam. We continue to hear about drug companies falsifying data about the safety of their products or at least hiding any negative findings.[8] While this is shameful, it will be doubly so if committed by a Muslim scientist or institution. It is sad to see the government of Turkmenistan, a predominantly Muslim country, forcing its employees to falsify statistical data presumably to improve its international standing.[9] Muslims who have taqwa (God-consciousness) should be the first to promulgate those ideals as we are given the privilege by Allah to care for His most honored creation, the human race.

Many of the multinational drug companies are now conducting research on new medications or products in developing countries, many of which are Muslim majority countries. CIOMS Guideline 3 directly and Guidelines 10, 12, 21 indirectly address this situation. Muslim physicians should monitor these externally sponsored research in their own countries .They need to ensure that the ethical guidelines are applied and that they are not less stringently applied than when applied in the sponsoring organization[s] countries.

Dr Aly Misha'l in his article chooses another term for the Islamic input in medical education i.e. Tarbiyah (moral upbringing). He believes the term derives its origin from Islamic values which harmonize man's relationship with his Creator, fellow humans, and the environment. Tarbiyah is the manifestation of Tawhid, as it integrates matter and soul, body and mind. Dr Misha'l stresses the fact that science in general and medicine specifically is a form of worship. It is the means that we exercise thinking and contemplation in God's creation as we are ordered to do in several Qur'anic verses. Medical care provided with the proper intention to save human lives and alleviate human suffering is also a form of worship.

Dr Misha'l also addresses the concept of medical bioethics. He defines it as the application of recognized principles in making decisions about medical practice and research. Islamic medical ethics in addition has to depend on legal codes derived from al-Shariah.

Drs Iqbal Khan, Rehan Khan, and Masood Anwar elaborate on this point. They opine that "Islamic ethics is far more superior than Western medical ethics as it protects both the doctor and the patient not only from the sins of worldly standards but also of divine standards too."

In this conjuncture I will add that the recent biotechnological advances, e.g, the various assisted reproductive technologies including gamete donation and surrogacy, stem cell research, cloning, organ donation, etc. raised major ethical, social, religious and legal issues. Islamic organizations consisting of Islamic scholars, physicians, scientists have been formed to give the Islamic perspective on these issues. Examples include IOMS, Rabitat al-'Alam al-Islami, Federation of Islamic Medical Associations (FIMA) and in North America, the ethics committee of the Islamic Medical Association of North America (IMANA), a member of FIMA , and many others. The latter published position papers about Islamic medical ethics, and stem cell research in booklet formats,[10,11] while Islamic scholars issue fatwas (religious decrees).

Drs. Iqbal Khan et al also argue that the most significant constituent of an effective curriculum for Muslim doctors is the integration of behavioral elements based on the truthful understanding of Islamic medical ethical values. They stress the importance of the teacher as a role model for the students and the importance of having an Islamic environment in the medical educational institution / teaching hospitals. They also stress the importance of continuing medical education.

In another article Dr Iqbal Khan along with Dr Anis Ahmed stress the importance of quality control in higher education. Measures have to be in place to assess the quality of the infrastructure, the services, human resources, curricula, instructional strategies, and research quality. It should also assess the quality of the student selection process , their as well as the alumni performance. The quality assessment should address the academic counsel and faculty development. They equate quality control with the Islamic concept of Ihsan(excellence). They propose different of quality control models and describe benchmarks to be used in the assessment.

In this yearbook the different aspects of integrating Islamic values in medical education, research, practice and ethics is presented. It does bring out idealistic ideas but all can be implemented if there is a determined leadership. It behooves all of us to keep these lofty goals in mind and to work hard to implement them everyone in his or her sphere of responsibility. We ask that FIMA takes a leading role and to continue its efforts in this regards.

I conclude by thanking all the authors who contributed to this issue. I especially thank Drs Aly Misha'l, Abul Fadl Ebrahim, and Musa Nordin for their valuable

help and guidance. I sincerely appreciate the work done by Dr Misha'l's staff for copyediting and proofreading of the manuscripts, especially Miss Elham Mohammad Swaid.

I pray that Allah (SWT) accept and bless our efforts in His service. May Allah (SWT) guide us to the right path and have mercy on us. Amen.

Wassalam

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Federation Of Islamic Medical Associations (FIMA) in Brief

- Established at the outset of the 15th Hijrah century, December 1981, in Orlando, Florida, USA, where senior leading medical figures representing ten Islamic medical organizations, from various parts of the world, convened and laid down the foundation of the Federation.
- Subsequently FIMA was incorporated in the State of Illinois as a non-profit organization, then acquired the special consultative status with the United Nations Economic and Social Council (ECOSOC).
- Since that time, FIMA membership progressively expanded to include 25 full members, 9 associate members, and more than 15 prospective and collaborating organizations from all over the world.
- Most FIMA activities and achievements are based on the endeavors of its member Islamic Medical Associations, in constructive mutual cooperation, and harmonious understanding.
- These activities include, but are not limited to:
  1. Cooperation in medical relief work, where and when needed in disaster stricken countries. The last endeavor was the " Save Vision Campaign", where more than 45,000 cataract and intra-ocular lens surgeries were performed in Darfur-Sudan, Chad, Somalia, Senegal, Nigeria, Burkina Faso, Sri Lanka, Indonesia, Afghanistan and Pakistan by ophthalmology teams volunteering from IMAs from several countries.

     This activity qualified FIMA for a distinguished award from the American College of Physicians (ACP), designated for outstanding humanitarian achievements.

     Training of local medical professionals in some of these countries was instrumental in continuing and widening of these activities by local talents.

     In Gaza and other Palestinian Occupied Territories, FIMA has been functional in establishment of eye facilities, provision of ophthalmology equipments, as well as training of doctors and other paramedical personnel.

     Over the past year, two new humanitarian activities were launched in Sudan: The cleft palate-cleft lip, and the vesico-vaginal fistula projects. Both problems were highlighted by the IMA of Sudan as locally needed projects in some districts.
  2. Scientific, professional and ethical jurisprudence related conferences, seminars and publications.

3. Establishment of the Consortium of Islamic Medical Colleges (CIMCO), to foster cooperation in improvement of curriculum, training, research, administration, and up-bringing of model medical practitioners.
4. Establishment of the Islamic Hospitals Consortium (IHC), to pursue cooperation and coordination among medical professionals and hospital administrators in areas of experience exchange, improvement of health care delivery, ethical, administrative and operational activities, to meet the most advanced international standards, in the context of Islamic principles.
5. Publication of FIMA Year Books, which address biomedical ethical issues that are needed for medical practitioners, educators as well as Jurists.
6. Medical students activities, including conferences, seminars, publications, camps, Umrah and Ziarah programs.
7. Collaboration to extend a helping hand to Muslim medical practitioners in underprivileged countries, to work together and organize professional medical societies.
8. CME programs, and establishment of a Council of highly qualified professionals for development, improvement and supervision of these activities.
9. Establishment of Resource Centers, such as the HIV/AIDS Resource Center, Islamic Biomedical Ethics Resource Center, and in the planning, is the Women's Affairs Resource Center.
10. HIV/AIDS prophylactic, social and therapeutic activities have been underway in several countries for the past two decades.

Islamic medical activities of FIMA have a holistic nature. Leadership, mutual cooperation and innovation are prerequisites for the welfare of our communities, our Ummah and humanity at large.

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A 13-Year Experience Of Integrating Islamic Values In The Medical Curriculum In South-East Asia:

a model of Islamization of knowledge, tajribat al mudkhalat al islamiyyah fi al manahij al tibbiyyah fi junub sharq asia: namudhaj al ta' asil al islami li al tibb

Omar H. Kasule*

Abstract

The paper traces the historical development of the Islamic Input in the Medical Curriculum from its inception in 1995 to date. The Islamic Input in the Medical Curriculum (IIMC) integrates Islamic values and Law in the teaching and practice of Medicine. It was successfully implemented over a 13-year period (1997-2010) at the Kulliyah of Medicine of the International Islamic University Malaysia and for varying and shorter periods at other schools of medicine in and outside Malaysia. IIMC achieved Islamization of the curriculum through integrating of the teacher (teacher of medicine also teaches Islamic values), the teaching materials (Islamic values and law related to medical knowledge), and assessments (questions on Islam included in the examinations). IIMC has 5 objectives:

(a) introduction of Islamic paradigms and concepts in medicine, *mafahiim Islamiyat fi al Tibb*. (b) Strengthening faith, *iman*, through study of Allah's sign in the human body. (c) appreciating and understanding the juridical, *fiqh*, aspects of health and disease, *al fiqh al tibbi*. (d) Understanding the social issues in medical practice and research and (e) Professional etiquette, *adab al tabiib*, from the Islamic perspective. Students who have graduated from the program are now practicing physicians and are involved in a new initiative to establish and run Islamic hospitals that follow Islamic values in their practice.

Keywords: *Medical curriculum, Islamic medical education, Islam, Islamic Jurisprudence.*

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Introduction

The paper traces the author's journey in the development of the Islamic Input in the Medical Curriculum and its theory and practice over a period of more than two decades. It delineates distinct stages: definition of an Islamic epistemology, definition of Islamic and prophetic medicine, definition of the philosophy of Islamic medical education, preparation and implementation of IIMC at the Kulliyah of Medicine UIA, training of IIMC teachers, dissemination of IIMC and its supporting materials (to other medical schools, medical practitioners, and *ulama*, using the internet and face-to-face workshops), and further theoretical developments on Islamic concepts (in basic medical sciences, ethics and law, social and preventive medicine, and personal development of the physician). The sequence above was correct in essence but there were overlaps between stages. The date of publication or presentation of concepts is also not a true indicator of their genesis. Many concepts were incubated in the author's mind for a long time before public presentation. The future stages envisaged in the sequence are evaluation of the impact of IIMC and extending IIMC to postgraduate education. The paper is mainly a record of history and the same paper title has been quoted with dates reflecting changes in thoughts with passage of time as ideas fermented and matured. The paper is written in the first person and in the past tense for ease of historical narration.

Start In The Early 1980s

My journey towards the Islamic Input in the Medical Curriculum started in 1981 when I presented a paper at the First International Conference of Islamic Medicine that was held in Kuwait. I made an argument in that paper that the practice of modern medicine must reflect Islamic values[1]. The paper was well received but it went against the general interest of the conference which was historical Muslim medicine. At the Second Conference of Islamic Medicine also held in Kuwait in 1982, I presented a paper arguing that Islamic medicine must be reflected in practical medical aid for the poor and the destitute and I used Africa as a case in point[2]. I revisited this issue in 1998[3] but it did not hold my attention for long. I was intellectually restless because I was not comfortable with the idea of Islamic medicine being seen in a historical perspective only. I was equally unhappy with Islamic medicine being seen only as delivering charity medical services. I sought a distinct Islamic conceptual perspective in medical sciences and medical practice. The need to reform medicine using Islamic principles was still an intellectual challenge 15 years later[4]. This continuing intellectual restlessness and curiosity led me to the field of Islamization of knowledge and the development of an Islamic epistemology.

Islamization Of Knowledge: A Project Of Epistemological Reform

Crisis of knowledge:

I spent the period 1982-1994 working on various projects of Islamization of Knowledge as a strategy to resolve the ummatic crisis of knowledge. I discussed the crisis in a series of papers even as recent as 2007[5, 6]. There was a dichotomy in the education system: traditional Islamic vs. imported European. There was a dichotomy in the sources of knowledge, *ulum al din* vs *ulum al dunia*. Students could not deal with the contradictory world views presented to them and ended up confused. This resulted in the elite of the *ummah* having a split-mind neither traditional Muslim nor European. This confusion resulted in intellectual weakness with inability to analyze and solve the problems of the *ummah*. The crisis also explained why after many years of sending students overseas to acquire knowledge, the *ummah* was still dependent on others in the fields of science and technology. Motivation for innovation in science and technology cannot occur in the presence of intellectual confusion about basic issues like identity. After years of involvement with the issue of the crisis of knowledge, I reached a working definition of Islamization of knowledge as well as a practical strategy for achieving it. I believed then as I continue to believe today that the Islamization strategy could effectively resolve the crisis of knowledge both in medicine and other disciplines.

The concept of Islamization of knowledge:

Islamization was a process of recasting the corpus of human knowledge to conform to the basic tenets of '*aqidat al tawhid*. The process of Islamization did not call for re-invention of the wheel of knowledge but called for reform, correction, and re-orientation. It was evolutionary and not revolutionary. It was corrective and reformative. It was the first step in the Islamization and reform of the education system[7] as a prelude to Islamization and reform of society[8]. Islamization had to start with reforming the epistemology and methodology of each discipline in a pro-active, academic, methodological, objective, and practical strategy. Its vision was objective, universal, and beneficial knowledge in the context of a harmonious interaction of humans with their physical, social, and spiritual environment.

Immediate goals of the Islamization strategy:

The Islamization strategy had six goals. The first goal was purging from existing disciplines of paradigms and concepts that reflected parochial world views in order to achieve universal objectivity. The second goal was reconstruction of the paradigms using universal Islamic guidelines. The third goal was re-classifying disciplines to reflect universal *tawhidi* values. The fourth goal was reforming research methodology to become objective, purposeful, and comprehensive.

The fifth goal was generation of new knowledge by research. The sixth step was inculcating morally correct application of knowledge.

Dissemination of the Islamization strategy:

I presented papers clarifying basic epistemological issues from an Islamic perspective such as the nature of knowledge[9,10], the history of human knowledge[11], the philosophy of knowledge[12], the methodology of knowledge[13], the Islamic perspective of knowledge[14], and development of a scientific culture[15]. It was clear to me from the beginning that Islamization of medicine was not about content because content changed quickly with on-going research. Islamization had to address basic conceptual issues in the methodology of research. I therefore presented a paper in September 1996 in which I explained conceptual problems in contemporary research methodology and an Islamic approach to methodological reform[16]. In the same direction I presented papers critiquing the empirical methodology not in its practical essence but its underlying often unstated philosophical assumptions and biases in data interpretation[17-19].

Islamization of medicine:

The decision to focus Islamization efforts on medicine was not easy because the conventional wisdom gave priority to the social and human sciences. I had never been comfortable with the notion that priority of Islamization was in the social sciences on the basis that had underlying paradigms that contradicted *tawhid* and that they had a bigger impact on society. I realized that the first assertion was not true since natural sciences including medicine were far from being value-neutral or culture-neutral. I also realized that the second assertion was untrue because all major social changes had medical or engineering innovations as catalysts. I wrote a paper on the impact of the oral contraceptive pill on society and family starting in 1960 to prove the point. I therefore started looking at the work of Islamization of medicine as a model for other disciplines of knowledge[20].

Towards an Islamic epistemology:

I devoted attention to the concept of integration which was the essence of epistemological reform since it would marry Islamic values and science. The paradigm of *tawhid* underlay all integration efforts[21]. An integrated medical curriculum had to have Islamic values embedded[22] in it. Integrated medical practice required integrated medical education[23] because physicians trained in an integrated curriculum were likely to practice integrated medicine. As I progressed further in the evolving concept of integrating Islamic values in medicine, it became clear to me that we would not move forward unless we developed an Islamic epistemology[24] and that more theoretical work on Islamic epistemology needed to be

carried out. I presented several papers on research priorities in epistemology and thought[25-28]. The interdisciplinary nature of medicine led me to present papers on epistemological issues in other disciplines[29-32] as well as reform those disciplines within the Islamization paradigm[33-36]. These ideas were disseminated at several seminars of non-medical nature out of the realization that Islamization of medicine could not be carried out in isolation[37-40].

Definition Of Islamic Medicine

1-Muslim vs Islamic medicine:

After clarifying Islamization and related epistemological issues, I addressed the definition of Islamic medicine. This was needed to counter strong tendencies towards regarding the Islamization of medicine as a return to traditional Muslim medicine practiced centuries earlier. My conviction was that we were dealing with Islamizing scientific medicine and not doing away with it. In July 1995, I presented a paper at a conference in Kuala Lumpur on my concept of Islamic medicine[41]. The paper continued to generate interest even 10 years later and was represented at various forums after that, for example in Indonesia[42] and was published at least two times[43-44]. I started by clarifying the semantic confusion between the adjectives 'Islamic' and 'Muslim'. I explained that 'Islamic' refers to values, ideas, guiding principles, and application of the Qur'an and 'Muslim' refers to people who self-identify as Muslims as well as their activities and institutions. They may not follow all the teachings of Islam. Thus Islamic medicine, the ideal, is not the same as Medicine of Muslim societies, which is the actual historical or contemporary experience of Muslim societies.

2- Islamic medicine as concepts and paradigms:

I then defined Islamic Medicine as Medicine whose basic paradigms, concepts, values, and procedures conform to or do not contradict the Qur'an and *Sunnah*. I emphasized that Islamic medicine was not related to specific medical procedures or therapeutic agents used at a particular place or a particular time. Islamic medicine was universal, all - embracing, flexible, and allowed for growth and development of various methods of investigating and treating diseases within the frame-work described above. I concluded that this definition called for basic transformation of medical systems. Islamic medicine thus would become the result of an Islamic critique and reformulation of the basic paradigms, research methodology, teaching, and practice of medicine. This process of conceptual transformation is also called Islamization of medicine. I revisited the issue of the role of Qur'an and sunnah in medicine in several presentations because of its importance[45-46].

Definition Of Prophetic Medicine

The next task was to address the

tendency towards confining Islamic medicine to Prophetic medicine and thus making it unnecessary to Islamize modern scientific medicine. I addressed the issue of Prophetic medicine in several papers in South Africa[47] Malaysia[48], and Indonesia[49]. The general grain of my arguments was that Prophetic medicine was valid and effective, since prophetic pronouncements and practices were revelation, but that new research was needed to characterize efficacy, dosage, indications, and contraindications of herbal remedies today because of changes in the people, the herbs used, and disease pathology. Language changes had also to be taken into account because a word used for a herb or a disease centuries ago may not have the same meaning today. I also argued that Prophetic medicine did not cover all medical conditions and diseases since it was limited by its spatio-temporal context. These efforts succeeded in diverting attention from Islamization of scientific medicine to confining understanding of Islamic medicine to the historical forms of Prophetic medicine. The modern use of concepts from Prophetic medicine after new research was explored in several fields for example in primary health care[50]. After deliberating Prophetic medicine for over 10 years I realized that what is defined as Prophetic medicine was only a small portion of *hadiths* relating to medicine. There were many *hadiths* of medical significance that were not recognized by our ancestors because the medical knowledge available at their time could not enable them identify the medical significance of all *hadiths*. I therefore started making a new collection of *hadiths* with view to expanding the definition of Prophetic medicine[51-52].

Philosophy Of Islamic Medical Education

The philosophy of Islamic medical education was presented at a conference organized by the Islamic Medical Association of Malaysia at Khota Bharu in Kelantan in June 1996 in a paper titled 'Concepts of Islamic medical education'[53]. The contents of the paper with improvements were presented subsequently at later forums[54-57]. I presented 6 problems or issues in contemporary medical education and explained how an Islamic Input curriculum would address them. The 6 conceptual issues were the purpose of medicine, integration of the curriculum, the service vocation in medicine, physician leadership role, medical research as *ijtihad*, and physician motivation. The **purpose** of medicine, which defines the system of medical education, was to maintain or improve the quality of life and not to prevent or postpone death. **Integration** of the curriculum, deriving from the *tauhidi* paradigm, implied practice and teaching of medicine as a total holistic approach to the human in the social, psychological, material, & spiritual dimensions and not exclusively dealing with particular diseases or organs.

The selection of medical students, their training, and evaluation should emphasize that medicine is a **human service** within the context of Islamic mutual social support, *takaful ijtima'i.* The physician must provide **leadership** as a social activist who identifies and resolves underlying social causes of ill-health; as a respected opinion leader whose moral values & attitudes are a model for others; and as an advisor on medical, legal, and ethical issues associated with modern medical technology so that the patients and their families can reach an informed decision. The future physician must be prepared to undertake **research,** a type of *ijtihad*, to extend the frontiers of medical knowledge, applying available knowledge and improving the quality of life. Time allocated to basic research methodological tools should be increased at the expense of accumulating biomedical scientific information that is either forgotten or becomes obsolete by the time of graduation. The education and development of the physician before, during, and after medical school should inculcate the **motivation** to excel in commitment, *ikhlas*, and care delivery following the model of the early Muslim scientists and physicians.

Implementation Of The Islamic Input In The Medical Curriculum (IIMC)

1- Preparation of the curriculum:

I realized that the process of Islamization of medicine could only be achieved by training future doctors. In October 2005, I joined the newly formed Kulliyah of Medicine in the International Islamic University Malaysia with the determination to put the views of medicine developed over the years in the medical curriculum. A draft curriculum was prepared and was approved by the University Senate. Some lecturers from the faculty of Islamic studies were not comfortable with physicians treading on their territory and teaching Islam. To overcome skepticism then prevailing, actual teaching material with Qur'anic and *hadith* sources was bound in a volume and was presented to the Senate. The basic outline of the curriculum remained the same but changes were made whenever curriculum reviews were carried out. The newly founded Faculty of Medicine at the International Islamic University situated at Kuantan on the East Coast of Malaysia had the distinction to the best of my knowledge of being the first faculty in the Muslim world to formally teach IIMC.

2- Start of Implementation:

Medicine with embedded Islamic values was taught at Kuantan from July 1997 to date. Credit for the success of the implementation belongs solely to Professor Tahir Azhar, the founding dean of the Kulliyah of Medicine, who wholly believed in a new and untried approach and gave consistent unwavering support over a whole decade. The implementation was made easier by the fact that we were dealing with a new medical school. We therefore

could afford to focus on developing detailed teaching material for the first year only. We prepared more material as students moved on to the second, third, fourth, and fifth years.

3-Integration:

The main motive of IIMC was integration to resolve the crisis of duality or dichotomy manifesting as teaching of Islamic sciences separate from that of medical disciplines with different teachers and from different institutions. IIMC resolved the crisis of duality by insisting that Islamic concepts should be taught by the same people who teach medical disciplines. This required specific training of those lecturers to be able to handle the Islamic Input. IIMC besides integrating the teacher and study material, also integrated the examinations. Questions on IIMC were embedded in all examinations of the Kulliyah. IIMC also achieved integration of theory with practice with students being taught in a practical way how a patient can perform acts of 'ibadat. The Department of Orthopedics was the most successful in this endeavour.

4-Joint reading of 2 books:

IIMC followed the Islamic paradigm of reading 2 books: the book of revelation, *kitab al wahy*, and the book of empirical science, *kitab al kawn*. Both books contain signs of Allah, *ayatullah*, and must be read together. It is a mistake to read one of the books and neglect the other. The solution to the crisis of duality in the ummah starts from joint reading of the 2 books, *al jam'u baina al qira'atain*. Thus medical scientists who are involved in IIMC read the signs in both books contemporaneously.

5-Two components of IIMC:

IIMC had two separate but closely related components: Islamization and legal medicine. Islamization dealt with putting medicine in an Islamic context in terms of epistemology, values, and attitudes. Legal medicine deals with issues of application of the Law (*fiqh*) from a medical perspective.

6-Five objectives of IIMC:

The 5 main objectives of IIMC were: (a) introduction of Islamic paradigms and concepts in general as they relate to medicine, *mafahiim Islamiyah fi al Tibb*. (b) Strengthening faith, *iman,* through study of Allah's sign in the human body (c) appreciating and understanding the juridical, *fiqh*, aspects of health and disease, *al fiqh al tibbi*. (d) Understanding the social issues in medical practice and research and (e) Professional etiquette, *adab al tabiib,* from the Islamic perspective.

7-Teaching material of IIMC:

All through the past 13 years I worked on the teaching materials for IIMC that would eventually be published as a textbook. I shared the materials with other medical educators either directly or through the internet. The reluctance to print the materials was due to the desire to get the full benefit

of feedback from actual teaching of IIMC and this in hindsight proved a very prudent measure to take because many major revisions had to be made. IIMC being an innovative product that still needed to be accepted should be presented in a textbook that has been tried out and improved as much as possible. At the start the IIMC manual was titled '*Muqaddimat al tibb*: an Islamic introduction to the study of medicine'. In 2006 the title was changed to '*Muqaddimat al 'uluum:* Islamic introduction to the study of sciences' after realizing that the manual, like the study of medicine, was interdisciplinary covering basic biological and physical sciences, health sciences, and social sciences. A synopsis of the manual is available at http://omarkasule.tripod.com). A major revision is envisaged by the end of 2009. The manual is a series of 18 manuscripts arranged in 5 main themes: Theme One: *Asasiyyat* (Fundamentals) 1: *'aqidah* (creed); 2: *usul al shari'ah* (foundations of the law); 3. *'ilm and ma'arifah* (epistemology); 4. *khalq* (creation / cosmogony); 5. *tarikh al umam* (world history); 6. *tarikh al ummah* (Muslim history); 7. *al tajdid* and *al islah* (renewal and reform); Theme 2: *Fiqh Al Ulum Al Tibiyyah*, (Basic Medical Sciences): 8. *'ilm al hayat* (the science of life); 9. *jism al insan* (the organism: structure and function); 10. *fiqh al 'adat* (activities of daily living); Theme Three: *Fiqh Al Tibabah* (Clinical Sciences): 11. *Akhlaq Al Tibb* (Ethics Of Medicine); 12. *Fiqh Al Amradh* (Disease Conditions); 13: *Fiqh Mustajiddat Al Tibb* (Modern Medicine); Theme Four: Fiqh Al *Jama'ah* (The Community): 14. *Arkan Wa Humum Al Jama'ah* (Institutions And Concerns Of The Community); 15. *Fiqh Al Mu'amalat* (Transactions); Theme Five: Personal Skills: 16. Al *Takwin Al Asasi* (Basic Formation): 17.: *Qiyadah*(Leadership); 18. *Idarah* (Management)

8-Evaluation of IIMC:

After graduating 5 batches of students we wanted to make an evaluation of the products of the curriculum. A concept paper was prepared[58] but the actual data collection proved elusive until today. A research project was carried out on ethico-legal knowledge by students at UIA[59] and the results will be published subsequently.

9-Implementation of IIMC at the postgraduate level:

After 10 years of teaching undergraduates (1997-2007) a start was made in exploring Islamization at the postgraduate level in the field of epidemiology. A course was taught in 2007 successfully with an Islamic epistemological introduction[60].

10-Implementation of IIMC at other schools of medicine

The start was a year-long course on IIMC for lecturers at the University of Malaya in 2002. Then a modified form of IIMC was adopted by the newly founded medical school at the Islamic University of Science in

Malaysia starting in 2004. They took the matter seriously by appointing the most experienced IIMC lecturer from Kuantan, Associate Professor Dr Ariff Othman, as their consultant on curriculum development. In late 2004 a lecturer, Dr Sagiran, from the faculty of medicine Muhammadiyah University in Jogjakarta visited Kuantan and spent 1-2 weeks studying the implementation of IIMC. As a result of his visit, In August 2005 a week-long training workshop was held at the school of medicine of the Muhammadiyah University in Jogjakarta, Indonesia. I explained the concepts and methods of IIMC and provided teaching materials. Implementation of IIMC then started but there were difficulties that had to be ironed out subsequently. The curriculum has also had an impact on 16 faculties of medicine in Indonesia that integrated Islamic values in their medical curricula and are members of the FOKI network (Indonesian acronym for Islamic Medical Forum). I attended meetings of FOKI on a regular basis and also visited campuses of its member faculties. I have presented IIMC at medical faculties in Nigeria, Bangladesh, and Yaman with good response. Follow up will be needed before IIMC can also be adopted in actual teaching.

Training Lecturers of The Curriculum

1-Lecturer training at Kuantan

I realized quite early that the curriculum would not succeed unless there were medical lecturers trained and confident in its delivery. At the Kulliyah (College) of Medicine the training process was very hands-on. In the first academic year 1997-1998 I gave all the lectures while other lecturers sat in the class. In subsequent years I started assigning specific lecturers to teach specific topics. I made sure that I gave the lecturers as much support as possible in providing teaching material or discussing the sessions before they appeared in front of the class. I also encouraged them to be innovative and not follow what I had provided. They did very well and in the period of 8 years I came to learn a lot from their efforts and I transferred the knowledge acquired to others. The process of empowering the lecturers was so successful that by the 2004-2005 academic years I was just a consultant with almost all lectures being taught by others. At the end of that year I made the decision to leave the Kulliyah of Medicine at Kuantan because my mission was complete and I needed to transfer my efforts elsewhere. I accepted the invitation to the chair of Islamic medicine at the University of Brunei Darussalam. I however returned from time to time to follow up the work at Kuantan and taught some classes to get a feel of how IIMC was performing[61-73].

2-Lecturer training at other schools of medicine

I also turned my attention to train lecturers at other universities. In the course of one academic year 2002-2003 I held workshops for lecturers

at the Faculty of Medicine University of Malaya on various topics: the Islamic creed[74], the Islamic definition of life and health[75], fundamentals of the Islamic Law[76], medical jurisprudence[77-78], and jurisprudence relating to biotechnology[79-80]. A new series on bioethics training was planned for 2009[81]. Lecturers were also trained in Indonesia[82].

Dissemination Of The Curriculum

1-Dissemination of IIMC by internet:

It was a strategy adopted at the beginning to make sure that all what I wrote on IIMC was available. I therefore, at every opportunity available to me, wrote up my presentation as a full length paper with references from the Qur'an and *Sunnah*. All lectures on IIMC delivered were also written up. A total of 1067 papers and lectures were published at the Islamic Medical Education Resources website (http://omarkasule.tripod.com) in the period 1995-2007. The papers have also been loaded at many websites many of which are unknown to me. In order to disseminate the knowledge on a wider scale I allowed republication of my papers in several media.

2-Book publication

Papers on IIMC have been published as books in Bangladesh[83] and Indonesia[84-85]. Other collections are in the process of being published.

3-Lectures, workshops, and conferences:

The UIA experience was shared in papers at many conferences and seminars in Malaysia[86-88], Indonesia[89-90], and Bangladesh[91-92]. We shared our approach with other medical educators[93-94]. I presented the new curriculum to medical audiences but also to non-medical audiences[95] because Islamization was a theme for all disciplines of knowledge. I was also interested in values that also run throughout all the sciences[96]. By the summer of 2007 I had decided to embark on a new initiative in Yaman of working to help faculties of medicine improve their curricula[97], teaching[98], student assessment[99], management[100-101], and quality[102-103] in addition to adopting the Islamic Input curriculum[104]. Towards the end of 2007 my thoughts were turning to the idea of starting new medical schools that would use the IIMC *de novo*. I had discussions with people trying to set up such schools in Kuwait and Saudi Arabia[105].

It was also clear to me that change would have to involve all health professionals and not only physicians. I therefore presented papers on the nursing perspective: history of nursing in Islam[106], challenges to the nursing profession in the Muslim world[107], issues in nursing education[108], motivation in the nursing profession[109], and professional conduct of a nurse[110]. Towards the end of 2007 I started a series of workshops on medical ethics for nurses[111].

Traditional *ulama* were an authority in

Muslim societies and any viable change must have their approval or at least neutrality. I started by studying patterns of medical fatwas issues in Brunei[112] and other countries to understand the mind set of the *ulama*. It was with that in mind that I embarked on an experiment of presenting ethico-legal concepts that I developed to the ulama starting with India. I held workshops in various Indian cities: Hyderabad[113-114], Azamghar[115-122], Lucknow[123-127], and Patna[128-133].

Further Theoretical Developments In The Main Themes Of IIMC

1-Integrating Islamic values in the medical profession:

I talked about the Islamic perspective of medicine[134]. I also talked about integrating Islamic values in the medical curriculum[135-138] and medical practice[139-140]. The paradigm of *tawhid* underlay all integration concepts.

2-Islamic concepts relating to basic sciences:

The realization that atheistic values were disseminated in teaching basic medical sciences prompted me to address several issues relating to basic medical sciences from an Islamic perspective. Among the issues addressed were: creation of the earth[141], creation of the human[142], human creation vs human evolution[143-144], the biological miracle of human creation[145]. I also addressed issues of treatment modalities in Islam including prayer and spirituality and spiritual approaches to treatment[146]. Also addressed were psychological aspects such as treatment of anxiety from an Islamic perspective[147]. Basic sciences were also addressed such as teaching probability from an Islamic perspective[148]. In 2004 I presented a paper on the balance between originality and modernity in medical jurisprudence[149]. The paper provided a conceptual context for dealing with matters like understanding spiritual needs of patients[150] in relation to modern forms of medical therapy.

3-Islamic perspective of ethico-legal issues:

The issue of ethics engaged my attention because it would show the immediate utility of the curriculum by teaching shariah-based methods of resolving practical problems in medical care. Using the tools of *maqasid al Shari'ah, qawai'd al Shari'ah* and where available texts, from the Qur'an and *Sunnah*. I addressed most of the contemporary ethico-legal issues and provided a conceptual basis for resolving ethical issues in medical decisions[151]. I addressed the issues of changes in medical jurisprudence that required use of *maqasid al Shari'ah* in the modern era. I then worked on a major paper in which I formulated a derivation of medical ethics from *maqasd al Shari'ah* and presented it in 2004 at a scientific meeting of the Federation of Islamic Medical Associations in Amman in July 2004[152]. The paper was subsequently published[153]. It was presented at various forums in Malaysia[154-155],

Nigeria[156-157], Indonesia[158], Kuala Lumpur[159], and the UK[160]. A companion paper on research ethics based on *maqasid al Shari'ah* was presented at the same conference[161]. The paper was presented in a modified form in Indonesia[162]. A comparative study of Islamic and European ethical theories and principles reached the conclusion that the Islamic approach was more robust, more practical, and more consistent[163]. Several papers on ethics from *maqasid al Shari'ah* were presented in the UK[164], Indonesia[165], Bangladesh[166], India[167], Malaysia[168], Kuala Lumpur[169], Turkey[170], and Yaman[171]. I then addressed specific issues: Progeny[172-173], Assisted Reproduction[174], Euthanasia[175], Contraception[176-177], Human Research [178], Suicide [179-180], Public Health Research [181], Embalming, Cryopreservation, Autopsy, and Research on Dead Corpses [182], Protection, Preservation, and Promotion of the Intellect [183], Sexual Crimes [184-185], Midwifery[186-187], *sawm* with Diabetes Mellitus [188], Health benefits of *sawm* [189-191].

4-The Islamic perspective of public health and health services delivery:

The following concepts in public health and services delivery were discussed from an Islamic perspective: moderation, balance, and just equilibrium in preventive medicine based on the Qur'anic concepts of *wasatiyyah, mizan,* & *itidal*[192], medical quality improvement[193-194], medical service delivery[195-196], benchmarking in Islamic hospital practice [197], medical management[198], leadership and management[199], a critique of the biomedical model from an Islamic perspective[200], and contrasting holistic medicine against practice based only on biomedicine[201].

5-Islamic perspectives of physician etiquette:

The following concepts were discussed from the Islamic perspective: physician human relations[202], concept of physician etiquette[201], physician etiquette with patients and families [203], physician etiquette with the dying [205], physician etiquette in the health care team[206], care for the terminally and the death process[207-208].

6-Professionalism:

I presented the following papers on professionalism: motivated physician [209], professionalism[210-211], being a Muslim doctor[212-213], physician leadership[214], community involvement[215-216], commitment [217], spiritual development[218], training [219], definition of Muslim doctor [220], towards a motivated medical student [221], leadership attributes and skills[222-223], and character building[224].

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Inculcating Islamic Input in the Curricula of Medical Sciences at Pre-clinical years (basic medical sciences)

Tayyab Hassan and Hamdan Noor*

Abstract:

In the pre-clinical years of medical education, the inculcation of a sound educational attitude is crucial for optimal student education with emphasis on basic knowledge, skills, as well as insights into nature of disease and the health process.

Since the eighteenth century, the Western biomedical model of health and healing, which adopts the concept of technical aspects of healing, has been the backbone of medical education and patient care.

This concept, however, was challenged by a wealth of literature that recognized the role of spirituality as a significant aspect of healing and perception of the meanings of illness, sorrow, happiness, life and end of life issues.

Publications addressing the issue of spirituality and healthcare, came up from various cultures and the concept was adopted by increasing numbers of medical schools in various countries all over the world.

The Islamic input in medical education provides both professionalism, with divine injunctions of perfection and competence, together with a holistic approach towards patients, family, society, disease, health, life and death.

Unlike the Western biomedical model, in the Islamic holistic approach, Allah (SWT) is the ultimate source of healing. Medical professionals are only means of healing as transferred to them by the Creator.

Moreover, this holistic concept adopts prevention and proper lifestyle and behavior in addition to therapeutic modalities. It integrates both Islamic values with maximum exposure to innovations of modern medicine.

This approach should be inculcated in medial curriculum in Islamic medical colleges from the first year of training.

Keywords: *Medical education, educational attitude, spirituality, Islamic values.*

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Introduction:

The first issue is to understand the difference between pre-clinical and clinical years. As we know there is no direct contact with the patient in pre-clinical years though spiral and integrated curriculum introduces clinical topics to the students. In clinical years the most important part is direct contact with the patient and more comprehensive clinical subjects. This distinction of topic areas and patient contact clearly divides pre-clinical and clinical years into two separate systems of teaching and learning, inspite of having a horizontally and vertically integrated curriculum.

Institutions provide educational programs and resources to their students but they can not inculcate knowledge and skill in them. It is the `educational attitude` of students that provides a source to transform these programs and resources into required knowledge and skills. Knowledge and skills can be used to provide good patient care but again having required knowledge and skills alone is not enough to provide patient care. A student must have proper `professional attitude` to use his knowledge and skills for patient care. As mentioned earlier, there is no patient contact in pre-clinical years, so professional attitude is not important in those years but educational attitude is the most important and mandatory component to gain knowledge and skills. In clinical years, with patient contact, professional attitude is the most required component in addition to the educational attitude [(1)]. This argument may help in deciding the content of pre-clinical and clinical years' curriculum. Pre-clinical years should stress more on basic knowledge and skills; insight into the nature of disease, health and healing process; and the role of the health care provider. Clinical years should stress on professionalism, disease patterns and patient management.

Proper attitude, is mandatory to gain maximum benefit from education. In order to identify and inculcate this appropriate attitude some divine guidance is essential. Besides, `*Istiqamah*` i.e. steadfastness is another quality required and it is in fact more important than just inculcating the right attitude. Inculcation of Islamic input is vital in achieving both the divine guidance and the *Istiqamah*. Introducing Islamic input in pre-clinical years will make students realize these issues from the very beginning of their training.

Philosophy of Modern Medicine:

Rene Descartes, a 17th century philosopher described the philosophy of modern medicine. He stated that all the systems in this world operate under mechanical laws and that there is no meaning or purpose related to these laws[(2)]. This philosophy gave a biomedical model of health and healing, practiced widely in the Western world. Current medical education system is also based on this biomedical model [(3)]. Health professionals are trained to be

very objective and instead of a caring healer, they work like scientists.

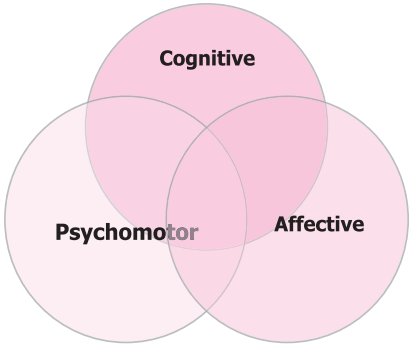


Figure 1: Three Domains of Education

This biomedical model and the scientific and medical advances during last 3 decades have given the technical aspects of healing to our medical education system. Disease is considered as an imbalance of normal physiology and treatment is based on the restoration of body systems to a normal state. But it is evident that *healing* involves some other aspects as well. Disease disrupts normal life pattern and people start thinking about their career, family, meaning of life and happiness [4]. The importance of attitude and behavior has recently been realized and an affective component was included as an important domain of education as shown in Fig. 1, but still some aspects of healing are missing and need modification of philosophy of modern medicine.

What is missing?

If the current curriculum of pre-clinical years is good enough to provide required knowledge, skills and attitude to the students with understanding of disease and healing process, then what is missing? Literature shows that spirituality has been recognized as an important aspect of the healing process and efforts have been made to include spirituality in the medical education curriculum (See Appendix A).

All cultures and societies describe the concept of spirituality. Spirituality is concerned with the search for meaning of different life events especially illness and sorrows through religion or belief in God, family, humanism, etc.

An increasing number of medical schools are offering courses in spirituality in medicine. It increased from 17 out of 126 accredited US medical schools in 1994 [5] to 84 schools in 2004 [6]. The Association of American Medical Colleges also recognized spirituality in Medical School Objectives Report III released in 1993 as a factor that contributes to health.

In his book *"Timeless Healing"*, Benson describes various studies that show the beneficial effects of religion. The studies done on the effect of religion on reduction in alcohol consumption, reduction in nicotine use and drug use, decrease in depression, reduction in blood pressure, reduction in anxiety and improvement in quality of life [7]. Dr. Dossey, in his book *"Healing Words"*, describes an experiment done in 1988 at San Francisco General Hospital. The experiment was done on prayer and healing. The researchers divided 293 critically ill patients in the coronary care unit into 2 groups.

Group A: Patients, prayed for by name by prayer makers.

Group B: Patients not prayed for.

The results showed fewer complications and less congestive heart failure, less antibiotic usage, less cardiac arrest and earlier discharge from hospital in group A patients as compared to group B patients. Prayer makers were not advised for any specific prayer. In fact most of them used simple words i.e. "Lord have mercy on this patient [7].

In a recent article published in "The Lancet", in 2003, researchers studied the effect of spirituality in terminally ill patients. Patients with terminal cancer who were expected to live less than 3 months were selected. Their understanding of the meaning of life and religion and their behavior toward the illness was evaluated. The researchers concluded that spirituality helped these patients to cope much better by avoiding despair and willingness to die as compared to the control group without spirituality.

Some researchers have recommended that "health care providers should incorporate psychological and spiritual elements into the palliative care of dying patients"[8].

The impact of religious belief and practices on both physical and emotional health has been widely accepted in the last few decades. Scientific research has demonstrated the effect of spirituality in the prevention and treatment of emotional disorders, disease and injury and in enhancing recovery [9]. Various renowned universities around the world have already incorporated spirituality as an important component of their curriculum (See Appendix A).

What is spirituality?

Spirituality is considered to influence the perception of health and disease and their interaction with one another both by the patients and health professionals.

Researchers recommend making a clear distinction between the terms "spirituality" and "religion." They emphasize the need to have a universal definition of spirituality acceptable to all religions that includes both religious and nonreligious perspectives[10-15]. For practical purposes, spirituality can be defined as `divine guidance` to search for the meaning of life and its events. Divine guidance comes through some source. Holy Books revealed to mankind and the messengers of God provide good source of divine guidance.

Why inculcate the Islamic input?

The last revealed Holy Book is the *Qur'an*, the book of Islam. The *Qur'an* commands to follow the sayings (*ahadith*') and ways (*Sunnah*') of Prophet Muhammad (PBUH). Thus the *Qur'an* and the *Sunnah*' are the ultimate sources of divine guidance and because they are sent to Muslims, this guidance or spirituality can be achieved by inculcating the *Qur'an* and the *Sunnah*' in the curriculum.

Why is the *Qur'an* chosen for this purpose? The reason is that the *Qur'an*

is the last revealed book from God and it verifies all the previous revealed Holy Books So it is very logical to quote from the latest edition of a book instead of some old edition as it covers all the previous books and hence gives a holistic approach to spirituality.

In the Qur'an it is stated :`

"And this is a blessed scripture which We have revealed, confirming that which (was revealed) before it, that you may warn the Mother of Villages and those around it. Those who believe in the Hereafter believe herein, and they are careful of their worship" (16)

*`And this Quran is not such as could ever be invented in despite of Allah; but it is a confirmation of that which was before it and an exposition of that which is decreed for mankind - Therein is no doubt - from the Lord of the Worlds.* ` (17).

It can be concluded that spirituality and religion are not necessarily different as shown in the equation below:

Spirituality = Divine Guidance = Religion OR

Spirituality = Religion

As mentioned earlier, Islamic input will provide appropriate attitude and *Istiqamah*. In addition to this, the inculcation of Islamic input will also help students to understand their role and to identify appropriate behavior expected in the healing process. The *Qur'an* states:

"Now when hurt touches a man he cries unto Us, and afterward when We have granted him a boon from Us, he saith: only by force of knowledge I obtained it. Nay, but it is a test. But most of them know not." (18)

Current affective domain models mainly cover those aspects that are concerned with dealing with the patient or in other words professionalism. Islamic input covers all these aspects related to the professionalism and in addition provides a holistic approach to the patient, his family, his understanding of disease and healing process and above all, the value of divinity. This holistic approach brings doctor and patient close to God and helps them in making decisions and accepting outcomes.

The philosophy of Islamic Medicine:

Before inculcating the Islamic input it is wise to understand the philosophy of Islamic medicine to appreciate the difference between Modern medicine and Islamic medicine and to establish whether there are any major differences between the two. Islam gives guidance for all aspects of human life including personal affairs, social, political, financial, marital, religious, health and illness issues, etc. Careful analysis of the Qur'anic verses provides divine guidance related to the philosophy of medicine and this will further help us to decide which is the better philosophical approach to medicine.

Islamic medicine as described in the *Qur'an* has two components:

1. Physical component and
2. Spiritual component.

The physical component is described by

mentioning items like honey and plants as a medium of healing,

"Then eat of all fruits, and follow the ways of your Lord, made smooth (for you). There comes forth from their bellies a drink divers of hues, wherein is healing for mankind. Lo! herein is indeed a portent for people who reflect". (19).

"Then We cast him on a desert shore while he was sick; and We caused a tree of gourd to grow above him." (20) .

The spiritual component is described by mentioning the Qur'an as a medium of healing,

"We send down (stage by stage) in the Qur'an that which is a healing and a mercy to those who believe... "(21)

"O mankind! There has come unto you an exhortation from your Lord, a balm for that which is in the breasts, a guidance and a mercy for believers." (22)

This same philosophy was also acknowledged by the Prophet Ibrahim, *"and when I am ill, it is He who cures me"* (23)

God Himself attests to it by saying

"If God touches you with an affliction, no one can remove it but He" (24).

"And verily, if you should ask them: who created the heavens and the earth? they will say: Allah. Say: think you then of those you worship beside Allah, if Allah willed some hurt for me, could they remove from me His hurt; or if He willed some mercy for me, could they restrain His mercy? Say: Allah is my all. In Him do (all) the trusting put their trust." (25)

God has also described the way to get relief from sufferings,

"And your Lord has said: pray unto Me and I will hear your prayer. Lo! those who scorn My service, they will enter hell, disgraced." (26)

The *Qur'an* categorizes the causes of diseases into physical, evils, magical and psychological causes.

"Say: I seek refuge in the Lord of the daybreak: from the evil of that which He created; from the evil of the darkness when it is intense, and from the evil of malignant witchcraft, and from the evil of the envier when he envies." (27)

The Qur'an also describes the basic philosophy of illness,

"Who so does right it is for his soul, and who so does wrong it is against it. And your Lord is not at all a tyrant to His slaves"(28)

"Whatever of misfortune strikes you; it is what your right hands have earned. And He forgives much. " (29).

These verses clearly suggest that certain deeds of man cause illness and suffering and thus the Qur'an highlights the role of preventive medicine because if man knows that certain acts of him can cause illness he can try to avoid those acts and can prevent illness as well.

The Qur'an also describes the basic mechanism which leads to illness i.e. all excesses.

"Know that the life of this world is only play, and idle talk, and pageantry, and boasting among you and rivalry in respect

of wealth and children; as the likeness of vegetation after rain, whereof the growth is pleasing to the husbandman, but afterward it dries up and you see it turning yellow, then it becometh straw. And in the Hereafter there is grievous punishment, and (also) forgiveness from Allah and His good pleasure, whereas the life of the world is but matter of illusion." [30]

It can be concluded that God is the ultimate source of healing but this healing is transferred to man by using some medium that may be physical or spiritual. Disease and illness may result from misdeeds of man. The philosophy of Islamic medicine clearly stress on prevention by improving the way of living in all aspects of human life. In other words the Islamic philosophy emphasizes a holistic approach to health and living.

Role of health care providers:

Previous and subsequent discussions will help us in identifying that the Islamic philosophy of medicine is not something totally new or different from the current practices of medicine. Many of these are not against the norms currently practiced. All civilized cultures, regardless of their religion, recommend certain acceptable and noble attitudes and behaviors; Islam only intensifies and completes those attitudes and behaviors in a more coherent way that is the basis of its holistic nature.

God describes human life as an important issue,

`For that cause We decreed for the Children of Israel that who so ever kills a human being for other than manslaughter or corruption in the earth, it shall be as if he had killed all mankind, and who so ever saves the life of one, it shall be as if he had saved the life of all mankind. Our messengers came unto them of old with clear proofs (of Allah's Sovereignty), but afterwards lo! many of them became prodigals in the earth. ' [31]

The first statement drives mankind towards competence and perfection in order to avoid any mistakes or deficiencies and not shoulder the blame of killing the whole of mankind.

Similarly, the second statement provides an enormous motivation to enhance learning and competency to enjoy the feeling of saving the whole of mankind.

This statement can be applied to medical education without any doubt and it gives a very fundamental goal of medical education. This goal can guide trainees towards the right direction in their medical education and can shape their attitude appropriately. Some sayings of the Prophet Muhammad (PBUH) also stress on the quest for excellence in the acquisition of knowledge and skills.

A careful study of the Holy Books shows that God has clearly described the goal of saving life in His revelations. Almost all the major religions of the world accept that both disease and cure comes from Almighty God and doctors can not give cure or life to any one.

The role of a doctor is to transfer the healing given by God to the patient. To

be eligible as His instrument of cure , one needs to be perfect in knowledge related with his selected mode of therapy i.e. contemporary medicine, allopathic, homeopathic, herbal, acupuncture, etc. The doctor ought to strive for maximum knowledge and competence so that he may qualify to be a source of the transference of His cure. God suggests this in the *Qur'an*.

" and say: *My Lord! Increase me in knowledge*." [32]

What is meant by the integration of Islamic and modern medicine?

The most important point here is to make a clear understanding about the integration of Islamic and modern medicine. The three possibilities of integration are as follows:

1. Introducing Islamic philosophy to modern medicine
2. Introducing Islamic methods of healing to modern medicine
3. Introducing the contributions of Muslims to modern medicine

In the first case, there is no need to change the content and subjects of medicine. The only thing that needs to be done is to add some contents regarding the Islamic philosophy and expose students to these concepts. The aim should be to change the thinking of the trainers and trainees so that they clearly understand their role and strive for divine guidance when treating their patients. This is the most difficult process and needs lot of motivation from the trainers and trainees

In the second case, most of the contents and subjects needs to be changed. Students should be taught various Islamic methods of healing and they should learn about the qualities and medicinal effects of various plants (herbs), honey and other natural products to apply to their patients. This is easy but it will change the whole structure of modern medicine.

In the third case, nothing requires to be changed. The only thing is to add some content about the Muslim scholars, especially physicians, to understand their role in modern medicine.

The third option is not related to Islamic input and hence we have only two options to consider. The second option can easily be achieved by improving `Traditional and Complementary Medicine` (TCM) or `Complementary and Alternative Medicine` (CAM).

The first option is the best way of integrating Islamic and modern medicine and poses a great challenge to all Muslim medical scholars.

Training of health care providers - An Islamic perspective:

Referring back to figure 1, the training of health care providers should encompass all the three domains of education i.e. Attitude (Affective domain), Knowledge (Cognitive domain) and skills (Psychomotor domain). How Islamic input may affect these domains is discussed below.

Attitude:

The general attitude for all Muslims, including health providers, is described in the following verse,

"O my dear son! Lo! though it be but the weight of a grain of mustard-seed, and though it be in a rock, or in the heavens, or in the earth, Allah will bring it forth. Lo! Allah is Subtle, Aware of all things. O my dear son! establish worship and enjoin kindness and forbid iniquity, and persevere whatever may befall you. Lo! this is firmness(of purpose) in (the conduct of affairs". Turn not your cheek in scorn toward folk, nor walk with pertness in the land. Lo! Allah loves not each braggart boaster. Be modest in your bearing and subdue your voice. Lo! the harshest of all voices is the voice of the ass."(33)

The *Qur'an* suggests Prophet Muhammad (PBUH) as a role model by attesting,

"And lo! you are of a tremendous character."(34)

Attitude training models can be extracted from the *Qur'an* by analyzing the following verses that describe the stages of explanation, partial restriction and total prohibition for drinking intoxicants.

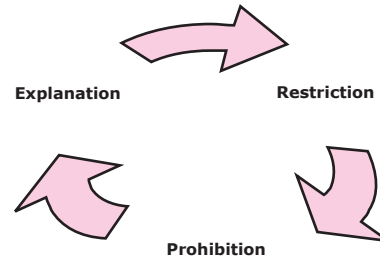
"They question you about intoxicants and games of chance. Say: in both is great sin and (some) utility for men; but the sin of them is greater than their usefulness" (35)

"O you who believe! Draw not near unto prayer when ye are drunken, till you know that which you utter",(36)

-O you who believe! Intoxicants and games of chance and idols and divining arrows are only an infamy of Satan's handiwork. Leave it aside in order that you may succeed.(37)

"Satan seeks only to cast among you enmity and hatred by means of intoxicants and games of chance, and to turn you from remembrance of Allah and from (His) worship. Will you then abstain?" (38)

Qur'anic model of affective domain training



Knowledge:

It is a well known fact that human brain contains 100 billion neurons and 100 trillion neuronal connections and information is stored in these connections. The *Qur'an* described this neuronal model of learning 1400 hundred years ago by mentioning that Adam was taught the names (knowledge) of everything.

`And He taught Adam all the names, then showed them to the angels, saying: inform Me of the names of these, if ye are truthful. ` (39)

In this world, bounded by time and space, we need a source or medium to

get something.

We need external stimuli to activate the information wired in the neuronal connections or synapses in order to get a complete picture of what nature has already imprinted in our brain.

The dot book example shows that if only a few dots are connected, one can not get a complete picture but if all the dots are connected then one can get the full picture. Hence **maximum exposure to information** is necessary in order to get a full understanding of any subject matter.

The brain receives an enormous amount of information but can not process all of them and hence about 99.5% of this information undergoes extinction and only 0.5% becomes available for further processing.

Attention is a process which protects this small amount of information from further extinction and the *Qur'an* described the mechanism of giving attention in the very first verse by asking the illiterate Prophet to read i.e. **to repeat whatever he listens** [40]

The verse reads

*`Read: In the name of thy Lord Who createth.* ` [41]

"Stir not your tongue herewith to hasten it. Lo! upon Us (rests) the putting together thereof and the reading thereof. And when We read it, follow you the reading." [42]

The *Qur'an* also described the mechanism to enhance retention and retrieval of information by mentioning that the pen gives knowledge to man. The function of the pen is writing and this explains that writing is the best way of learning new information. This suggests the **involvement of the motor system in memory and learning processing** [43].

` *He (Allah) who taught by the pen, taught man that which he knew not.* ` [44]

The *Qur'an* also described the **research or inquiry based** learning method[45]. For example the *Qur'an* gives a statement about the human development and leaves the remaining information for us to discover.

`(Allah) Created man from a clot. Read: and your Lord is the Most Bountiful.[46]

Evidence based practice is also evident from the Qur'an.

"And if any tidings, whether of safety or fear, come unto them, they noise it abroad, whereas if they had referred it to the messenger and to such of them as are in authority, those among them who are able to think out the matter would have known it. If it had not been for the grace of Allah upon you and His mercy you would have followed Satan, save a few (of you)." [47]

The role of supervision is also described in the Qur'an,

"And We sent not (as Our messengers) before you other than men whom We inspired - Ask the followers of the Remembrance if ye know not!"[48]

"Musa said unto him: May I follow you, to the end that you may teach me right conduct of that which you have been

taught ?"[49]

Skills:

The *Qur'an* describes **demonstration** as the basic principle of teaching a skill.

"Then Allah sent a raven scratching up the ground, to show him how to hide his brother's naked corpse. He said: woe unto me! am I not able to be as this raven and so hide my brother's naked corpse and he became repentant."[50]

Assessment methods:

Assessment methods may be `Norm-referenced` or `Criterion-referenced`. In `Norm-referenced` assessment, students` abilities are judged against the performance of others and this gives a sense of competition which is considered detrimental for educational environment. On the other hand, in `Criterion-referenced` assessment, students are assessed against some pre-selected criteria i.e. whether they have achieved the required standard or not. Their performance is not related to the performance of others. Competition as a source of motivation is good but if students struggle to perform better than their fellow students then it may affect learning as a group.

The *Qur'an* clearly suggests a **criterion-based assessment** method where candidates are assessed against some pre-set criteria independently and not as compared to the performance Of other students This method avoids a competitive environment and encourages collaborative learning.

"Those are a people who have passed away; theirs is that which they earned and yours that which you earn. And you will not be asked of what they used to do." [51]

There are several assessment methods in use and their selection is based on the content and objectives of the course or program. Islamic input suggests a basic principle of assessment that is criterion-based to encourage students` learning. This may be applied to continuous, formative, summative or any other type of assessment. Assessment tools must comply with this basic requirement. The *Qur'an* also describes continuous formative and summative assessments by mentioning about the record of all our deeds throughout our life and a final grand assessment on the Day of Judgment.

Cyberjaya University College of Medical Sciences (CUCMS) curriculum – Is it an Islamic Curriculum?

The philosophy of CUCMS, **"To harness human potential in a comprehensive manner to produce holistic health care providers who are intellectually-, emotionally- and spiritually-balanced based on the principles of Islam and the obedience to the Almighty Allah"** clearly indicates the intention of providing holistic health care education based on Islamic principles and producing doctors who are intellectually, emotionally and spiritually balanced.

The affective domain in CUCMS is composed of 9 outcomes which students are expected to achieve at the end of their training. Students

are closely observed from the very beginning under the mentorship program to ensure supervised training and assessment of their attitude and behavior. Weekly reflection sessions of small groups of students with their mentors facilitate the development of relationship among students and their teachers. These sessions also help in identifying the right attitudes expected and monitoring of progress in achieving affective domain outcomes. Reflection on academic and non-academic issues provides a holistic perspective to the Affective domain. In addition, students are continuously exposed to various Islamic concepts and behaviors through talks, lectures, community activities and sharing of experiences.

For the Knowledge domain, students are provided access to information through the availability of online resources, library and web portals. Small group teaching is the main teaching method which provides close monitoring of students and identification of weak students to provide remedial measures. Student Centered Team-based Learning (SCTL) method engages students through various activities like drawings and work books completion to enhance their memory and retention. Problem Based Learning (PBL), Clinical Skills Training (CST) and Clinical Correlation (CC) courses provide thinking and problem solving exercises under the supervision of facilitators. Large class sessions provide a portal to convey important topics to the whole class at once to give them better understanding and planning of upcoming small group sessions.

Skills' training is also conducted as a separate course and explanation and demonstration by experts is the main strategy adapted before allowing them to practice individually.

Community and Health Exposure Training (CHET) course, Personal and Professional Development (PPD) course, Military medicine, Disaster and Relief Medicine (DRM), electives for both non-medical and medical subjects and voluntary work under Young Mercy all contribute towards a holistic approach to the patient and the community.

Traditional and Complimentary Medicine (TCM) is another important course to integrate Islamic and other alternative treatment methods into modern medicine.

Introduction to research topics and encouragement to conduct research during electives is also in accordance with the Islamic philosophy.

Criterion based continuous formative and summative assessment is helpful in creating a collaborative learning environment instead of competitive environment.

This bird's eye view analysis of CUCMS curriculum clearly indicates the direction of education towards Islamic philosophy of medicine which is in accordance with the Philosophy of CUCMS as well.

There is still a need to introduce few

more strategies in order to achieve a thorough and complete model Islamic medical curriculum at CUCMS.

Recommendations on Islamic input in pre-clinical medical curriculum:

1. **Introducing `Spiritual History` taking from the first year:** Performing a spiritual history facilitates the practice of compassion with one's patients, and helps the clinician learn to integrate spirituality into the therapeutic plans [52]. Appendix B shows some models of spiritual history taking developed and used in some institutions [53-55].

   A study was conducted to evaluate the impact of a spiritual history-taking curriculum on the skills, knowledge, and attitudes of 1st year medical students [56]

   The results showed slightly improved ability in recognizing the patient's spiritual concerns and in accommodating the patients' beliefs. The researchers concluded that "spiritual history taking can be integrated effectively into the existing history-taking curriculum in first year of medical training".

   Another study concluded that students exposed to material on spirituality in medicine have shown greater understanding of the issue but no difference in clinical performance [57].

2. **Maximum exposure to knowledge:** Students should not be asked to limit their knowledge only to the `must know` topics, instead they should be encouraged to obtain as much information about a subject or topic as possible in order to enhance their understanding and lateral thinking skills.

3. **Students should be advised to use proper techniques to gain attention:** i.e. sub-vocal repetition of presented material.

4. **Motor system involvement to enhance memory and retention:** Writing or drawing are crucial memory enhancing tools as they incorporate the motor system in the learning process.

5. **Large class lectures:** to introduce topics related to philosophy of Islamic medicine. For example, introducing revelation as a prime source of knowledge, as Islam pointed out the scientific truths of anatomy, physiology, biochemistry, etc. centuries ago but were only known by modern science centuries later through decades of trials, errors and experiments

6. **Introducing the `Life of Prophet Muhammad (PBUH) ` as role model:** Students should be exposed to `*Sunnah*` and `*Hadith*` in order to develop an appropriate attitude and behaviour (Affective Domain).

7. **Teaching prayers (Duaa) and Names of Allah (al-Asma-al-Husna):** Students should learn and memorize some prayers from the *Qur'an* and *Sunnah* and the names and the meanings of the names of Allah and His attributes, to be a helpful source of guidance to patients.

8. **Evidence-Based Medicine (EBM) and Research methods:** EBM and research should be encouraged from the very beginning of training.

9. **Complimentary and Alternative Medicine (CAM):** CAM should be introduced from the beginning to help students in studying comparative medicine. Stress should be given to Islamic methods i.e. prayers, plants and herbs, honey and cupping (al-Hijamah).

10. **Personal and Professional Development (PPD):** Students should be encouraged to develop themselves as pious Muslims, life-long learners and competent and kind physicians.

Appendix A:

No.	Institution name and web address
1.	The Association for Spirituality and Mental Health at St. Paul University, Ottawa, Ontario, Canada. http://www.spiritualityandmentalhealth.org/home.htm
2.	Institute for Spirituality and Health at the Texas Medical Center. http://www.ish-tmc.org/history.php
3.	Medical University of South Carolina Center for Spirituality and Health. http://www.musc.edu/dfm/Spirituality/Spirituality.htm
4.	Indiana State University Center for the Study of Health, Religion and Spirituality. http://www1.indstate.edu/psychology/cshrs/addictions_conference.htm
5.	University of Florida Center for Spirituality and Health mission. http://www.ufspiritualityandhealth.org/mission/
6.	The George Washington Institute for Spirituality and Health (GWish). http://www.gwish.org/
7.	Royal College of Psychiatrists' Spirituality and Psychiatry Special Interest Group. http://www.rcpsych.ac.uk/college/specialinterestgroups/spirituality.aspx
8.	Center for Spirituality and Healing at University of Minnesota. http://www.csh.umn.edu/home.html
9.	The Benson-Henry Institute for Mind Body Medicine at Massachusetts General Hospital (BHI). http://www.mbmi.org/about/default.asp
10.	Centre for Spirituality, Health and Disability at University of Aberdeen. http://www.abdn.ac.uk/cshad/about.shtml
11.	3rd Australian Conference on Spirituality & health, Integrating Spirituality in the Practice of health care, 13-15 July 2009, Elder hall, Adelaide. http://www.spiritualityhealth.org.au/
12.	Spirituality in Higher Education: *A National Study of College Students' Search for Meaning and Purpose,* Higher Education Research Institute University of California, Los Angeles. http://www.spirituality.ucla.edu/

Appendix B:

1. SPIRIT model [53](Maugans, 1996)	S—Spiritual Belief System P—Personal Spirituality I—Integration and Involvement In a Spiritual Community R—Ritualized Practices and Restrictions I—Implications for Medical Care T—Terminal Events Planning (Advance Directives) Each letter represents an important component of the impact that spirituality may have on patients' experiences with Wellness and illness.
2. The HOPE questions [54](Anandarajah & Hight, 2001)	H—sources of hope, strength, comfort, meaning, peace, love and connection; O—the role of organized religion for the patient; P—personal spirituality and practices; E—effects on medical care and end-of-life decisions.
3. The FICA Spiritual History Tool [55] (The George Washington Institute for Spirituality and Health, 2001).	**F – Faith and Belief** Do you consider yourself spiritual or religious?" or "Do you have spiritual beliefs that help you cope with stress?" **I – Importance** "What importance does your faith or belief have in our life? Have your beliefs influenced how you take care of yourself in this illness? What role do your beliefs play in regaining your health? " **C – Community** "Are you part of a spiritual or religious community? Is this of support to you and how? Is there a group of people you really love or who are important to you?" **A – Address in Care** "How would you like me, your healthcare provider, to address these issues in your healthcare?"

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24. The Glorious Qur'an: 6,17.

25. The Glorious Qur'an: 39,38.

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27. The Glorious Qur'an: 113,1-5.

28. The Glorious Qur'an: 41,46.

29. The Glorious Qur'an: 42,30.

30. The Glorious Qur'an: 57,20.

31. The Glorious Qur'an: 5,32.

32. The Glorious Qur'an: 20,114.

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Problem Based Learning in Medical Curricula An Islamic Perspective

*Afshan Khan**

Abstract:

Problem based learning, PBL, has been used in medical education since 1970. It is one of the techniques used in "Student Centered Learning". It is known that Self Directed Learning, SDL, has clear long term benefits in enhancing student learning.. Educational institutions in Muslim countries have similarly incorporated these new teaching paradigms and educational methodologies with significant progress and success. Though not the only method of learning in SDL, PBL remains one of its cornerstone strategy. Various tertiary educational institutions in Muslim countries, amongst them the International Islamic University of Malaysia have adopted this teaching modality and have infused it with affective and Islamic values.

This paper reviews the literature about PBL and concepts related to it and attempts at conceptualizing medical education through PBL from an Islamic framework.

***Keywords**: Problem based learning, student centered learning, Islamic medical education.*

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Introduction:

Learner centered education is currently an accepted international standard of excellence in the world of graduate as well as undergraduate education. The concept of learner centered education is not a new one. The shift from traditional Teacher Centered Learning to current Student Centered Learning in medicine occurred in 1970's. Student Centered Learning is also termed self directed or learner centered learning. Self directed learning, SDL, is defined as students taking the initiative and subsequent steps for their own learning: students lead in diagnosing their learning needs, formulating multidimensional goals and desired learning outcomes, identifying academic and contextual resources, working in groups in prioritizing and implementing appropriate tasks and actions and finally evaluating their own outcomes[1].

Learner Centered Education is, therefore, the most widely accepted approach to fulfilling the needs of Adult Learning in any educational system including medical education[2].

Adults are motivated by learning that:

- Is perceived as relevant
- Is based on, and builds on, their previous experiences
- Is participatory and actively involves them
- Is focused on problems
- Is designed so that they can take responsibility for their own learning
- Can be immediately applied in practice
- Involves cycles of action and reflection
- Is based on mutual trust and respect, [3]

It can be clearly seen from above descriptions that concepts of SDL and Adult Learning are quite concordant. Self directed learning is an active process. It encourages the adoption of the deep approach to learning first. Deep learning, as opposed to surface learning, is an active search for understanding. Surface learning merely encourages students to reproduce what has been learnt. Research has identified the student's approach to learning-surface or deep-as the crucial factor in determining the quality of learning outcomes, [5]. A surface approach is common in courses that have a heavy workload, an unrealistic and excessive amount of course material, little or no opportunity to pursue subjects in depth, dictated choice over study areas and topics, and an examination or assessment system that provokes anxiety and mainly rewards rote memory and reproduction of facts even in absence of ability to apply that knowledge in real life situations.

Education systems that aim for deeper learning, on the other hand, provide a context in which main motivation is the learner's need to know,[5]. Such systems support active learning and exploratory study through research in small groups supported by a well structured knowledge base and pre-conceived learning outcomes. Aims and objectives, modes of information

transfer and techniques of assessment are continuously validated by faculties in these systems. Excellence is thus a product of an ongoing process of constant reviews aimed at improving the educational material and methodology for better learning.

SDL is suggested as the most efficacious approach for all tiers of medical education, pre-medical, undergraduate, graduate training and sub-specialty training up to various stages and types of continuing medical education,[7]. SDL assumes central role with or without institutional intervention or willingness to implement it when learning is based on experience, and new knowledge and understanding can be integrated into the personal and professional context of the individual. Strategies that have been developed as self directed learning include:

- Problem based learning
- Discovery learning
- Task based learning
- Experiential and reflective learning
- Portfolio based learning
- Small group, self instructional, and project based learning
- Peer evaluation and learning contracts.[7]

SDL has been used extensively in various institutions of academic excellence, both in the East and the West. The archetype methodology in Learner Centered Education is Problem Based Learning, PBL,[8, 9]. The application of problem based approaches in education is not new. In 1889 a method known as "multiple working hypotheses" was advocated,[10]. Dewey, one of the educational theorists of the early part of twentieth century, recommended that students should be presented with real life problems and then helped to discover the information required to solve them. Later, other workers showed that giving students ready made solutions for problems was "manifestly ineffective" for learning,[11]. In the late 1960s, McMaster medical school in Ontario, Canada, pioneered the first completely problem based medical curriculum, with Maastricht following in 1974 as the first in Europe,[11]. Around 150 medical schools worldwide (some 10% of the total) have adopted problem based curricula.

Problem based learning can be seen as "a systematic attempt to apply findings of cognitive psychology to educational practice",[12]. Relevant areas include: activation of prior knowledge (a major determinant of what can be learnt); learning in context (enhancing transfer of knowledge); elaboration of knowledge (enhancing subsequent retrieval); and fostering of competence by an inquisitive style of learning,[12,13]. Problem based learning fits with what is known about the development of clinical reasoning and the process by which so called "illness scripts"—cognitive structures describing the features of "proto typical" patients—are acquired,[13].

There is no evidence, however, that generic problem solving skills are enhanced through problem based learning,[14]. Several authors have

reviewed the evidence for and against problem based learning,[14-16], and in spite of semantic difficulties, different study designs, confounding variables, and different interpretations of the evidence, several benefits have been identified. The identified benefits of PBL can be summarized as follows:

- Promotes deep, rather than surface, learning
- Enhances and retains self directed skills
- Learning environment is more stimulating
- Promotes interaction between students and staff
- Promotes collaboration between disciplines—for example, basic and clinical scientists
- More enjoyable for students and teachers
- Promotes retention of knowledge
- Improves motivation, [17]

Some of these benefits may be indistinguishable from those related to other curricular innovations. Maudsley,[17], however, considers problem based learning to have survived unprecedented scrutiny. Above advantages have been demonstrated several times , in different studies conducted in different countries with differing systems of medical instruction,[17]. Several disadvantages have also been identified including the initial costs and human resource required for the start up and maintenance of PBL systems, excessive demands on staff time and efficiency, increased stress due to higher learning needs on both students and faculty, relatively reduced acquisition of knowledge of pure basic sciences, and implementation difficulties when class sizes are large or where there is an absolute or relative lack of enthusiasm among the implementing members of faculty and staff for the approach,[16]. Finucane and colleagues provide a balanced consideration of the advantages and disadvantages of adopting a curriculum for problem based learning,[18]. There is as yet no concrete and mutually agreed upon evidence that graduates of problem based medical instruction programs make better, worse or exceptional teachers or practitioners in the long term.

It is easy to gather from above background information that PBL, although a very elegant and attractive philosophy of medical instruction, nonetheless comes at a price; both literally and metaphorically speaking. Following is a list of pre-requisites to the institution of PBL as the main educational strategy compiled as a consensus document in 1993 World Summit on Medical Education of the World Federation for Medical Education,[19, 20]:

- Class size limited to 100 students, [20]
- "Small Groups" of students with, preferably 6 students per group, [20]
- Infrastructure support with tutorial rooms, computers, libraries and skill labs,[21, 22]
- Faculty commitment with subsequent integration of medical curriculum PRIOR to placing PBL as

main mode of instruction, [23]
- "PBL Supporting Curriculum",[23]
- Administrative commitment to revision of curricula and acceptance of financial implications,[24]
- Faculty and staff committed and trained in PBL Instruction,[24,25]
- Specially trained PBL Instructors,[26]

PBL In Islamic Medical Instruction, IMI

Islamic Medical Education, IMI, is a relatively new term introduced in the 1980's and presented as a viable concept in Medical Education in First International Islamic Medicine Conference in Kuwait,[27]. Islamic Medicine was the original term used in Kuwait at that time and was accepted generally to embody the ethical and medical conduct of a Muslim Physician. Islamic Medicine can only result from provision of Islamic Medical Education. As a logical step in reverse engineering of the term Islamic Medicine, we find that in order to have a system of Islamic Medical Education, we have to devise a school of Islamic Medical Instruction. The aims and objectives, curricular design and assignment of modes of information transfer; all form parts of this greater whole.

As already identified above, an integrated medical curriculum is a pre-requisite for institution of PBL,[23]. In case of IMI this integration will not only bind the sciences together but it will also bring relevant principals of Islamic Medical Ethics and references from Islamic Medical History into play. The resulting curriculum will be a vibrant and rich tapestry of pure sciences, Humanora, Islamic and general medical ethics and learning in Islamic medical history and civilization. PBL or the proposed Islamic PBL can only then be instituted in a medical institution possessing such a curriculum. Few successful examples can be quoted about such endeavors in Islamic Medical Curriculum Development. After an exhaustive review, one can quote the example of International Islamic University of Malaysia. This curriculum is pioneered by the Faculty of Medicine under Dr. Omar Hasan Kasule, Sr in 1997,[27]

Dr. Omar Hasan Kasule, Sr. in a paper presented to the first International Islamic Medicine Conference, Kuwait (Kasule 1980) argued that Islamic medicine can be defined only as values and ethics and not as any specific medical procedures or therapeutic agents. This definition allows Islamic medicine to be a universal all-embracing concept that has no specific or particular time-space characteristics. A definition based only on values is however too general to be useful operationally. Values can be very subjective and difficult to define exactly. An excerpt from Dr. Omar Hasan Kasule's paper is given here for better understanding of the concept of IMI.

> *"There is an argument that you can get to Islamic medicine by 'Islamizing" the physician especially during training. Then you are sure that his research, work and practice will be in conformity with the teachings of Islam. Naqib (1984) proposed a complete Islamically-based education*

system for an aspiring physician starting from elementary to post graduate levels including describing attributes of a physician, his rights and obligations. Deep study of medicine with reflection shows the physician the majesty of the Creator and this deepens and strengthens iman (Jalabi 1974, Jalabi 1978, Kasule 1980). A believing physician will be more ethical in his research and practice. Ethics involves: making sure the physician has the appropriate level of knowledge and skill, charging reasonable fees for services, etiquette with patients especially of the opposite gender, treating patients after their consent. There have been several attempts to define medical ethics for a Muslim physician, ancient and modern. Al Tabari described the Islamic code of medical ethics in 970 AD to include the following: personal characteristics of the physician obligations towards patients, obligations towards the community, obligations towards colleagues, and obligations to his assistants. The Islamic Medical Association of the US and Canada (presently the Islamic Medical Association of North America -IMANA) adopted the Oath of a Muslim Physician in 1977 as an alternative to the Hippocratic oath. The Islamic Code of Medical Ethics was issued by the Islamic Organization for Medical Sciences, Kuwait 1981. Amine and El Kadi (Athar, 1993) based medical ethics on the Qur'an "the physician must believe in God, and in the Islamic teachings and practice it in private and public life; be grateful to his parents, teachers, and elders; be humble, modest, kind, merciful, patient, and tolerant; follow the path of the righteous; and always seek God's support. The Muslim physician must stay abreast of current medical knowledge, continuously improve his skills, seek help whenever needed, and comply with legal requirements governing his profession; realize that God is the maker and owner of his patient's body and mind and treat him within the framework of God's teachings; realize that life was given to man by God, that human life starts at the time of conception, and that human life cannot be taken away except by God or with His permission; realize that God is watching and monitoring every thought and deed; follow God's guidelines as his only criteria, even if they differ with popular demand or the patient's wishes; not recommend nor administer any harmful material; render needed help regardless of financial ability or ethnic origin of the patient; offer needed advice with consideration for both the patient's body and mind; protect the patient's confidentiality; adopt an appropriate manner of communication; examine a patient of the opposite sex in the presence ot a third person whenever feasible; not criticize another physician in the presence of patients or health personnel, refuse payment for treatment of another physician or

his immediate family; and strive to use wisdom in all his decisions".[28]

Inculcation of principals of PBL in IMI is a natural consequence once an educational system is committed to IMI. IMI demands a basic paradigm change from conventional teaching of medicine. It places the physician in the position of a servant of Allah rather than the "Godplayer" role assigned to physicians in the West. Such paradigm or attitude change is possible after the principles of "Affective or Attitudinal" education are followed.

Educational psychologists have drawn on findings from a number of studies to create a series of six guidelines for effective design of attitude instruction. The best set of guidelines, which is most frequently used in adult instruction, is form Simonson and Maushak,[29]. These are:

1. Make the instruction realistic, relevant, and technically stimulating
2. Present new information
3. Present persuasive messages in a credible manner
4. Elicit purposeful emotional involvement
5. Involve the learner in planning, production or delivery of the message
6. Provide post-instruction discussion or critique opportunities

A review of principles and benefits of PBL given earlier in this paper shows the close concordance of PBL strategy with the requirements of IMI.

Institutional commitment is the foundation to any educational intervention. Once an institution of medical education is committed to placing IMI as its main instructional strategy, the next step is involvement of its faculty and staff in this process of change of paradigms. A series of workshops and interactive sessions should be conducted in order to give everyone an opportunity to voice their opinions and have their reservations addressed at the outset. The next and most important step from here onwards is curricular revision and innovations needed to place identified areas of IMI to be integrated with medical curriculum. It is the opinion of the author that a SPIRAL integration of medical curriculum with pre-identified core areas of IMI in tandem with medical subjects is the most suitable among known designs of medical instruction.

It is easy to visualize for someone with basic know-how of PBL strategy that students can be asked problems that directly or indirectly address aspects of Islamic medical ethics or Islamic Civilization. PBL packages can be written so that participants research issues related to *Shari'ah* or *Fiqh* in order to understand the trigger problem completely.

For purpose for further clarification of the concept of Islamic PBL, let us consider a PBL trigger given students of second year medical studies:

"You are working as senior medical officer in a basic health unit in a poor slum area near a big city. On one morning, you are seeing patients in your daily OPD when a young woman

of 23 years, who is a regular patient at your unit, approaches and asks to see you in private. She tells you that she is married with 5 children and is currently pregnant with her 6th baby. She asks for advice about termination of this pregnancy. You inform her that such services are not offered at your unit and besides it is not allowed in Islam to do so. She gets visibly upset and tells you that she will go to a nearby roadside Dai and get an abortion done if you did not help her. You try your best to counsel her but she is adamant and leaves your unit in a hurry."

It is evident from the above scenario that the student will consider Islamic verdict on termination of pregnancy when identifying the Learning Outcomes for this trigger. Facilitators can be trained to explain this issue with reference to Qur'an, *Hadith* and *Fiqh*. A simple case of illegitimate abortion can be used to explain complex concepts such as sanctity of life in Islam.

In conclusion, PBL appears to be a satisfactory, if not perfect, answer to addressing many questions related to provision of effective IMI in Islamic institutions. The key steps in placement of Islamic PBL, in essence, are wholehearted institutional commitment, involvement of all key players in planning and implementation, extensive curricular planning with Islamic inputs, patient redress of problems and open minded approach to constructive critique, and finally well designed educational research to validate the methods as well as results locally and internationally.

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Teaching Medical Professionalism:
An Islamic Approach

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Abstract

The universal concept of teaching of medical professionalism highlights the practice of medicine as a moral endeavour that requires a rigorous application of behavioral and ethical standards and scientific training. Before the medical student becomes a medical practitioner, he must be taught and trained to practice the core values of professionalism in his life: dedication, respect, compassion and empathy, honesty, altruism, responsibility, integrity, self-improvement, magnanimity and accountability.

The student-centred approach of learning is an effective way for the medical student to acquire the understanding of medical professionalism.

Through an integrated Islamic approach on the teaching-learning of medical professionalism, medical students in their early years in colleges, who are identified to be unwilling to be properly educated, should be counseled and if they show no signs of improvement, they should be guided to leave undergraduate medicine and choose a different course in their lives.

Keywords: *Medical professionalism, student-centred approach, Islamic Medical Education.*

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Introduction

This is a preliminary thought on the Islamic approach to the teaching of medical professionalism. It consists of three parts:

1. The universal concept and teaching of medical professionalism;
2. The student-centred approach of learning medical professionalism;
3. An integrated Islamic approach on the teaching-learning of medical professionalism.

1.The Universal Concept and Teaching of Medical Professionalism

In the West, the term "professionalism" has been in use for more than a century. It describes:

- professional character, spirit, or methods;
- the standing, practice, or methods of a professional; and
- traits that are accepted by peers as professional and not amateurish.

This description of a professional distinguishes the professional from an amateur who lacks any one or all of these criteria.

1.1 Professionalism and Medicine

Medicine is considered to be the classic example of a profession. The term professionalism embraces a set of attitudes, skills and behaviors, attributes and values. These are expected from those to whom society has extended the privilege of being considered a professional. In other words, a person claiming to be a professional must prove that a set of attitudes and attributes are found in his life.

Being a profession, the practice of medicine has the following criteria:

- It is a moral endeavour;
- It requires a rigorous application of behavioral and ethical standards;
- It requires scientific training;
- It is the ability to care for humans in distress with compassion and empathy; and
- It is the ability to discipline the emotion and the mind when faced with a situation that can threaten the integrity of the set standards of professionalism.

1.2 The Medical Practitioner

After undergoing training, a medical practitioner

- masters a body of knowledge and skills to be used in the service of mankind;
- upholds the highest standards of ethical and professional behaviour; and
- is a trusted professional in a patient-doctor relationship.

1.3 Professional Values

Before the medical student becomes a medical practitioner, he must be taught and trained to practise the following core values of professionalism in his life (the combination of the first letters of all core values form the words DR. CHARISMA):

- **D**edication
- **R**espect
- **C**ompassion and Empathy
- **H**onesty

- **A**ltruism
- **R**esponsibility
- **I**ntegrity
- **S**elf-improvement
- **M**agnanimity
- **A**ccountability

During the last decade of the last century, the teaching of professionalism has become one of the priorities in medical education. There is even a chair for professionalism training in at least one North American university whose academic-professional commitment can be quoted:

"In parallel, we the teaching faculty are given the responsibility for ascertaining that our students have the knowledge and skills to embark on the next stage of their preparation to become doctors, either family practitioners or specialists."[1]

2. The Student-centred Approach of Learning Medical Professionalism

2.1 Student-Centred Curriculum on Medical Professionalism

Dr. Gregory A. Plotnikoff, of Keio University in Tokyo and Dr.Takahiro Amano, director of the same university's Medical Education Center, summarised their findings in an August 2007 Minnesota Medical Association report "A Culturally Appropriate, Student-Centered Curriculum on Medical Professionalism: Successful Innovations at Keio University in Tokyo" in the following words:

"Professionalism is a Western concept without a precise equivalent in Asian cultures. The term itself cannot be translated directly into any Asian language, nor does the spectrum of words based on the verb "to profess" exist in any Asian language. In addition, the foundational assumptions found in the West's celebrated Charter on Medical Professionalism do not match Asian ways of thinking regarding autonomy, service, and justice. Finally, there is no tradition in Asia of reciting an oath at medical school graduations. Despite the fact that professionalism is literally a foreign concept in Asia, Keio University School of Medicine in Tokyo has successfully introduced a professionalism curriculum that both supports Japan's cultural traditions and affirms the school's academic mission. This article describes a series of educational events for medical students in the university's 6-year undergraduate program. These include development of a course on medical professionalism for students in their third year, a year-long extracurricular oath-writing project for fourth-year students, introduction of a White Coat Ceremony at the start of the fifth year (when students begin their clinical rotations), and a reflective writing requirement for sixth-year students on professionalism and humanism as witnessed during clinical rotations."[2]

Their conclusion:

"At Keio University School of Medicine, we are teaching professionalism using a sequential, overlapping, student-centered approach that is incorporated into the formal curriculum and extracurricular

activities. Although efforts to instill professionalism are focused on students in their final 4 years of medical school, in the near future, activities will be incorporated into the first- and second-year curriculum. The extremely positive response we've received since starting this initiative demonstrates that even in a culture unfamiliar with the concept of medical professionalism, it can be taught in a way that is appreciated by students and faculty."[2]

2.2 Student-Centred Team-Based Learning (SCTL) at CUCMS

Since the inception of Malaysia's Cyberjaya University College of Medical Sciences (CUCMS) in 2005, the SCTL is applied from the 1st to the 5th Year of the five-year medical programme.[1] (The Bachelor of Medicine and Bachelor of Surgery (MBBS) degree is conferred on successful graduates). Medical professionalism is another area of medicine that can be learned by medical students through the SCTL.

3. An Integrated Islamic Approach on The Teaching-Learning Of Medical Professionalism

This section is divided into five sub-sections:

2.1 Holistic Education

Islamic education is an essentially holistic teaching-learning-training triad that covers all the four aspects of life:

- Bio-physical;
- Psychological;
- Social; and
- Spiritual.

These four aspects are never separated at any one time of the student-novice's life. They are constantly interacting. For instance, while the student-novice is seating in the lecture hall, he would be feeling comfortable or finds his physical environment too warm or too cold. If he succumbs to worries about his family's latest crisis, he would not be able to concentrate. Then there is the spiritual blessing he seeks from God and yearns to see it as always present in his life. The means employed during this process are also important. Legal and ethical means are related to socially accepted norms and spiritually blessed methods.

Thus education (*al-tarbiyyah*) can be presented in the following Figure 1. The teacher is a *murabbi* (the enlightened educator-trainer), a model for the student who needs a guide for righteous living; while the student is a novice and seeker of truth.

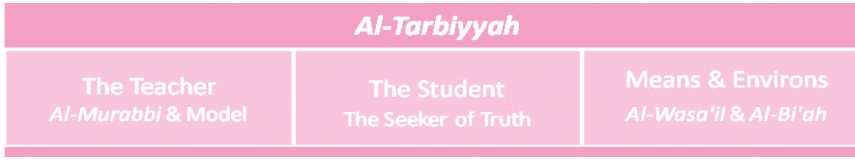

Figure 1: Education (*Al-Tarbiyyah*)

3.2 Human Psychology and Divine Enlightenment

Components of human psychology are:

- The cognition (*al-'aql*) which can be divinely enlightened and has the discerning ability to differentiate right from wrong, truth from falsehood; and
- Emotion (*al-qalb*) which is the innermost feeling and essence of the human heart that has the spiritual capacity to be the receptacle for divine light, thus enabling it to perceive correctly this fleeting life and not be ensnared by it.

To gain the Pleasure of Allah, one's heart must be sincere. This principle is found in a well known Hadith narrated by 'Umar ibn al-Khattab (RA) who heard it from the Prophet Muhammad (PBUH) who stated in part

"Verily, all deeds are according to the intentions and everyone (will be rewarded) according to what he has intended…"[3]

The sincerity that is sustained and well maintained brings tranquillity to the heart. It must be emphasised too that the emotional-spiritual heart that is tranquil is the one that remembers and is close to Allah.

الَّذِينَ آمَنُواْ وَتَطْمَئِنُّ قُلُوبُهُم بِذِكْرِ اللّهِ أَلاَ بِذِكْرِ اللّهِ تَطْمَئِنُّ الْقُلُوبُ

"Those who believe, and whose hearts find tranquillity in the remembrance of Allah; for in the remembrance of Allah do hearts find tranquillity."[4]

The direct opposite of the tranquil and healthy heart is the diseased heart. Its pathology is the result of the deceitful owner's own doing.

فِي قُلُوبِهِم مَّرَضٌ فَزَادَهُمُ اللّهُ مَرَضاً وَلَهُمْ عَذَابٌ أَلِيمٌ بِمَا كَانُوا يَكْذِبُونَ

"In their hearts is a disease; and Allah has increased their disease; and grievous is the penalty they (incur), because they are false (to themselves)."[5]

In brief, the basic state of the cognition (mind) is sanity, while its excellent state would be maturity. The basic state for the emotion (heart) is sincerity, while its excellent state would be tranquillity.[6]

There would be times too, during moments of supreme enlightenment, that both the cognition (*al-'aql*) and the emotion (*al-qalb*) become one as evident from the following verse:

أَفَلَمْ يَسِيرُوا فِي الْأَرْضِ فَتَكُونَ لَهُمْ قُلُوبٌ يَعْقِلُونَ بِهَا أَوْ آذَانٌ يَسْمَعُونَ بِهَا فَإِنَّهَا لَا تَعْمَى الْأَبْصَارُ وَلَكِن تَعْمَى الْقُلُوبُ الَّتِي فِي الصُّدُورِ

"Do they not travel through the land, so that their hearts gain understanding and causing their ears to hear? Truly it is not their eyes that are blind, but blind have become their hearts which are in their breasts."[7]

3.3 The Quranic Principles of Professionalism.

The basic principle of Islamic medicine is the concept of the Oneness of Allah (*tawhid*). It is on this sound principle that the whole edifice of Islamic medicine is built. Every Muslim medical science student or practicing physician must have the following

Quranic verse safely kept in his heart. It is manifested in his daily attitudes, actions and practice. Only then will he not lose his bearing as a believer in the Oneness of Allah. His undivided belief in Allah as the Supreme Healer will not be compromised. This is the first stage of medical professionalism.

وَإِذَا مَرِضْتُ فَهُوَ يَشْفِينِ

"When I am ill, it is He (Allah) Who cures me."[8]

This verse is actually a statement of *tawhid* in his professional practice. When coupled with the next verse, the believer finds a pair of Quranic verses that will strengthen his resolve as a believer who practices medicine:

وَلَوْ جَعَلْنَاهُ قُرْآنًا أَعْجَمِيًّا لَّقَالُوا لَوْلَا فُصِّلَتْ آيَاتُهُ أَعْجَمِيٌّ وَعَرَبِيٌّ. قُلْ هُوَ لِلَّذِينَ آمَنُوا هُدًى وَشِفَاء وَالَّذِينَ لَا يُؤْمِنُونَ فِي آذَانِهِمْ وَقْرٌ وَهُوَ عَلَيْهِمْ عَمًى أُوْلَئِكَ يُنَادَوْنَ مِن مَّكَانٍ بَعِيدٍ

"Had We sent this as a Qur'an (in the language) other than Arabic, they would have said: "Why are not its verses explained in detail? What! (a Book) not in Arabic and (a Messenger) an Arab?" Say: "It is a Guide and a Healing to those who believe; and for those who believe not, there is a deafness in their ears, and it is blindness in their (eyes); They are (as it were) being called from a place far distant!""[9]

It is only from here that the student or practitioner proceeds on to the next stage of professionalism – that of physical and moral strength, of normal physical health and trustworthiness.

قَالَتْ إِحْدَاهُمَا يَا أَبَتِ اسْتَأْجِرْهُ إِنَّ خَيْرَ مَنْ اسْتَأْجَرْتَ الْقَوِيُّ الْأَمِينُ

"Said one of them: "O my father! employ him, surely the best of those that you can employ is the strong, the trustworthy one.""[10]

3.4 Islamic Code of Medical Ethics

The medical community within the Muslim Nation (*Ummah*) has always been fortunate for it has never needed to grope in the dark as regards guidelines and principles of medical practice and professionalism are concerned. The Islamic Organisation of Medical Sciences' Islamic Code of Medical Ethics[11] stands witness to the untiring efforts of the Muslim medical community to always improve itself and its services. The Code's 12 chapters become beacons of professionalism in a practice that is at once honourable as it is demanding:

- Definition of Islamic Medicine
- Characteristics of the doctor
- Relationship among doctors
- Relationship between the doctor and the patient
- Professional secrecy
- Responsibility of the doctor during war
- Responsibility of the doctor
- The doctor and the sanctity of human life
- The doctor and society
- The doctor and the development of modern medical science
- Medical education
- Oath of the Muslim doctor.

3.5 Islamic Approach to Medical Professionalism

The Qur'an warns the Prophet (PBUH) about hypocrites who are not trainable or who are not willing to be educated.

وَمِنْهُم مَّن يَسْتَمِعُونَ إِلَيْكَ أَفَأَنتَ تُسْمِعُ الصُّمَّ وَلَوْ كَانُواْ لاَ يَعْقِلُونَ

"Among them are some who (pretend to) listen to you; but can you make the deaf hear, even though they are without understanding?"[12]

Sometime, the likes of them are found in the medical profession. They must be identified even while they were at the preparatory stage as a first or second year medical student. They should be counseled and if they show no signs of improvement, they should be guided to leave undergraduate medicine and choose a different course in their lives.

"Abu Hurairah (RA) narrated that the Prophet (PBUH) said, "People are of substance like the substance of gold and silver; the best of them during *jahiliyyah* are the best in Islam if they gain knowledge; and the souls are hosts which are sent around, the similar ones get acquainted, and the different ones separate from one another.""[13]

While medical students undergo intensive medical education and training, they must learn at a very young age that apart of professionalism is the understanding and attitude that prevention is better than cure.

Figure 2: "Prevention is Better than Cure". This familiar medical adage is written in the *nasta'liq* style of calligraphy by an Iranian farmer-calligrapher.

To teach medical students Islamic medical professionalism, it is best that the teaching institution has a philosophy that is Islamic. An example is the CUCMS Philosophy:

"To harness human potential in a comprehensive manner to produce holistic health care providers who are intellectually, emotionally and spiritually-balanced based on the principles of Islam and the obedience to the Almighty Allah."

وَنُنَزِّلُ مِنَ الْقُرْآنِ مَا هُوَ شِفَاء وَرَحْمَةٌ لِّلْمُؤْمِنِينَ وَلاَ يَزِيدُ الظَّالِمِينَ إِلاَّ خَسَارًا

"We send down (stage by stage) in the Qur'an that which is a Healing and a Mercy to those who believe, to the unjust it adds nothing but loss after loss."[14]

There may be various ways to teach medical professionalism to medical students. The SCTL approach has proven to be effective and exciting. Instead of undergoing passive learning, the students are encouraged to be creative and proactive. They are also able to own up the experience of discovering themselves how medical professionalism can begin very early in their lives as students.

The White Coat Ceremony at the start of the clinical phase mentioned above is a commendable idea worth considering.

CONCLUSION

In this three-part article, the author proposes an Islamic approach to the teaching of medical professionalism. It is still a preliminary thought on the subject. Comments and criticisms are welcome. It is hoped that by quoting experiences of medical educators in the West and in the East, Islamic medical educators will widen the horizons of their own experiences, enabling a cross-pollination of ideas with the betterment of mankind in mind.

We seek the Guidance of Allah in our academic-professional pursuits. It is only for His Pleasure that we strive for.

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Workshop for Teaching Medical Professionalism
at the Kulliyah (faculty) of Medicine at International Islamic University Malaysia (IIUM)

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Abstract

Training medical professionals requires thorough planning through well-thought medical curriculum that takes into account the changes surrounding intends the profession itself and the expectations of the community with regard to the graduate that it intends to produce. The Kulliyah (faculty) of Medicine, International Islamic University Malaysia, (IIUM) pioneered what it called, Islamic Input Medical Program (IIMP) since its inception in 1995, in its effort to produce a different 'breed' of doctors who not only excel in their professional duty but also portray conduct, (*akhlaq*) expected of a good Muslim.

A good Muslim doctor is expected to portray a highest degree of medical professionalism and demonstrate proper etiquette while dealing with his/her patients and community. However, inculcating professionalism and proper etiquette among medical undergraduates is not an easy matter. Learning this value could be done through a workshop activity whereby students demonstrate their understanding on these aspects of care through discussion of case studies given to them prior to the scheduled activity. This article describes the approach that has been implemented over the past two years at this faculty.

***Keywords**: Medical curriculum, professionalism, Islam, Islamic input.*

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Introduction

It is the medical lecturers' responsibilities to train their students to internalise the meaning and later live up with the desired level of professionalism expected by the medical profession and more importantly, the patients whom they treat. Their attitude and practice of professionalism have important impact on the minds of these future doctors. Nurturing this value could be done through many ways and obviously lectures alone are inadequate. Students must first be made aware of its importance and become motivated to internalise and demonstrate the behavior diligently during their interaction with patients. They must know that their duties require a certain level of professionalism, failing which would land them into problems.

With regards to teaching professionalism, introductory lectures on the subject is all that is required. Students, as adult learners should be motivated to search for additional information on the subject, deciphering its meaning and translating it into action during their encounters with patients. Over the years of training, with perseverance, they should be able to develop the desired level of professionalism in managing their patients. At the Kulliyah (faculty) of Medicine, International Islamic University Malaysia (IIUM), a specifically designed module on medical professionalism and proper physician etiquette is structured for third year medical students prior to their first encounter with patients in the ward. Carried out as a workshop and named, "Workshop on Medical Professionalism and Proper Physician Etiquette", it is a student-centred approach of learning that is integrated with Islamic values, in line with the vision and mission of the University that subscribes to the agenda of Islamisation of knowledge[1]. A brief account of the Islamic Input in Medical Program (IIMP) is highlighted in this writing together with the operational definition of professionalism and the detail of the above teaching-learning module.

Teaching of medical professionalism

Islamic Input in Medical Program or IIMP represents a new paradigm shift in medical education that aims to inculcate ethical values in the students so that upon graduation, they would be a different 'breed' of doctors who not only excel in their professional duty but also portray conduct, (*akhlaq*) expected of a good Muslim[2]. The "Workshop on Medical Professionalism and Physician Etiquette" is the first step of a long journey in training doctors of tomorrow, where they are expected to serve their patients in the most professional way and with the right etiquette, in line with the principles of Islam. It is envisaged that after undergoing the integrated education system, the graduates should be able to carry the heavy trust, (*amanat*) of being professionally competent

and having good conduct, (*akhlaq*) and develop the following attributes such as being highly motivated for improvement of personal, professional, intellectual and spiritual development; observing proper etiquette of dealing with patients and colleagues and having good leadership and managerial skills

For practical purposes, the IIUM includes the operational definition[3] of professionalism that evolves around acquiring four main attributes, summarised as 2E's and 2C's. The 2E's stands for Expert and Ethical while the 2C's represent Communication and Compassion. Students should understand that it is their duty to develop optimal level of professionalism by first ensuring that they live up to the expectation of their profession as experts. In carrying out their duties, they should perform them in the most ethical way; be able to communicate appropriately and effectively while demonstrating compassion and interest to help alleviate their patients' problems.

Workshop on Medical Professionalism and Proper Physician Etiquette

The "Workshop on Medical Professionalism and Physician Etiquette" is designed as a forum that facilitates the understanding of students of their duties as doctors. Learning in small groups, they discuss a case study assigned to them and discuss the issue presented in it. The case studies represents common realities encountered in daily clinical practice that students would face as doctors, where they are expected to give their services in the most professional and ethical way. Through discussion of the cases, they would learn the importance of exercising professionalism and demonstrating proper physician etiquette while dealing with patients. Hopefully, the hands-on experience and skill obtained from the workshop would make them better doctors as they would be more knowledgeable and motivated to practice professionalism and proper etiquette in dealing with their patients.

The objectives of the workshop are to educate students about the importance of medical professionalism and physician etiquette in patient care; to provide hands-on knowledge and skill on medical professionalism and physician etiquette in patient care and to integrate Islamic values into clinical practice. At the end of the workshop each student should be able to apply the general principles of medical professionalism and proper physician etiquette in providing total patient care; demonstrate professionalism and proper etiquette of a Muslim Physician when dealing with patients and recognize the various needs of patients and their environment which are pre-requisites for good clinical practice.

Each group is given a Case Study at least two weeks prior to the workshop scheduled day. In order to enhance the good team work each group is required to choose a team leader who

takes charge of the group activities and a secretary who keeps track of discussions and record the decision made by the group. All the case studies portray the lacking of professionalism and proper physician etiquette, which each group has to identify. They should then discuss on how best to treat the patient (i.e. the Case Study) where they would be seen as behaving appropriately as Medical Doctors in terms of professionalism and proper physician etiquette. The learning activity provides opportunities to sharpen communication skills and to integrate Islamic values which are necessary for effective and confident interaction with patients and their families. It also allows them to appreciate that most patient care requires team work that involves interaction with fellow colleagues, superiors, subordinates and other health care workers.

Conducting the Workshop

Many of the lectures covered in the four-week Elementary Clinic are in consonance to the theme of professionalism and etiquette. Consequently, these lecture notes become important references for students in the discussion of the Case Studies assigned to them, which would be discussed in their respective groups. Each group is given a Case Study two weeks prior to the workshop. This learning activity is meant to be interactive and lively where everyone takes initiative and interest to learn about medical professionalism which can be simply defined as values, attitudes and behavior expected by society of a medical professional. Each group is required to demonstrate their understanding on professionalism and proper etiquette in managing their 'patient' (Case Study) using audio-visual aid and other methods such as role play. They are also required to write a report and submit it to the coordinator/facilitator of the workshop on the workshop scheduled day for grading purposes.

This learning methodology is a better approach to achieve the novel objectives of inculcating medical professionalism and proper physician etiquette in the minds of our future doctors. Under the guidance of medical teachers, medical students learn the importance of these issues and demonstrate them through discussion of the Case Studies. The knowledge and skills acquired at the workshop would make them more confident as they start seeing patients in the wards and clinics. Eight common clinical situations, appropriate for their level, are selected for discussions at the workshop and represent important themes listed below:

i. The first impression – appearance and composure
ii. Examining patient of different gender
iii. Medical confidentiality
iv. Taking verbal consent
v. Refusal of treatment and at own risk discharge

vi. Breaking bad news

vii. Making *du'a'* before a procedure

viii. Salat for the sick

Students are required to demonstrate their professionalism and proper etiquette in managing the 'case study'. Each group decides the role that each member plays in dealing with the 'patient' in the case study and demonstrates his/her professional attitude and proper etiquette expected of a safe practitioner.

The role of the facilitator

In order to ensure that the learning objectives are reached, each group is assigned a lecturer who shall guide and motivate the students under their charge. The medical lecturers function as facilitators who ensure that the learning objectives are achieved. A facilitator, assigned to each group is a resource person for the students and whose experience is readily sought after in discussing the case study. Their professionalism and etiquette *('adab)* in dealing with the patient in the case study is a source of inspiration for students to emulate. The leadership role of teachers is important as role modelling is a powerful force in medicine[4].

The kind of leadership teachers give is critical to the quality of medical practice and education and to professional self regulation. Marinker used the term "the hidden curriculum" to describe the effect of the professional attitudes and behavior of clinical teachers on students and doctors in training. The everyday behavior of clinical teachers is the living demonstration of their expertise, ethics, and commitment: their professionalism. What they do and how they do it matters as much as what they say-as in, for example, communicating with patients, students and colleagues; recognising the limits of their own practice; using clinical audit to improve their practice; applying formative peer appraisal for their own professional development; handling personal criticism; tackling poor performance in themselves and others; and caring for colleagues in difficulty. This is indeed a heavy task, more so at this Kulliyah as we aspire to produce doctors who will be able to carry out the heavy trust, (*amanah*) of a Muslim Physician which is defined as being professionally competent and having good conduct, (*akhlaq*) as a Muslim.

Group presentation

Each group is expected to present the assigned Case Study and to demonstrate to the rest what they believe to be the best approach in managing the Case in the most professional and ethical way. Use of multi-media presentation such as Power Point and video is highly encouraged. Video presentation allows for peers and facilitators to review the group performance with respect to medical professionalism and proper physician etiquette, especially in the areas of communication, team management, multi-tasking and resource utilization.

Debriefing

Group debriefing is recommended with all team members present. The main objective of the debriefing session is to ensure that the learning objectives are achieved. Feedback from fellow colleagues and facilitators would be factual, focused on performance and key learning so that everyone would feel happy and enjoy the learning activity. The Chief Facilitator would solicit the trainee's perception of how they did, discuss specific performance issues and then review the key teaching points outlined in the case studies.

Evaluation

Feedback from students is important for future improvement of the workshop. Evaluation forms are distributed to students before and after the workshop to find out their expectations and experiences about the workshop. Students may also submit their journals and they would also be encouraged to express what they thought especially if they believe that there were areas for improvement which had been overlooked by the teachers/facilitators. This is important for continuous improvement of the workshop so that it meets the very purpose of the University's agenda, i.e. Islamization of knowledge through the Islamic Input in the Medical Program.

Prizes given for the "Best Group Presentation" and "Best Case Study Report" is an incentive for them to give their best performance in portraying their understanding and commitment to medical professionalism and proper physician etiquette. This learning activity should make them more confident as they are now more knowledgeable and thus be at ease seeing patients in the ward as they go through their respective clinical rotations. Equally important is their ability and commitment to integrate Islamic values in discussing the case studies and hopefully be able to translate whatever they learn into practice as they see patients in wards, clinics, operation theatres, etc. Hopefully, this workshop enhances their understanding and commitment of true professionalism in medical practice and portraying proper etiquette *('adab)* while dealing with patients and their family members.

Keeping a Journal

Students are encouraged to write their experiences, comments and ideas in a journal. They may write on anything that interest them, either about the workshop or any other issues which cause displeasure to them in terms of the 'ideal Islamic environment' that they would wish it to be implemented. Journal-writing helps them reflect on themselves and work out how much they have learnt from the case studies that were discussed during the workshop. It also allows them to appreciate different ideas, or new interpretations in the management of these cases. Finally, they would be encouraged to write down the most valuable experience they get from this particular learning activity.

Conclusions

This workshop is an important learning activity for students to understand the concept of medical professionalism and proper physician etiquette. It is a venue for them to learn, internalize and demonstrate their understanding of the issues from discussion of the case study as well as learning from the medical teachers, i.e. the facilitators. It is a hands-on learning experience for students, with respect to integrating the Islamic values and practicing Islamic culture (such as giving *Salam,* giving advice and observing good *akhlaq,* (manners) while dealing with patients in the case studies. The experience obtained from the workshop would make them more confident seeing patients and their relatives as they would then be more knowledgeable in demonstrating professionalism and good etiquette. From the Kulliyah's perspective, this workshop is an important mileage in its continuous commitment of strengthening the Islamic Input in its Medical Program.

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The Concept Of Islamic Medical Education And Bioethics

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Abstract:

The concept of medical education, aiming at preparation of the proper Muslim medical practitioner and researcher, is based on the parity between teaching medical sciences and proper upbringing (Tarbiyah).

Tarbiyah is indispensable in preparing medical students to receive medical education.

Tarbiyah derives its roots from the *Tawhid* paradigm of Islam which integrates harmony of matter and soul, body and mind, and emphasizes thinking, contemplation and discovery of new knowledge. The quest for knowledge functions as a means to understand various phenomena of human life, health and disease, and by doing so, worshipping the Creator, the Source of all knowledge and wisdom.

This concept comprises both education, medical conduct as well as bioethics which is a built-in value in the spirit of Islam.

Keywords: *Medical education, Islam, Tarbiyah, Tawhid, bioethics.*

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Introduction:

Medical curricula, in almost all medical schools in Muslim countries, have been following the Western-European styles over the past century.[1]

During the period of Western colonization and subsequently post-independence, educational institutions in Muslim countries have copied and applied Western curricula until the present time.

In some countries, attempts were exercised to add some courses in Islamic medical ethics and the history of past Islamic civilization.

As a consequence there existed this dichotomoy between the teaching of medical sciences and the proper personality building along Islamic beliefs and guidance (*Tarbiyah*). This separation feature of the curriculum has always been a cornerstone of the Western medical education system .[1]

This educational style has achieved significant innovations and progress in the prevention and therapy of many illnesses, but failed in dealing with lifestyle-related dilemmas. The major challenge, however, being in the area of bioethics.

Over the past decades, the world entered into an era of globalization which carried with it a dominant monoculture. In the medical field, this Western culture became controlled by big business which thrives on a culture of profiteering, domination and control, which not infrequently impinges and violates moral norms.

Globalization of health governance has its own philosophical background. Health is considered as a commodity which has a fiscal value..[2] Disease and its therapy becomes pivotal and the holistic care of the person becomes peripheral. It marginalizes preventive medicine, healthcare promotion and only pays lip service to the wellness paradigm.. As a consequence, spiritual and cultural aspects of health are not considered as priorities nor crucial in health care delivery , instead, they only add to the cost of health care.[2]

Inevitably, the medical profession, practitioners, researchers and healthcare leaders included, became increasingly overwhelmed and influenced by this new philosophy of big business in pharmaceutical companies, equipment manufacturers and insurance companies.

Worldwide proliferation of medical inventions and breakthroughs that took place over the past decades, have raised wide hopes and expectations for remedies to many unresolved human ailments. At the same time, they have posed major dilemmas to the Western biomedical model. The medical and scientific world has witnessed a plethora of complicated ethical, religious, social and legal implications. Although codes of medical ethics have been adopted after World War II, yet, unethical practices continued to proliferate.

Humanity has suffered disastrous

outcomes of deviations in the utilization of scientific and technological progress, of which the deviations in atomic energy utilization and environmental calamities are horrific reminders.

The scientific literature has carefully documented the various types of unethical deviations and misconduct in medical practice and research.

One such example took place 40 years in the city of Tuskegee, Alabama, USA. In this study, Afro-American patients suffering from syphilis, were intentionally left untreated from the early 1930s to the late 1970s, in order to study the natural course of the disease in its various stages.[3]

Another ethical dilemma took place more recently in 2009. It is of paramount significance because it involves the global organization that is considered the world authority in setting up of bioethical codes, namely the World Medical Association (WMA)!.

WMA had formulated the **Declaration of Helsinki** in 1964 to uphold bioethical standards of research on humans, and the ensuing Declaration of Tokyo in 1975 included a section on the prevention of any participation of physicians in any torture, punishment or inhuman treatment of prisoners.

Despite that, the president of the Israeli Medical Association was elected as the president of WMA although there was overwhelming evidence to suggest the active participation of Israeli physicians in the torture of Palestinian prisoners.[4]

In fact 725 physicians and researchers, including 114 professors, from 43 countries signed and presented a petition to the WMA council in protest and demanded an investigation of these allegations[5]. The petition was evidence-based and was supported by documents from various local and international NGO's demonstrating the complicity of the Israeli Medical Association in the persecution of Palestinian prisoners.. It is noteworthy that the doctors who enthusiastically led the worldwide campaign were from among British and other Western professors and medical professionals under the leadership of Dr. Derek Summerfield. Until now, the WMA council has not responded to this petition.[6,7]

Medical Education and Tarbiyah:

Medical education aims at the teaching, transfer and sharing of core knowledge and the exploration of new medical knowhow, technology and skills..

Tarbiyah (moral upbringing), on the other hand, aims at building the proper personality, human qualities and values, to enable the future medical professionals and researchers to perform their vital roles in human societies according to built-in ethical codes and values.

Tarbiyah functions to prepare the medical student to receive medical education.

However, the separation of teaching and *tarbiyah* has contributed to the production of unbalanced medical practitioners, with narrow, materialistic and self-centered conducts.[1]

Tarbiyah: The Islamic Concept:

Tarbiyah, in the Islamic sense, derives its origin from Islamic values which harmonize man's relationships with his Creator, fellow humans and environment.

Spiritual nurturing and development aims at the purification of the soul. If the soul is pure, sincere and tranquil, all human behavior and conduct will similarlty follow suit.[2]

The concept of *Tawhid* is the pivotal paradigm of *Tarbiyah*. It integrates the harmony of matter and soul, body and mind, individual parts and the whole.[8]

Al-Faruqi describes *Tawhid* "as the source of truth, cosmic and social order. It insures the unity of truth and, therefore, prevents contradictions between different disciplines of knowledge". [9]

The *Tawhidi* approach integrates medical knowledge, teaching and practice in a wider context, making sure it is in harmony, and is well coordinated with other related medical, or non-medical phenomena. The "integrated" doctor will approach the patient as a whole human, and not just as organs or tissues.

Dr. Ziauddin Sardar aptly stressed the significance of the *Tawhidi* concept[10]: "It becomes an all embracing value when this unity is asserted in the unity of mankind, unity of man and nature, and the unity of knowledge and values. From *Tawhid* emerges the concept of *Khilafah*: that man is not independent of God, but is responsible and accountable to God for his scientific and technological activities…".

The concept that regulated the conduct of Muslims in the pursuit of sciences was precisely this concept of *al-Tawhid*, i.e. the unity of Allah, and His creation.

> *Verily, this brotherhood of yours is a single brotherhood, and I am your Lord and Cherisher: therefore serve Me (and no other).*[11]

Think … Contemplate … and Discover:

When we navigate through the various verses of the Qur'an, we would undoubtedly encounter the emphasis on the necessity of observing natural phenomena. Man is continuously invited to study creation as a handiwork of Allah (SWT), which, in itself, is tantamount to a religious duty and obligation.[12]

The motivating factor behind the Muslims' quest for knowledge in the scientific and medical fields was primarily for them to understand the creation of Allah (SWT), so as to be drawn closer to their Creator.

Seeking truthful knowledge is the Islamic way of education. Truthful knowledge includes calling upon man to think and contemplate about the universe and man's role in this life.

The acquisition of profit and fame are not the primary objectives. They may however come as a byproduct.

In the Islamic concept of medical education, the sciences represent the means to understand various phenomena

related to human life, health and disease, and to understand man's relationship with his Creator, the universe and other creatures.[1]

The following are only a few examples of Qur'anic injunctions to think and contemplate:

> *"On the earth are signs for those of assured Faith, as also in your own selves: Will ye not then see?.*[13] .
>
> *Now let man but think from what he was created!."* [14]
>
> *"Soon will We show them our Signs in the (furthest) regions (of the earth), and in their own souls, until it becomes manifest to them that this is the Truth. Is it not enough that thy Lord doth witness all things?."* [15]
>
> *"Thou seest the mountains and thinkest them firmly fixed: but they shall pass away as the clouds pass away: (such is) the artistry of Allah, who disposes of all things in perfect order: for He is well acquainted with all that ye do."*[16]
>
> *"Do they see nothing in the government of the heavens and the earth and all that Allah hath created? (Do they not see) that it may well be that their terms is nigh drawing to an end? In what message after this will they then believe?."*[17]

In the Islamic concept, human life on this earth has a basic goal: To worship Allah (SWT)

> *"I have only created Jinns and humans, that they may serve Me."*[18]

Medical sciences are proper means to think, contemplate and understand these signs of creation.

Medical students, educated along these concepts from their early days in medical schools, will proceed to acquire balanced personalities, equipped with harmonious outlook of the unity of science and faith.

Science in general, and medicine in particular, is a form of worship and tool for the students' minds to exercise thinking and contemplation in the creation of Allah (SWT).

> *"Men who celebrate the praises of Allah, standing, sitting, and lying down on their sides, and contemplate the (wonders of) creation in the heavens and the earth, (With the thought): "Our Lord! not for naught Hast Thou created (all) this! Glory to Thee! Give us salvation from the penalty of the Fire."*[19]
>
> *"Those truly fear Allah, among His Servants, who have knowledge: for Allah is Exalted in Might, Oft-Forgiving."*[20]

This kind of *Tarbiyah* is instrumental in the evolution of medical practitioners, scientists and researchers who comply with the divine guidance to discover sound basis of health and disease, to exert the needed diligent effort to investigate, discover and remedy human disease, and in doing so, to discover Allah's healing, power, wisdom and perfection.

Through uncovering these secrets,

Muslim practitioners and scientists devote themselves to the worship of Allah (SWT) through saving human lives and alleviating human sufferings and miseries, and in doing so, endeavor to uphold their role as the vicegerent of Allah on this earth.

Medical sciences uncover the fact that everything in this universe, including humans, were created in the best of moulds, in utter perfection, with specific roles in this life. Man benefits from the other creations of God and utilizes them appropriately. Whenever this utilization is contrary to their creation, any deviation or mis-utilization becomes a form of abuse and destruction, which creates mischief and evil in human society.

The Islamic concept of medical education is geared towards embracing a holistic outlook to life and all creations.[8] Various substances, issues and practices are looked upon in a holistic manner. Their nature, constituents, origins and how they were created in the shape we encounter them, all are considered inclusively and comprehensively.

Medical students do not need to go to a special institution to be taught religious faith. They could be taught in their medical schools and by the same teachers, side by side with the other sciences.[1]

Without this kind of holistic curriculum in medical education and training, medical schools may produce practitioners and researchers who may be well versed in sciences, but with hollow conscience and empty faith which will dominate their attitude and performance towards patients and society.

Medicine: Fardh Kifayah: [21]

Most past Muslim jurists and scholars considered the medical profession as the most noble and dignified career that is only second to specialization in sciences of Qur'an and *Sunnah*.[22]

In view of the vital role of the medical profession in society, Muslim scholars considered it a *Fardh Kifayah*, i.e. a religious duty that the whole society, or Ummah, will be held guilty and sinful, if it failed to induce and support some of its members to become medical professionals.

Some Muslim scholars went further by advocating relief of medical liability against qualified medical professionals because of un-intended medical mistakes, when there is no proven neglect.[23]

Medicine is closely associated with all five purposes of the law (*Maqasid al-Shari'ah*): Up keeping of and preserving religion, life, mind, progeny and wealth.[2]

Intention (*Niyyah*), together with commitment and motivation, are hallmarks of sound attitude of the medical student, practitioner, researcher, faculty members and administrators.

This concept will create a sound and healthy attitude in all concerned to reject all forms of negative values, including

falsehood, obscenity and corruption.

Seek remedy[24]:

The injunctions of the Glorious Qur'an and *Sunnah* of the Prophet (PBUH) to seek remedy from ailments, constitute a system in medical care and research.

Let us study the implications of one Prophetic *Hadith*:

" For every disease there is a cure" or its other version "seek remedy, for verify, Allah has not created a disease without providing its cure...".[25]

First: There is an injunction to seek cure from illnesses.

Second: There must be well trained and qualified medical practitioners to provide medical care.

Third: All diseases, including lethal ones, or diseases considered incurable in our current level of knowledge, have curable remedies which are unknown to us at the present point in time. Allah (SWT), the source of all knowledge, has not revealed them to us yet. We need to exert more efforts of research, perseverance and mental process to discover their cure.

A medical student nurtured with this attitude of openness, research and discovery as an integral part of his faith, will grow and develop into the practitioner or researcher, that the Muslim society, and humanity at large needs.

Bioethics:

Medical bioethics is the application of recognized principles and standards in making decisions towards medical practice and research.

The last decades have witnessed major scientific and medical achievements and breakthroughs, with significant, unprecedented influences on human life and health.

Across the world, complicated ethical, religious, social and legal implications have arisen.

Ethical councils and organizations have been established worldwide, which recognized standards that regulate medical and research behavior.

The flood of non-ethical conduct, together with the influences of globalization and big business on medical practice and research have created major bioethical challenges to the scientific fraternity.

In most Islamic countries, medical institutions lack sound curricula on bioethics and biomedical jurisprudence.

Past Muslim jurists had pioneering roles in bioethical issues derived from Islamic Jurisprudence. They had comprehensively addressed all medical issues and developments of their times.

Virtually all medical issues were addressed by jurists over the extended centuries of Islamic scientific civilization.

Over the past 3-4 decades it was noteworthy to witness the close collaboration and understanding between jurists and experts in medical-scientific issues.

We currently have a considerable

and valuable wealth of biomedical jurisprudence that we have acquired from our predecessors, which we continue to build upon.

Islamic Bioethics cannot be divorced from morality, and can not be separated from *Shari'ah* (The Islamic Law). [8]

What we call "Islamic Medical Ethics" is the same general ethical standards, using medical terminology and with medical applications.

The basic moral and legal codes are derived from the Islamic Law (*Shari'ah*).

The detailed applications, however, require further intellectual effort: "*Ijtihad*".

The principles of justice, autonomy, beneficence and non-maleficence are derived from the broad principles of *Shari'ah*

Islamic bioethics is based on the supreme guidance of Allah (SWT), and is faith-centric.

The spirit of Islam is translated into the practice of medicine and research through the codification of divine revelations into regulations referred to as the *Shari'ah* or Islamic Law. *Shari'ah* is the epitome of the Islamic spirit, a manifestation of the Islamic way of life.

The late professor Ismail al-Faruqi was quoted as saying:

In Islam, ethics is inseparable from religion and is built entirely on it. The Islamic mind knows no pair of contraries such as "religious-secular".

The universe, according to Islam, is teleological in the sense that it is based on the belief that the world was created for a divine purpose. Hence, "Nature is equally a realm of ends where everything fulfills a purpose and thereby contributes to the prosperity and balance of all". [26]

Conclusions:

The Curricula for medical education, research, *tarbiyah* and bioethics should proceed concurrently, hand in hand, beginning from the early stages of all teaching and training programs in Islamic medical institutions.

The vision of medical education and Tarbiyah is to mould medical practitioners and researchers with balanced, dynamic and wholesome personalities, owing total allegiance to Allah (SWT), and imbuing in themselves the sense of responsibility and accountability.

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Ethical Issues Related To Medical Education
In The Light Of Islamic Principles

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Abstract:

Ethical dimension of Medical education necessitates a dedicated perception of explicit moral codes, delivering medical knowledge and training of medical professionals, not only at undergraduate and postgraduate levels, but till the end of one's professional life. Going back in history, we find that Islamic culture is most fascinating, complex, and dynamic in the world. Medical knowledge remained the vital part of learning objectives even as early as the time of Prophet Muhammad (PBUH). Muslim medical scholars contributed a great deal in imparting medical knowledge to every student irrespective of race, religion or ethnic group. Medical ethics is one of the important subjects stressed in modern age medical education. However, it is by no means the Islamic ethics. Islamic ethics is far superior than the "medical ethics" as it protects both medical practitioner and the patient, not only from the sins of worldly standards but those of divine standards too. Unfortunately medical ethics is not an essential part of medical curricula of most of the universities and medical schools. The learning behaviors and modalities of delivering medical education need certain ethical precincts. These ethical boundaries are well drawn by Islamic education system. During the selection process of a medical student and of a resident for higher training, the main criterion should be that leaders of the future are being selected. Physicians may be leaders of people, whose moral principles and attitudes should be a role model for the society. The most significant constituent of an effective curriculum for a Muslim doctor is the integration of behavioral changes based on truthful understanding of Islamic medical ethical values. A curriculum is never inclusive and up to the mark if it is lacking fundamental ethical issues pertaining to medical practice with special reference to faith, knowledge and practice of faith. Medical curriculum must also meet the requirements of the society. In Muslim countries, very little has been done in the postgraduate curricula and training programs. Though it has been greatly emphasized in Islam to acquire knowledge at an incessant pace, little has been done for continuous medical education and personal development of doctors. A medical teacher is fully aware of the fact that he is the responsible role model for his students and graduates. All efforts and techniques to prepare and train a Muslim medical professional will be fruitless, if the educational environment and intellectual disposition of a medical educational institution and teaching hospital are not in accordance with Islamic teachings. The doctor must seek and advance his knowledge until the end of his life. To attain an exceptional level of knowledge, continuing education is essential, so that the scholar's knowledge will be functional for all communities.

Keywords: *Ethics, Islamic ethics, medical education, curriculum, continuing medical education.*

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Knowledge and Medical Sciences

Learning and teaching has been greatly stressed in the Qur'an in various revelations. The very first revelation of Qur'an commanded to read and learn: *"Read in the name of your Rabb who created, Created man from a leechlike mass. Read, your Rabb is the most Gracious Who taught by pen; taught man what he knew not.*[5].

Right at the time of creation, Allah put all the knowledge in the human brain *"He taught Adam the names of all things then he presented to angels and said: "Tell Me the names of these if what you say is true?"*[6]. Man only has to re-discover all what he has already been taught and this phenomenon is continuing. Muslims are the only Ummah today that possess the first right to this knowledge provided they strive for it. The Prophet of Islam stressed the learning and acquiring knowledge in various ahadith "*Learn from infancy to death (Muslim)*" The importance of learning for the Muslims can best be judged from the fact that when prisoners of war were taken into custody by Muslims in the first ever battle between the Islamic state of Medina and nonbelievers of Makkah at Bader, the Prophet (PBUH) ordered the prisoners of war to educate 10 Muslims of Medina to get freedom without any ransom (Fidyah). Prophet Muhammad (PBUH) said: "*The seeking of knowledge is obligatory on every Muslim…*"[7]

"If anyone travels on a road in search of knowledge, Allah will cause him to travel on one of the roads of Paradise." "The angels will lower their wings in their great pleasure with one who seeks knowledge", "the inhabitants of the heavens and the Earth and the fish in the deep waters will ask forgiveness for the learned man". "The superiority of the learned man over the devout is like that of the moon, on the night when it is full, over the rest of the stars". "The learned are the heirs of the Prophets, and the Prophets leave neither dinar nor dirham (money), leaving only knowledge, and he who takes it takes an abundant portion."[8].

The text of the Qur'an is rich with verses inviting man to use his intellect (mind, intelligence), to ponder (contemplate), to think and to know. To Muslims, "the goal of human life is to discover the Truth which is none other than worshiping Allah in His Oneness." Prophet Muhammad (PBUH) in his hadiths provide very rich source of references to the importance of seeking knowledge, from wherever it might be found. During most of its history, Islamic civilization has been witness to a true celebration of seeking knowledge. That is why every traditional Islamic city possessed public and private libraries, and some cities like, Qurtoba and Baghdad, boasted of libraries with over 400,000 books. Scholars have always been held in the highest esteem and respect in Islamic society.[9]

There is a famous saying; "Knowledge is of two types: the knowledge of the religion and the knowledge of the human body".[10] Therefore studying

human body is a source of recognition of Allah's power and is a source of opening new chapters of the universe which Allah has created. Several quotations from the ahadith of the Prophet (PBUH) greatly emphasise acquiring and dispersing of knowledge. Scholars should endeavor to spread knowledge and provide education to people who have been deprived of it. For, where knowledge is hidden it disappears." Someone asked the Prophet: "Who is the biggest scholar?" He replied: "He who is constantly trying to learn from others, for a scholar is ever hungry for more knowledge." "Seek knowledge and wisdom, or whatever the vessel from which it flows, you will never be the loser". These and many other quotations from the sunnah of Prophet Muhammad (PBUH) have much relevance to human life and duty of every one who believes in Allah and His prophets.[11]

Traditionally, knowledge is divided into two main portions:

Applied sciences such as chemistry, physics, medicine and agriculture which should be connected to the experimental methods. This knowledge and its application are not strictly guided by the Qur'an and Hadith, provided it does not conflict with broad teachings of Islam. As narrated by Raf'e bin Khadeej, the Prophet's idea about pollination was disagreed with by some experienced farmers. The Prophet (PBUH) then said: "I am but a human being; you take whatever I command you of your religion. Whatever else I command you of the world's affairs are of my own opinion, I am not but a human being." In the narration of 'Aisha, (RA), "...you know best of your own life affairs."

1. The knowledge of religion, however, can not be accepted from other than divine sources. The knowledge related to faith (*Aqeeda*), such as the knowledge of the Islamic law, religious observances, values and general concepts of the universe, human soul, and the social system, can only be obtained from the sole divine source. This type of knowledge cannot be achieved by experimental and inductive methods, for two reasons. One, in studying the relationship between two variables, it is not possible to achieve voluntary control of the factors affecting these variables either by confirmation or change of postulates; while this could be achieved in applied sciences e.g. the effect of heat on iron. Second, the study of these sciences does not yield the same results if repeated in the same way and in the same circumstances, whereas in applied sciences this is not the case e.g. iron expands each time when subjected to heat.

2. Islamic faith dictates that man is distinguished from other creatures in that he is endowed with the Divine Breath which has granted him will, power and knowledge. Therefore, due to man's free will,

nobody can positively predict his behavior towards certain situations in a scientific manner. Tests on humans are not always reproducible. However, if the human behavior is strictly guided by the principles laid down in the divine source, then it becomes predictable. The Muslim should not, therefore, receive his codes of behavior or the ethics of his society from non-Islamic sources[12] Allah says; *"Therefore shun those who turn away from our Message and desire nothing but the life of this World. That is as far as knowledge will reach them. Verily thy Lord knoweth best those who stray from His path, and He knoweth best those who receive guidance."*[13]. It is the responsibility of a Muslim to seek the correct way of life and to rightly guide others to the righteous way of life: *"Ye are the best of peoples, evolved for mankind, enjoining what is right and forbidding what is wrong, and believing in Allah."*[14]. There is great reward of acquiring knowledge and graded very high in the verses of Qur'an:

"Allah will exalt in degree those of you who believe, and those who have been granted knowledge. And Allah is Well-Acquainted with what you do". [15]

Medical education combines these two groups of knowledge; applied sciences and humanities Its application is on humans by humans whose behavior has to be guided by the divine source. Therefore a Muslim doctor needs to be different from a non-Muslim doctor (not by appearance alone but by virtues and deeds). He must be fully aware of his obligations both to the patient and to Allah. The process of raising such a doctor is long and tedious.[16]

Medical ethics is one of the important subjects stressed in modern era medical education. However it is by no means the Islamic ethics. Islamic ethics is far more superior than the "medical ethics" as it protects both doctor and the patient not only from the sins of worldly standards but those of divine standards too. A medical school that claims to be a pioneer of Islamic ethical values must observe certain standards right from the beginning. The educational contents and the delivery system should be designed according to the divine guidance and must reflect the requirements of the society at large.

Acquiring medical Knowledge, dispersing it and practicing medicine remain an integral part of the Muslim society.

Imam Al-Shafei said: "I know no nobler science than medicine except the sciences of religion".

Medical education remained an essential part of learning and teaching in the Muslim society from its very early days. Medical education, despite being a specialty, is but one fiber in a whole mesh founded on the belief in Allah, His oneness and absolute ability, and that He alone is the Creator and Giver of life, knowledge, cure from ailments, death, this world and the hereafter. In planning the making of a medical doctor, a prime goal is to

make him a living example of all that his Creator loves, free from all that Allah hates, well saturated with the love of Almighty Allah, of people and of knowledge. [16]

There is not a better way to translate the theoretical aspects of medical ethics than to prepare an ethically motivated doctor. Medical ethics is not an essential part of medical curricula of most of the universities and medical schools. The learning behaviors and modalities of imparting medical education need certain ethical boundaries. These ethical boundaries are very well drawn by the Islamic education system. In the framework of good educational methodologies, certain responsibilities lie on the educational system, curriculum, teachers, students, learning environment and pedagogical methodologies. This list is never exhausted and needs continuous upgradation and modification according to the emerging requirements. Teaching and training of medical students to upbring good Muslim doctors is the prime responsibility of all those who are involved in medical education programs and their implementation. The knowledge and expertise which a Muslim medical practitioner or academician acquires is a bounty of Allah (SWT) and he/she will be asked about all bounties bestowed to him/her. Imparting obsolete knowledge and training doctors through outmoded methodology does not match the demands of *taqwa* (God fearing). Achieving excellence in academia is the prime responsibility of a Muslim medical teacher. *"The reward of every excellence is excellence"*[17] Inferior quality of medical training and education at under or postgraduate levels is a deviation from Islamic teachings. In the history of Islam, Muslim medical teachers always kept their students with them during their practice hours. They used to learn and acquire the behaviors of their teachers and used to follow what they learn directly from their teachers. At the same time they were researchers and innovators thus contributing directly to the progress of medical knowledge and expertise. Ethical dimensions of medical education commence right from the time of selection of the students to train them as medical doctor or for post graduate residency programs.

The selection criteria in Medical School

The selection and training of medical students should emphasize services within the Islamic system of mutual social support. During the selection process the main emphasis should be that we are selecting leaders of the future, whose moral values and attitudes should be a role model for the society. A medical institution should aim to train physicians who must be able to conduct research to extend the frontiers of knowledge. The process of training at undergraduate and post graduate levels must motivate the

future physician to excellence and commitment following the model of the early Muslim physicians. Therefore the selection of the undergraduate and postgraduate candidates must be strictly on merit cum aptitude basis. The selection criteria, including entry tests and interviews, must be designed in accordance with the best Islamic ideological concepts, reflecting the best practical examples of Islamic justice and competency. The selection system must be just and in accordance with the entire objectives of medical education described elsewhere. [18]

Curriculum

Curriculum must be designed to achieve pre-defined competence. Competence includes a broad range of knowledge, attitudes, and observable patterns of behaviors which together account for the ability to deliver a specified professional service[19]. Professional competence is the habitual and judicious use of communication, knowledge, technical skills, clinical reasoning, emotions, values, and reflection in daily practice to improve the health of the individual patient and community[20]. Competency is a complex set of behaviors built on the components of knowledge, skills, attitude and competence as a personal ability [21].

A modern medical curriculum needs frequent evaluation based on continuous audit and performance-based efficacy of the curriculum matching with set goals and mission of the institutions where it is applicable. The curriculum must be a source of transmission of competent knowledge and acquiring required skills. The most important component of an effective curriculum for a Muslim medical practitioner is to incorporate behavioral changes based on correct understanding of Islamic medical ethical values. This includes, not only sound knowledge of medicine and its proper application, but necessarily includes ethical issues in Islamic perspective without which the essence of good curriculum can never be achieved. In addition to the competencies defined in medical science e.g. effective communications, performing basic clinical skills, application of principles from biomedical, clinical and behavioral sciences and epidemiology in the practice of family medicine; it must include management of specific health issues related to Muslim faith and practices. For example, while examining or operating upon the patient, how much intimacy and exposure is essential, whether in a given circumstance family planning and abortion are permissible, whether a porcine product can be used to treat an ailment, and many others. The curriculum must be a methodology rather than reflection of accumulation of scientific information and there must be an early student involvement in direct health care delivery system as a part of the curriculum and the education strategy.[22]. Biotechnology and genetics (cloning, stem-cell…etc) from an Islamic perspective should be part of the curriculum. The Islamic approach to the prevention of HIV-AIDS and

other sexually transmitted diseases as well as the rapidly increasing diseases like cancer, cardiovascular, respiratory, digestive and other diseases should also be included. The Islamic life style and its role in the prevention of cardiovascular and other diseases should be part of the curriculum, as well as the effect of prohibited food, intoxicants, and the different food ingredients on human health and behavior. The Islamic perspective in neurosciences, obstetrics and gynecology, human reproduction, sex education for Muslim youth and their parents should also be included, The Islamic perspective on geriatrics, health promotion through life styles, the Amman Declaration, WHO community health guidelines should be also included, The Islamic ruling on smoking, the Islamic perspective on environmental health, should all be part of the curriculum. Medical school curricula should comprise the teaching and study of the "Islamic Code of Medical Ethics". Medical School curricula should emphasize that medicine is worship both as an approach to belief by contemplation on the signs of God, as well as from the applied aspect by helping man in distress. Medical school curricula should include the teaching of matters of jurisprudence and worship pertaining to or influenced by various health aspects and problems, as well as of Fiqh (Jurisprudence) rules pertaining to medical practice, research and development.

A curriculum is never comprehensive and up to the mark if it is lacking basic ethical issues pertaining to medical practice with special reference to faith and knowledge of the practice of faith. The issues of professional ethics need to be included in basic as well as in clinical sciences. Moreover a holistic curriculum must include the core Islamic references, history of Islamic medicine, contribution of Muslim scholars in research and development of medical knowledge and expertise, as well as health guidelines from the *Qur'an* and the *Sunnah* of the Prophet (PBUH). Ethical values specially emphasized in *Qur'an* and *Sunnah* of our Prophet, rights of the sick person in particular and human rights as described in *Qur'an*, *Hadith* and Islamic literature should be stressed. Medical school curricula should familiarize the student with the medical and other scientific heritage of the era of Islamic civilization, the factors underlying the rise of Muslim civilization, those that lead to its eclipse, and the way(s) to its revival.[23]

Medical curriculum must also meet the requirements of the society. The curriculum must address the common problems of the society and must not be adopted as such cooked by the Western institutions for their own use. The stimulation for research based on loco-regional issues and issues of the Muslim Ummah must be included in the curriculum. Thus at all levels of the physician training, the aim of acquisition of values, attitudes, and ethics must be existing. At the national level, training of both Muslim and

non-Muslim physicians within an institution based on Islamic teachings will contribute directly to a moral and ethical change in the national health care delivery system.

The Islamic teachings related to the understanding and practice of medicine must be an integral part of concepts rather than patching these teachings to the curriculum, and must be directed at supplying conceptual tools that make the scientific study of medicine and its methodology deeper, universal, and objective. The dichotomy that exists in many Muslim institutions of higher learning should be removed such that there are no religious sciences distinct from non-religious ones. The Islamic input should be fully integrated into the medical curriculum and should preferably be taught by the same professors who teach other medical subjects. Moreover, our professionals have to be trained to international standards such that they can work anywhere in the world.

In Muslim countries, very little has been done on postgraduate curricula and training programs. Though acquiring knowledge with a continuous pace has been greatly emphasized and stressed in Islam, little has been done for continuing medical education and personal development of doctors. Our medical institutions must adopt a regular system of training and education with special reference to our loco- regional requirements without marginalizing the international needs and requirements. Training of Muslim doctors for specialization and superspecialization mainly depends upon the Western institutions. Muslim countries, inspite of having some training programs in their institutions, are lacking properly designed training programs with special references of Islamic ethical values. Moreover, knowledge duplication and consumption of techniques are so prevalent in our societies that we even do not bother to look into those programs which are designed in a set of reference for particular reasons, in particular ethical framework and in secular environment. This ultimately creates contradictions and conflicts among our trainees and we have been neither able to prepare Muslim nor non Muslim specialists. Our doctors need to be trained with clarity of mind, sound faith and up-to-date expertise in their respective fields. Our continuing medical education programs, as a requirement of a faithful and correct doctor, must also include continuous upgrading of knowledge of ethical issues including ethics of human and animal research in addition to new developments in medicine.[24]

Pedagogical methodology and the learning process in medical institutions:

The teaching methodologies and pedagogical instruments in medical schools must be designed in such a fashion that these techniques should reflect Islamic ideology and Islamic way of life. Any uncertain ways and

means of communication should not be used.

Teaching modules must include effective modalities of learning, must not be overwhelmed by authoritative behaviors, and students must be provided with a good chance of self learning and thinking and pondering upon the best creation of Allah that is the human being.

"We have indeed created man in the best stature; then we abase him to the lowest of low; except those who believe and do good deeds- for they shall have never ending reward."[25]. *"Those who remember Allah while standing, sitting and lying on their sides, and meditate (think and ponder upon) the creation of the heaven and earth, then say: Our Rabb You have not created this in vain, glory to You Save us from the punishment of fire"*[26].

Our teaching effort must stimulate our students to think and to ponder upon the creation: its structure, functions, purpose of creation and if a person deviates from the actual purpose of creation or misuse his body, what type of disease could develop in his body and soul.

Moreover, our pedagogical efforts must reflect the evidence- based practice of medicine, which is the true Islamic medicine. There is no doubt medical practice needs continuous evolution and continuous assessment of its performance. There are several modalities of medical education programs and none of the teaching or instructive methodology is perfect to produce the needed doctor meeting health challenges. Therefore all sorts of curricula are in continuous evolution and rearrangement in search of the best possible means of instruction to produce the required doctor. In Islamic teaching there is one very important instruction to all human beings and to the doctors in particular: " the rewards of excellence is excellence". One must perform his job in such a way that he tries to achieve excellence in his profession. Our Prophet said that "a Muslim does his job in the best possible way"[27]. These instructions enlighten us to secure the best possible means of transmission of our medical knowledge to our successors with excellent ways, which is *"amanah"* (trust) with us. Whether we adopt the new trends in medical education, like integrated teaching, problem based learning or student centered learning, or adopt our own ways of instructions and teaching modalities based on our own situations, we must achieve excellence and that is one of the dictates of our religion.[28]

At the same time, our curriculum and teaching tools should not be fragmented and sanctioned leading to crowding of minor things and leaving behind, or less emphasizing, the practical contents. The specialization and super-specialization might be a good effort but we need to know why the people in the West are not satisfied by methodology of instruction and training programs of the doctors and came up with the ideas of vertical and horizontal integration among different

disciplines of medicine, and developed the problem centered approach. One must clearly understand that integration is not just putting two or more disciplines together. It is a fundamental philosophical attitude based on a vision and a guiding paradigm. Only Islam, which has holistic approach to life and universe and every thing in it, can provide this paradigm. Not knowing this paradigm, people without faith are lacking equilibrium as a secondary manifestation of lack of integration. A lot of human illness is due to lack of balance and equilibrium. Among different teaching models in practice in the western countries, the disease study model is predominating. The bias to the disease model explains Western medicine being more curative than preventive. Since the ultimate goal of our effort is health, every model must be health oriented and not disease oriented. This attitude has developed in the West because of their negative attitude towards disease, while illness to a Muslim has its positive aspects and can be a blessing and reason for expiation of sins. When viewed in a larger context, illness need not always be seen as bad. Falling sick, may save a person from going where he would be hurt more seriously or where he could commit a sin. In certain instances, alarming signs give indications of tissue damage and can be helpful in managing symptoms. For example, pain is an indication of tissue damage whether actual or impending. Fatigue is the body's way of forcing us to rest when we are over-stressed or overworked without adequate rest. Much of what manifests as disease is the body's attempt to return to natural or normal form. Moreover Islam asserts that the ultimate cure of illness is from Allah. Man can only put his maximum effort to alleviate the suffering with best possible medical art and knowledge.[29]

Islamic medical education aims to achieve the supreme purposes (*Maqasid*) of *al- Shari'ah* described in Islamic jurisprudence i.e. protection of religion, life, procreation, intellect and property. The Medical profession is the only profession involved with all five purposes. Therefore, medical education must produce such doctors who, in their practice, will fulfill these purposes within holistic context. They should be health oriented.

This approach can only be applied to produce a desirable doctor who has a *tawhidi* (Unity of ALLAH and His creation) approach to integration. He/she places the medical knowledge, teaching and practice in larger context to making sure it is in harmony with other related medical or non medical spheres of knowledge. This purpose of medical education could be achieved by holistic view of medical education, including selection of students into the medical schools, changing and reforming curriculum, emphasizing basic methodological and conceptual issues, and involvement of students from their early days of medical schools as were practiced by prominent Muslim physicians in the early Islamic

era. Besides acquiring knowledge and skills, medical education imparts attitudes and assumptions. These are part of the non factual learning that students acquire by watching their teachers.

A system under control of the medical school should ensure systematic continuing medical education acknowledging the fact that much of what is taught is soon overtaken by new medical discoveries in rapidly changing knowledge and results of research and innovation in medical sciences. Medical education must shift from traditional teaching system to character building along with producing competent doctors who acquire the qualities of IMAN (faith- *Tawhid*, *Adl*, *tafakkur*, *Taqwa* (God fearing), *Amanah*: (commitment, sincerity of intention and quality of work), and *Akhlaq* (best moral attitudes).[30]

Medical education must be research-based and should be in the process of continuous evoluation. Islamic approach to medical education provides wide scope of research even for diseases where we do not know the proper pathophysioplogy and cure. As the *Qur'an* denounces blind following and imitation (*Taqlid*), this attitude provides great motivation for research and a Muslim doctor knows that his scope of research is wider than a non believer, knowing the fact that understanding more signs of Almighty Allah leads to even more Iman. A Muslim doctor strives to know more about Allah's signs to become closer to Him.

The physician of the future will have to change easily between interrelated roles of research and innovation, clinical and preventive work and medical education. A doctor is also a social worker without which he can not perform his other functions. All these duties can be performed by correct time management. A medical education system must be designed in such a way that a balance is created among medical research, education, clinical, preventive and social work. A researcher, who is a clinician, knows basic problems in his day to day practice A teacher and clinician knows these problems better and knows how to put maximum effort to come up with better solutions of these problems based on his studies and research.

The Teacher as a Role model

The purposes of any education process can never be achieved until teachers or facilitators imparting such education or training are fully equipped with required knowledge, expertise and attitude required for that particular education process. A medical teacher should be fully aware of the fact that he is the responsible role model for his students and graduates. He should be fully aware of the fact that to learn and acquire the state of the art educational techniques and pedagogical tools is essential for a God-fearing medical teacher. The medica1 teacher owes his students the provision of the good example, adequate teaching, sound

guidance and continual care in and out of classes, before and after graduation. Medical education is neither passive nor authoritarian. It aims at sparking mental activity, fostering observation, analysis and reasoning, development of independent thought and the evolvement of fresh questions. Stagnation of medical knowledge is strongly condemned in Islamic teachings, continuous and enhancing of medical knowledge and expertise to provide best medical care to patients and society can only be possible if the teacher is well versed with these techniques and capable of efficiently transmitting to his students at undergraduate and postgraduate levels. Medical education has to be purified from every activity towards atheism or infidelity, yet it picks from all trees without refractoriness or prejudice.[31] Only following out-dated ideas and methodologies learnt from a teacher years ago and not adopting the newest better ideas , is strongly condemned in Qur'an "*As such we have found our fathers and we will follow on their footsteps*"[32]. This is the reason that the Muslim teacher is progressive and forward looking rather than developing an attitude which is only conducive to stagnation and arrest of progress. A Muslim medical teacher is a role model for his students and his life reflects the Islamic behavior. "*For surely I have been sent to be a teacher.*" [33]. An attitude that "Faith" is remedial, a healer, a conqueror of stress and a procurer of cure is needed. The training of the doctor should prepare him/her to bolster "Faith" and avail the patient of its unlimited blessings. This can only be done if the medical trainees acquire sound knowledge of Islam related to medicine and health sciences, as well as comprehensive and uptodate knowledge of Medicine and related arts. Thereafter he must develop the abilities to decide and implement medical knowledge within the frame of Islamic medical ethics.[31]

Conducive Environment of Medical School/ Institution:

All efforts and techniques to prepare and train a Muslim medical professional will be ineffective if the educational environment and academic atmosphere of the medical educational institutions and teaching hospitals are not in harmony with Islamic teachings. All medical institutions, including teaching hospitals and allied specialties, must follow and adopt Islamic ideological values with correct understanding of their application without any reservations. It is impossible to import education in a secular environment and prepare a true Muslim doctor who could acquire all qualities of a good Muslim in general and good Muslim doctor in particular. At least a medical institution must follow the policy of avoidance of improper and unnecessary *ikhtilat* (mixed sex gatherings), proper Islamic dress code, lay out of the institution, separate civic facilities for male and female staff, etc. The campus must reflect Islamic symbols and there

must be complete obedience of Allah and His messenger, respect to Islamic values and norms.[24] All anti Islamic and secular elements indicating *shirk* (associating partners with Allah) must be removed from the premises, otherwise a severe contradiction may develop among the minds of students. It is against the teachings of Qur'an to say something and not do accordingly. *"O' believers! Why do you say something which you do not do? It is very hateful in the sight of Allah that you say something which you do not do"*[34]. There must be a complete harmony and concordance between their sayings, admonitions and practice. Campus of a medical institution should be self-sufficient in all basic needs for training of doctors in Islamic environment, and self-contained with most modern and state of the art educational instruments, including clinical materials. Clinical and basic sciences must be fully furnished with required equipment so that training could be imparted with up to the mark standards. The Islamic medical education is evidence-based, modern, ethical and efficient. A Muslim doctor should acquire all those qualities to achieve these goals. The educational premises should be conducive for the implementations of Islamic ethical values.

Continuous Medical Education (CME)

Medical knowledge is ever expanding and medicine is one of the fastest advancing fields of sciences. In the past, Muslim medical scholars were the source of expansion of medical knowledge and expertise, and played crucial roles in creating and dispersing knowledge. Over the past five hundred years, Muslim medical professionals gradually lagged behind. Medical practice has become the means to attain a distinguished position in society and to gain profitable earnings. Mostly medical professionals in the third world are neither creative nor the source of enhancement of medical knowledge and expertise. To remain at the cutting edge of knowledge and expertise, Muslims doctors will have to acquire medical knowledge more persistently and continuously.[35]

In their pursuit to acquire and increase their knowledge, Muslim doctors are following the example of the Prophet (PBUH) who is taught by the Qur'an how to invoke Allah saying

> *"O my Lord! Advance me in knowledge."*[36] .

The Prophet (PBUH) used to pray; "O, my Lord, I seek refuge of you from four: non-useful knowledge, an unfearful heart, an unsatisfied soul and an unanswered prayer."[37] .

Continuing medical education is mandatory for every Muslim medical practitioner, He is not at liberty to shun passively such a pursuit. The Prophet (PBUH) said; "Seeking knowledge is a duty prescribed on every Muslim."[38] Allah will raise up, to (suitable) ranks (and degrees), those of you who believe and who have been granted knowledge".[39]

In order to achieve this high rank, there are prerequisites for the scholar of knowledge to fulfill, the most important of which is for his knowledge to be intended for the pleasure of Allah and for the best interest of Islam and humanity.

If the duties of religious observance have maximum limits to attain completeness, seeking knowledge, on the other hand, has no limits, and extends into man's entire life. The Prophet (PBUH) said; "*The faithful will never be fully satisfied of the good he hears, until his final goal is paradise.*"[40] .

If knowledge is related to the health and safety of Muslim Ummah, and humanity at large, as well as preserving the aims of Islamic legislations, as such is the case in medical sciences, then perfecting and becoming advanced in such sciences is more of a priority and a duty. In this contexts, acquiring medical knowledge is necessary from Muslim or non Muslim countries. In acquiring such knowledge a Muslim doctor must adhere with the massage of Islam and divine guidelines.[44]

The doctor must seek and advance his knowledge until the end of his life. He must be a source of inspiration for the coming generations. He must always and persistently explore new and better diagnostic and therapeutic tools for his time and times to come. His additions in knowledge and expertise would then be a running charity to be rewarded for, even after his death. The concept of Islamic message should be acknowledged by every scholar of medicine. He/she has to seek knowledge for the cause of Allah, with no regard to achieving material welfare or distinguished social status. But if he/she intends to study medicine for the sake of mean ephemeral worldly aims, the Prophet (PBUH) warns him in the *hadith* narrated by Abu Huraira; "*Whoever learns a knowledge, that of which Allah's sight would be sought, to seek a worldly benefit, will never find the fragrance of paradise on Doomsday.*"[42].

Acquiring knowledge and practicing medicine should entirely be to please Allah and for the cause of Islam though the byproduct could be earning or status but these should not be the major aim of a Muslim doctor. And therefore acquiring knowledge raises the degrees of people to the highest ranks of faith, righteous work and Jihad (holy cause). Allah says; "*We gave (in the past) knowledge to Dawod and Solaiman: And they both said: "Praise be to Allah, Who has favored us above many of his servants who believe!""And Solaiman was Dawod's' heir. He said: "O ye people! We have been taught the speech of birds, and on us has been bestowed (a little) of all things: this is indeed Grace manifest"(from Allah)*[43].

It is therefore required to achieve this high rank, and all those prerequisites for the scholar of knowledge. A Muslim doctor is aware that he has to make a continuous research and enhance his diagnostic and therapeutic skills to find out the treatment of all those incurable conditions as an application of the Prophet's saying; "*Seek remedy for*

verity, Allah has not created a disease without providing its cure ...." [44]

Many eminent Muslim scholars believe that acquiring technical knowledge in the best interest of the society is *Fard Kifayah*. This is an act in *Shari'ah* that is not essential for every one. If few or some persons from the society do that job it is being accepted by Allah (SWT) from the whole society. In this list of technical knowledge essential for the society, medical knowledge is on the top[31,41]. In fact, acquiring medical knowledge and dispersing it is in the best interest of humanity and is a means for strengthening one's faith (*Iman*). *"Such is He, the Knower of all things, hidden and open, the Exalted (in Power), the Merciful; He Who has made everything which He has created most well: He began the creation of man with (nothing more than) clay."*[45].

At the end, one must always pray to Almighty in accordance to *Sunnah* of our Prophet for al-*ilm al-nafe* (knowledge which is useful in this world and in the hereafter). It becomes a compulsory segment of one's professional life to acquire current medical knowledge and expertise for the best care of his patients and his society and humanity. Perfecting his profession to preserve peoples' lives in compliance with Allah's command to colonize the universe and to serve humanity at large is a duty for the Muslim physician. The concept of Islamic message should be acknowledged by every scholar of medicine. To attain an outstanding level of knowledge, continuing education is essential, so that the scholar's knowledge will be most useful for all communities. It is the tool to provide the best possible care to one's patients and to meet Allah knowing that one has done his share to improve the lot of fellow human beings.

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Muslim Contributions To Research: Past, Present And Future

Tayyab Hassan, Afshan Khan, and Abdul Rashid Abdul Rahman*

Abstract

Islamic contributions to medical research are indeed unquestionable. Although these contributions have remained hidden from western public domain for a very long time, attempts have been made by the international scientific community to slowly, but surely acknowledge the contributions made by Muslim medical scientists and doctors of the past. However this acknowledgment is tainted with the innuendo that those were historical contributions with very little contemporary relevance. Indeed many have insinuated that Muslims ought to come out from their cocoon and rise to the challenge of contributing to the future, and desist from merely resting on past laurels. Since the bulk of ideas and innovations in research emanate from the 'ivory towers', it is important that Muslim-based institutions of higher learning take up the challenge. The Federation of Islamic Medical Associations (FIMA) through its Consortium of Islamic Medical Colleges (CIMCO), must take the bold step in working towards a transformation within Muslim Institutions of Higher Learning to be centers of excellence in research and innovations. Such novel and noble efforts must begin with us identifying the recipe for our past glory, introspectively and soul searchingly looking at our present state of affairs and strategizing action plans for the future. This article attempts to cover all those areas and is hoped that it will be a blue print to call for action within CIMCO, FIMA and beyond.

Keywords: *Muslim scientists, past Islamic civilization, Islam, history of medical research.*

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Muslims' contribution to medical research during the glorious era

History has witnessed that Prophet Muhammad (PBUH) united the nomadic Arab tribes and successfully produced a strong and united nation. The two most powerful empires at that time were the Persian and Byzantine empires. The boundaries of the Islamic Empire were the Atlantic Ocean on the West and the borders of China on the East. Only 80 years after the death of Prophet Muhammad (PBUH), the Muslims crossed to Europe and ruled Spain for more than 700 years.

For 1,000 years, the Islamic empire was the most advanced and civilized nation in the whole world [(1)]. The reason for this glorious era was the teachings of Islam, i.e. importance and respect of gaining knowledge, respect for authority, other cultures and religions, discipline and tolerance to other societies including the insatiable desire to gain knowledge from various sources. The origin of this marvellous development and progress was the efforts put by Muslim scholars in translating the entire essential Greek, Syriac (the language of eastern Christian scholars), Pahlavi (the scholarly language of pre-Islamic Iran), and Sanskrit medical works and other writings on various topics into Arabic. The process of translation reached its peak with the establishment of the "House of Wisdom" (**Bayt ul-Hikma**) by the Abbasid Caliph Al-Ma'mun in Baghdad in 830 CE [(2)]. This task was completed by 10th century CE and Damascus, Cairo and Baghdad were the main centres for this work. During that period Baghdad emerged as the center of the scientific knowledge and activity and Arabic became the international language of science and diplomacy.

Muslims not only translated the works of previous civilizations but they developed their own scientific knowledge by conducting enormous research in various fields especially medicine. The European medical system is based not only on Arabian philosophy but still follows the same system introduced by Muslim scholars and physicians, as pointed out in the following paragraphs. The impact of Islamic civilisation on Western science, technology, and medicine between the years 800 and 1450 cannot be ignored[(3)]. Similarly today's Western world might look very different without the legacy of Muslim scholars in Baghdad, Cairo, Cordoba, and elsewhere[(4)] .

Medical Education was taken as a serious matter and a system was developed to train physicians. The medical teaching was based on the apprentice system and the Islamic medical schools were developed on the pattern of university and hospital of **Jundi-Shapur**, a Persian city conquered by Muslims in 636 C.E. The whole medical teaching method can be traced back to the advice of **Ali ibn al-Abbas (Haly Abbas: -994 -C.E.)** to medical students[(1)]

"And of those things which were incumbent on the student of this art

(medicine) are that he should constantly attend the hospitals and sick houses; pay unremitting attention to the conditions and circumstances of their inmates, in company with the most astute professors of medicine, and inquire frequently as to the state of the patients and symptoms apparent in them, bearing in mind what he has read about these variations, and what they indicate of good or evil."[1]

Similarly, **al- Razi (Rhazes: 841-926 C.E.)** asked the medical students to look for the classic symptoms of a disease as described in the text books and then compare them with what they found in their patients[1].

Physicians such as al-**Razi (-Rhazes), Ibn-Sina (Avicenna: 980-1037 C.E.) and Ibn Zuhr (Avenzoar: 116 C.E.)** were involved not only in treating patients but they worked both as hospital directors and deans of medical schools at the same time. The selection of patients with important symptoms and signs for teaching purposes, writing clinical reports on different cases, using them for teaching and maintaining registers of patients` records were part of medical education during that early period.

Training in basic and clinical sciences were carried out separately in prominent centers of learning such as in Jundi-Shapur and Baghdad. Baghdad medical school was more advanced with anatomy being taught by dissecting apes while in other medical schools only lectures and illustrations were used to teach anatomy. The concept of prerequisites for admission in medical school was enforced and Alchemy (chemistry) was one of the prerequisites. Medicinal herbs and pharmacognosy was part of basic training and most of the hospitals used to maintain herbal gardens as a source of drugs for patients and means of instruction for the students.

After completing basic training, students were admitted as apprentices to a hospital for pre-clinical training that included joining a large group supervised by young physicians for indoctrination, preliminary lectures, and familiarization with library procedures and uses. Lectures on pharmacology, toxicology and the use of antidotes were delivered at this stage of medical training.

Clinical training started immediately after completing the pre-clinical training and students were assigned in small groups to famous physicians and experienced instructors. Students joined ward rounds, discussions, lectures, and reviews. Therapeutics and pathology were introduced at this level with strong emphasis given on clinical instruction. Upon showing progress, more subjects were introduced to help students in making diagnosis and in their clinical judgment. Clinical observation and physical examination including general physical examination were important components during this phase and students were asked to examine a patient and make a diagnosis of the illness under supervision of a

senior physician.

Once students learned to perform well in wards, they were assigned to outpatient areas. In outpatient clinics, students examined the patients and reported their findings to the instructors. After discussion, treatment was decided on and prescribed to the patients but patients who were too ill were admitted as inpatients. Students were also responsible for keeping records for every patient.

Selecting and developing a curriculum for medical schools was another important area for effective training. Different schools used to have some difference in the clinical curriculum in their courses; however the main emphasis in all curricula was usually internal medicine and surgery. Specialization in specific areas was also available under famous specialists. Many surgical procedures such as amputation, excision of varicose veins and hemorrhoids were required knowledge.

Orthopedic procedures including the use of plaster and reduction of fracture were widely taught and shown to students (this method of treating fractures was rediscovered in the West in 1852). Ophthalmology and Obstetrics were not taught regularly in medical schools and apprenticeship to an eye doctor was the preferred way of specializing in ophthalmology while obstetrics was for the midwives. Surgical treatment of cataract was very common. Ibn Sina was known to practice and teach psychotherapy.

Following completion of formal training, there was a licensure examination students had to take. Passing this examination was a pre requisite to enter practice. Licensing of physicians was introduced in Baghdad in 931 C.E. when Caliph al-Muqtadir learned that a patient had died as the result of a physician's error. He ordered his chief physician, Sinan-bin Thabit bin Qurrah to examine all those who practiced the art of healing. From that time on, licensing examinations were required and administered in various places. Licensing Boards were set up under a government official called *Muhtasib* or inspector general. Pharmacists were also employed as inspectors to inspect drugs and maintain quality control of drugs sold in a pharmacy. The chief physician gave oral and practical examinations, and if the young physician was successful, the *Muhtasib* administered the Hippocratic Oath and issued a license. According to al-Razi, a physician had to satisfy two conditions for selection. First he had to be fully conversant with the new and the old medical literature and secondly, he must have worked in a hospital as house physician.

The development of efficient hospitals was an outstanding contribution of Islamic medicine. Hospitals served all citizens free of charge regardless of their color, religion, sex, age or social status. The hospitals were run by the government and the directors

of hospitals were physicians. Many modern hospitals have been developed on the same model as hospitals in Islamic era i.e. separate wards for male and female patients, special apparel for in- patients, nursing staff and porters, qualified and licensed physicians to practice medicine, teaching facilities for educating medical students, out-patient and inpatient departments, housing for students and house-staff and pharmacies dispensing drugs to patients. Hospitals kept records of patients and were equipped with conference rooms and libraries containing the most up-to-date books. Holistic approach towards healing was evident by the fact that in Tulun Hospital (founded in Cairo in 873 CE) each patient on discharge received five gold pieces to support himself until he could return to work (an example of holistic approach to patient care, considering not only the medical causes but the social, psychological and spiritual aspects as well).

The libraries were well stocked with reference materials. The library of the Tulun hospital had 100,000 books, Mustansiriyya University in Baghdad contained 80,000 volumes; the library of Cordova had 600,000 volumes; Cairo had 2,000,000 and that of Tripoli 3,000,000 books).

State of the art hospital concept was also evident. The al-Adudi hospital of Baghdad (built in 981 C.E.) was furnished with the best equipment and supplies known at the time. It had interns, residents, and 24 consultants attending its professional activities. The professional activities were not confined to hospitals; an Abbasid minister, Ali bin Isa, requested the court physician, Sinan bin Thabit, to organize regular visiting of prisons by medical officers.

The hospitals were of two types - the fixed and the mobile. The mobile hospitals were transported upon beasts of burden and were erected from time to time as required. Similar moving hospitals accompanied the armies in the field. The field hospitals were well equipped with medications, instruments, tents and a staff of doctors, nurses, and orderlies. The traveling clinics served the profoundly disabled, the disadvantaged and those in remote areas. These hospitals were also used by prisoners, and by the general public, particularly in times of epidemics.

Famous Muslim Physicians and Surgeons

Some of the great scholars of early Islamic era, who contributed not only to medicine but several other disciplines, are as follows:

Al-Razi (Rhazes born 865 C.E.) wrote the first medical description of smallpox and measles. He described the clinical difference between the two diseases so vividly that nothing since has been added. His practical implementation of "infection" knowledge is reflected from the incident when he was asked to choose a site for a new hospital in Baghdad. He hung fresh pieces of meat

in various places and observed the area where the meat was least decomposed. Al-Razi was the first to use animal gut for sutures. He started using silk sutures and alcohol for hemostatis.

Al-Razi introduced mercury compounds as purgatives (after testing them on monkeys); mercurial and lead ointments. His interest in urology focused on problems involving urination, venereal disease, renal abscess, and renal and bladder calculi. He described hay-fever or allergic rhinitis.Some describe al-Razi, as the greatest physician of the Islamic world. He wrote *Kitab Al-Mansuri* (Liber Almartsoris in Latin), a 10 volume treatise on various disciplines, including Greek medicine[5]. His texts continued to be reprinted well into the 19th century.

Ibn Sina (Avicenna) in his masterpiece *al-Qanun fi al- tibb* (The Canon of Medicine) containing over a million words described complete studies of physiology, pathology and hygiene. He specifically discoursed upon breast cancer, poisons, diseases of the skin, rabies, insomnia, childbirth and the use of obstetrical forceps, meningitis, amnesia, stomach ulcers, and tuberculosis as a contagious disease, facial tics, phlebotomy, tumors, kidney diseases and geriatric care. He recognized 'physiological psychology' in treating illnesses involving emotions. From the clinical perspective, Ibn Sina developed a system for associating changes in the pulse rate with inner feelings which has been viewed as anticipating the word association test of Jung. Ibn Sina suggested the communicable nature of tuberculosis. His recommendation of wine as the best dressing for wounds was very popular in medieval practice. He was the first to use alcohol as an antiseptic.

Ibn Sina also originated the idea of the use of oral anesthetics. He recognized opium as the most powerful *mukhadir* (intoxicant drug). Less powerful anesthetics known were mandragora, poppy, hemlock, hyoscyamus, deadly nightshade (belladonna), lettuce seed, and snow or ice cold water.

Ibn Sina's description of the surgical treatment of cancer holds true even today after 1,000 years. He said the excision must be wide and bold; all veins running to the tumor must be included in the amputation. If this is not sufficient, then the area affected should be cauterized.

Ibn Sina was known in the West as "the prince of physicians." His synthesis of Islamic medicine, *al-Qanun fi'l tibb* , was the most authoritative book on medical matters in Europe for several centuries. Although Ibn Sina made advances in pharmacology and in clinical practice, his greatest contribution was probably in the philosophy of medicine. He created a system of medicine that today we would call holistic and in which physical and psychological factors, drugs, and diet were combined in treating patients [6].

Abu al-Qasim Khalaf bin Abbas al-

Zahrawi (Abulcasis born 930 CE) is considered to be the most famous surgeon in Islamic medicine. In his book a*l-Tasrif,* he described hemophilia for the first time in medical history. The book contains the description and illustration of about 200 surgical instruments many of which were devised by al- Zahrawi himself. In it al- Zahrawi stressed the importance of the study of anatomy as a fundamental prerequisite to surgery. Al- Zahrawi is probably the first surgeon in history to use cotton (an Arabic word) in surgical dressings, in the control of hemorrhage, as padding in the splinting of fractures, as a vaginal padding in fractures of the pubis and in dentistry. He introduced the method for the removal of kidney stones by cutting into the urinary bladder. He was the first to teach the lithotomy position for vaginal operations. He described tracheotomy, distinguished between goiter and cancer of the thyroid, and explained his invention of a cauterizing iron which he also used to control bleeding. His initial description of varicose veins stripping, is very similar to what is still done in surgery. In orthopedic surgery he introduced what is today called Kocher's method of reduction of shoulder dislocation and patelectomy, 1,000 years before Brooke reintroduced it in 1937.

Al-Tasrif was translated into Latin and became the leading medical text in European universities during the later middle ages. Al-Zahrawi was also a noted pathologist, describing hydrocephalus and other congenital diseases as well as developing new surgical technologies such as catgut sutures [7,8]. The surgeons of Islam practiced three types of surgery: vascular, general, and orthopedic. Surgeons all over the world today unknowingly practice several surgical procedures that al- Zahrawi introduced 1,000 years ago.

The use of anesthesia was one of the reasons for the rise of surgery in the Islamic world to the level of an honorable specialty, while in Europe surgery was belittled and practiced by barbers and quacks. The Council of Tours in 1163 C.E. declared surgery is to be abandoned by the schools of medicine and by all decent physicians.

The medical texts of ibn Rushd (Averroes) were also widely used in European universities. Ibn al-Nafis, a 13th century Arab physician, described the pulmonary circulation more than 300 years before William Harvey[9].

Ophthalmic surgery was a specialty which was quite distinct both from medicine and surgery. In ophthalmology and optics ibn al-Haytham (Alhazen born 965 C.E.) wrote the *Optical Thesaurus* from which such worthies as Roger Bacon, Leonardo da Vinci and Johannes Kepler drew theories for their own writings. Words such as retina and cataract are of Arabic origin. In his *Thesaurus* he showed that light falls on the retina in the same manner as it falls on a surface in a darkened room through

a small aperture, thus conclusively proving that vision happens when light rays pass from objects towards the eye and not from the eye towards the objects as thought by the Greeks. He presented experiments for testing the angles of incidence and reflection, and a theoretical proposal for magnifying lens (made in Italy three centuries later). He also taught that the image made on the retina was conveyed along the optic nerve to the brain. Al- Razi was the first to recognize the reaction of the pupil to light and Ibn Sina was the first to describe the exact number of extrinsic muscles of the eyeball, namely six. The greatest contribution of Islamic medicine in practical ophthalmology was in the matter of cataract. The most significant development in the extraction of cataract was developed by Ammar bin Ali of Mosul, who introduced a hollow metallic needle through the sclera and extracted the lens by suction. In Europe, this technique was rediscovered in the nineteenth century.

Pharmacology took roots in Islam during the 9th century. Yuhanna bin Masawayh (777-857 C.E.) started scientific and systematic applications of therapeutics at the Abbasids capital. His student Hunayn bin Ishaq al-lbadi (809-874 C.E.) established solid foundations of Arabic medicine and therapeutics in the ninth century. In his book a*l-Masail***,** Hunayn outlined methods for confirming the pharmacological effectiveness of drugs by experimenting with them on humans. He also explained the importance of prognosis and diagnosis of diseases for better and more effective treatment.

Methods of extracting and preparing medicines were brought to a high art, and their techniques of distillation, crystallization, solution, sublimation, reduction and calcinations became the essential processes of pharmacy and chemistry. With the help of these techniques, the Sayadelah (pharmacists) introduced new drugs such as camphor, senna, sandalwood, rhubarb, musk, myrrh, cassia, tamarind, nutmeg, alum, aloes, cloves, coconut, nuxvomica, cubebs, aconite, ambergris and mercury. The important role of the Muslims in developing modern pharmacy and chemistry is memorialized in the significant number of current pharmaceutical and chemical terms derived from Arabic: drug, alkali, alcohol, aldehydes, alembic, and elixir among others, not to mention syrups and juleps. They invented flavorings extracts made of rose water, orange blossom water, orange and lemon peel, tragacanth and other attractive ingredients. There are numerous contributions to pharmacology and therapeutics made by al-Razi, al- Zahrawi, al- Biruni, ibn Butlan, and al-Tamimi..In the realm of psychosomatic disorders both al-Razi and ibn Sina achieved dramatic results, antedating Freud and Jung by a thousand years. When al-Razi was appointed physician-in-chief to the Baghdad Hospital, he made it the first hospital to have a ward exclusively

devoted to the mentally ill.

Najib ul- Din Muhammad, a contemporary of al- Razi, left many excellent descriptions of various mental diseases. His carefully compiled observation on actual patients made up the most complete classification of mental diseases theretofore known. Najib described agitated depression, obsessional types of neurosis, Nafkhae Malikholia (combined priapism and sexual impotence), Kutrib (a form of persecutory psychosis) and Dual-Kulb (a form of mania).

An asylum for the mentally ill was built early in the 8th century at Fez, Morocco. This was followed by others; in Baghdad (705 C.E.), in Cairo (800CE), in Damascus and Aleppo (1270C.E.). In addition to baths, drugs, kind and benevolent treatment given to the mentally ill, music-therapy and occupational therapy were also employed. These therapies were highly developed at that time.

Unfortunately the great Islamic civilization constructed by the Muslims in that era went into decline after 1000 years of glory and progress[10]. The flow of technology, research and development from the Islamic world to the West gradually slowed down and ultimately completely reversed in the past 500 years[11].

Over the last decades, Western educators have been trying to improvise the medical education system by emulating the Muslim system of the past but at the same time avoiding mentioning that Islamic and Arab systems pre dated their efforts. A case in point is the introduction of an integrated and spiral curriculum instead of dividing curriculum into basic and clinical sciences based on disciplines.

The best way to inculcate Islamic input in our medical education system is to rediscover and revive the methodology adopted by the great Muslim scholars cited above.

The rise and decline of Muslims' contribution: why and how?

The enormous contributions of the Muslims to science in general and medicine in particular are hardly surprising. Islam has always extolled its followers to explore the frontiers of knowledge beginning with the very first words revealed by Jibrail to Prophet Muhammad (PBUH) " Read" [12]. This is followed by many other verses which challenge the human mind to look and study Allah's creation[13-16]. In at least two such verses, Allah challenged the believers to look around themselves and then at themselves, a clear challenge for humans to understand themselves better [17, 18]. The Qur'an also reminded the believers that whatever they know at the time of revelation was but a drop from an ocean of knowledge that is with the Creator[19]. It was such verses from the Qur'an which spurred the thought processes of those generations and which led to inquisitive minds exploring the frontiers of knowledge culminating in boundless discoveries

and inventions. Very unlike the European Renaissance researchers who pursued knowledge with vigor to prove that God (aka the Church) was wrong, the Muslim scientists and researchers drew closer to the Creator the more they discovered. Indeed Allah made it clear in the Qur'an that those believers with knowledge are not the same as those without it[20]. Establishing harmony between the human reasoning and the verses of the Glorious Qur'an was one of the mostimportant catalysts for the insatiable thirst for knowledge at that time. Muslim scholars studied various types of sciences from various sources to identify the relation between the universe and humans on one hand and the Creator on the other. Texts of ancient Greek, Persians and Indians were translated by Muslim scholars and from this healthy cross fertilization they developed their own philosophy and extended the frontiers of knowledge. The Muslims' earlier contributions thus helped create the foundation for the philosophical basis of the European Renaissance which was to follow[21]. The Europeans took inspiration from the Islamic philosophy which constantly encouraged scientific inquisitiveness and eventually paved the way for a large number of discoveries made by the Muslims. The Europeans took inspiration from the Islamic Renaissance a few centuries earlier. This made it possible for the Europeans to present new, radical ideas without consulting religious fundamentalists and potential opponents, the Roman Catholic Church, at that time. However despite its remarkable emergence and contributions, several factors and events culminated in the fall of Islamic civilization and contributions of the Muslims to the development of science and technology[22].

Lack of promotion of science in an unstable political state

State policies to promote communications, trade and economic prosperity pursued during the early centuries of Islam, helped in promoting the demand for science and technology. The Islamic caliphate of the Umayyad from the 7th Century C.E. showed an interest in science. It translated the scientific tradition of late antiquity but went further by elaborating and expanding on it. The consequence was while Europe was still in the Dark Ages, Muslim scholars were already at the age of philosophical and scientific development. Khalid bin Yazid (one of the early Umayyad princes at the end of the 7th century) encouraged Muslim scholars to study medicine and chemistry by donating his treasure for the cause. He also encouraged translation of several Greek and Coptic medical books into Arabic.

The Abbasid Caliphs (8th century) followed the traditions and encouraged the translation of Persian medical knowledge into Arabic. New ideas were also brought from India and China not only in medicine but also in mathematics, chemistry and

philosophy. Khalifah al-Ma'mun (813-833 CE) and al-Mutawakkil (847-861 C.E.) were supportive to science, research and development. Al-Mutawakkil reopened the *Dar al-Hikmah* and further encouraged translation of books into Arabic. As a result, during the Umayyad and Abbasid periods, their capitals Damascus and Baghdad attracted scholars and scientists from the then developed world. When the centers of power moved to Cairo, Spain, Persia and Istanbul, the flow of scholars followed suit.

Unfortunately with the political decline of the Islamic state, due to factors within and without, the lack of relevant political patronage resulted in a parallel decline in developments in knowledge and with it science and technology. Indeed ibn Khaldun, in his book *al-Muqaddima* [23] described the factors essential for the development of science and the decline which will ensue if these factors are lacking. According to him knowledge is perfected and becomes ubiquitous when the demand for it increases because people try to learn new knowledge but if there is no demand for new knowledge then it becomes neglected and will eventually disappear[24].

States, especially if politically stable, are the greatest marketplaces for knowledge base because of the huge demands they (the states) create. Consequently, if states were to decline, knowledge and knowledge based professions will decline too. Ibn Khaldun also described that if a region becomes weak, loses its influence and its population decreases, the professions also decrease and disappear [25] . As for sciences, he described that sciences increase with the increase in prosperity and the greatness of civilization in a region[26]. Baghdad, Cordoba, al-Qayrawan, al-Basra, and al-Kufa were cities which were populous and prosperous in the early centuries of Islam. This led to civilization and sciences to establish themselves in these areas. But when these cities became less prosperous and their population also decreased, science and learning disappeared from these cities and moved to other regions of Islam. The lack of political stability created a situation where further progress became almost impossible. For any further breakthroughs in science, a revolution was necessary to overthrow the old dominant systems. This type of revolution needs a well established community of scientists working in a stable and flourishing economy and supportive atmosphere for a long time.

This community was present in Europe after the 15th century and continued to develop with the increase of European wealth and population. Islamic world was lacking this type of community and hence there was no development in scientific knowledge. Some authors suggested the negative attitude of Muslim theologians as an important reason for the decline of science in Islamic regions especially in 19th century[27, 28].

The rise of the Madrasah system and the compartmentalisation of knowledge.

Some writers suggest that the 'Madrasah'(school) system was one of the contributing factors for the decline of sciences in Islam. The *Madrasah* system flourished after the first Madrasah called Madrasah Nizamiyyah was established in Baghdad by Nizam al-Mulk in 459 Hijri (1067 C.E .) that favored the study of theology and law[29]. This system unfortunately divided the institutions for the study of sciences and theology. Medical sciences and other sciences were studied in various places like medical schools or hospitals, observatories, libraries, academies and under individual renowned scientists supported by the rulers. *Madaris* (sing. *Madrasah*) meanwhile were developed by powerful and wealthy individuals who contributed their wealth to support them. The purpose of establishing these *Madaris* was always religious and they were the forerunners of the college system in Western Universities[30]. However while Western universities combined colleges for theology, law, arts, science and medicine, Madaris only concentrated on theology and law. Madrasas run by independent individuals continued to exist without any interruption whereas other centers of study for sciences which were dependent on prosperity of the state deteriorated and disappeared with the decline of Islamic states. *Madaris* run by individuals ended up propagating a particular individual's paradigms of education and Islam. This contributed to "secularisation of knowledge" and "Tunnel Vision Syndrome" of present day Muslim societies.

Geographical factors and natural disasters.

Most of the then Islamic regions consisted of arid or semi-arid lands with only a small proportion of scattered heavily inhabited areas. These inhabited areas were also dependent on irrigation and because of lack of enough rainfall in these areas, it was not sufficient for agriculture. The only productive agricultural areas were located along the great rivers of Nile, the Euphrates and the Tigris but individuals were unable to take advantage of this water and central governments were responsible for developing the irrigation system. With the decline of central governments, irrigation works were neglected and agriculture was affected severely. Small agricultural lands became arid and economy and civilization of the whole region were destroyed. Natural disasters are another important factor contributing to the depopulation of Islamic regions especially Egypt, Syria and Iraq in the middle ages [31]. A famine caused by low levels of Nile in 968 C.E. resulted in death of about 600,000 people. Between 1201-1202 C.E. a famine was followed by plague in Egypt and caused death of large number of people. The plague between 1347-1349 C.E., known as Black Death,

swept across the Islamic world and Europe and thousands of people died daily. The population of Egypt, Syria and Iraq was reduced to one third. Several epidemics of plague recurred in Egypt and Syria in 1363 and 1515 C.E. These recurring natural disasters and disease epidemics affected agriculture and animal husbandry leading to collapse of these industries due to death of skilled workers. These factors accelerated the process of economic decay. This, coupled with the decline in political stability, led to a lack conducive environment for knowledge and science to thrive because society's priority had to be refocused.

Attacks from external enemies

The Muslim world, at its height was attacked by two sets of invaders, one from the West and the other from the East. From the West came the European Crusaders. Seven Crusades were waged against Syria, Palestine, Egypt and Tunisia between 1096 – 1291 C.E. These Crusades helped Western Europe to grow united on all fronts and helped increase trade and capital among themselves[32]. New maritime colonies were developed under Crusaders` rule and they survived the Muslim re-conquest[33]. Syria and Egypt struggled together under the Ayyubids and the Mamlukes and adopted a military system that defeated and expelled the Crusaders. The efforts to stop the Crusaders weakened the Muslim world and their economy for two centuries. After the unsuccessful Crusades, The Western forces also attacked the cradle of knowledge in Andalusia, carving out bit by bit the Muslim land until the last bastion in Granada fell in 1492 C.E.

While the Western front was busy repelling the Crusaders, a bigger and more formidable threat emerged, this time it came from the East. By the middle of the 13th century, Genghis Khan united the nomadic tribes of Mongolia and attacked the Eastern Islamic lands. Samarkand, Bukhara and Khwarizm were conquered and destroyed by them. In 1221 CE they entered Persia. Another invader from East, Hulagu together with his army of 200,000 men marched with a plan to conquer all Islamic lands as far as Egypt. He managed to conquer Baghdad in 1258 CE and killed the Abbasid caliph al-Musta`sim and abolished the caliphate. The river Euphrates was reported to be a mosaic of red and black from the blood of Muslims killed and from the ink of countless books thrown into the river. This was the beginning of the end of the great Islamic civilization on the Eastern front, more than two centuries before the fall of Granada.

These invasions and assault on the Muslim land led to massive massacres and significant loss in terms of human and other valuable resources. The Mongols slaughtered up to 2 million people in Baghdad alone[34]. This contributed greatly to the process of depopulation and decline of civilization. The Muslims however

managed to regain some lost grounds. The Egyptian Mamlukes for example managed to defeat the Mongols in 1259 C.E. and during the same period the Crusaders and the Mongols were completely expelled from Syria. This was however not enough to recover all the lost treasurers of the Islamic civilisation in all its former shape and glory. Although the Mongol invaders embraced Islam, their subsequent actions only contributed further to the decline of the glorious era of Islamic sciences. For example, one of them by the name of Timur (Tamerlane), who ruled from 1370-1405 CE, devastated Islamic world in the name of Islam. He invaded Iraq and Syria between 1400-1401 CE destroying two important seats of knowledge and civilisation, Baghdad and Damascus. He took several learned men and artisans from Damascus to his capital in Central Asia and caused further decline of Islamic civilization in those areas.

The rise of Europe as a world power.

The strategic location of the Islamic world between East and West, its leadership role in science and technology, coupled with its military strength, were reasons for its prosperity. In terms of economic clout, the Muslim world controlled international trade until the end of 15th century. The Muslim monopoly of the land route for trade, commerce and all that came with it led the enemies, especially Europe to seek an alternative route. In the same year Granada fell to the Christian invaders, the victorious King Ferdinand and Queen Isabella dispatched Christopher Columbus to find a route to India to bypass the Islamic lands which at that time was under the Ottomans. Although Columbus never discovered the route, it accidentally led to the discovery of the so called New World. A flurry of activities was initiated following this adventure with the European racing each other for world maritime domination. The Portuguese also tried to bypass the Islamic lands to reach to the East and they discovered the route around Africa. Because of lack of Islamic naval posts along these routes, the Portuguese occupied almost all the strategic trading posts in the East. The Europeans came with three clear missions; Gold, Glory and Gospel. They established direct trade with Europe. In most places the Europeans unexpectedly encountered thriving Muslim civilisation; in parts of Africa, the Indian Subcontinent, and all of South East Asia. The Crusaders mentality resurfaced leading to inevitable clashes. With their superior military technology many of these clashes favored the more well equipped and ruthless Europeans. Thus began the rise of European power and era of subsequent subjugation of Muslim land in the East. Spain and Portugal paved the way and by the end of the 16th century C.E, Holland, England and France developed as the dominant forces in international trade and were the major colonisers. Although Europeans were competing with one

another in their quest, they generally complemented each other's role in bringing wealth and stability to their motherland; Europe. The center of international trade quickly shifted from the Muslim dominated Mediterranean to the European dominated Atlantic and colonial outposts of Asia .The new found wealth brought economic prosperity and political stability to Europe. With it came further scientific progress.

Ironically some of the Muslims policies contributed to the rise of Europe. For example in Ottoman caliphate, foreign non-Muslim trading communities were given privileges and immunities known as Capitulations. The Ottomans thought these policies would help in improving the economy of the caliphate but these concessions allowed the Europeans to gain control of the economic life of the Islamic regions[35]. Gradually with the fall of Islamic states, more foreign countries demanded these privileges and these concessions were extended to non-commercial entities. By the 19th century European imperialism increased under Britain and because of several unfavorable commercial treaties, the revenue of Ottoman government dropped drastically[36]. The Muslim world was also deprived of the scientific revolution engulfing Europe from the 18th Century onwards. The cultural barrier between Christian Europe and Muslim world isolated the latter from the revolutions taking place in the science and technology in Europe. This was one of the important factors contributing to the decline of the Islamic dominant position. While Europe continued to develop and flourish with science and technology, the Muslims began to fragment under the weight of colonisation. Rapid deterioration within the Muslim world ensued. With practically no progress in any field of science, the sense of isolation from scientific progress deepened within the Muslim world. The gap between the Muslim world and Europe in terms of scientific achievement continued to increase[11].

Disunity among Muslims

Most of the factors outlined above could have been prevented had the Muslims been more united and showed a sense of togetherness during times of trials and tribulations. Despite the efforts of their forefathers in spreading the Tawhidic message from Morocco in the West to the Philippines and Indonesia in the East, the Muslims failed to maintain and consolidate unity among the Ummah. The Muslim world became fragmented into small sultanates each wary of each other, oblivious of threats from outside. In the West, the Christians saw this window of opportunity and created more dissension among the Muslims. One by one the desperate sultanates were defeated until Granada was non defensible by 1492 C.E. Upon retreating from Granada the mother of the last sultan Boabdil saw her son weeping while leaving the Alhambra the Ghurnata (Granada) Palace behind.

She famously told the son 'weep like a woman what you cannot defend like a man'. In the East, disunity was also evident, making them too weak to collectively defend against the Mongol onslaught. In the Malay Peninsula, the Portuguese were successful in defeating the Malacca sultanate with help from dissenting sultanates neighbouring Malacca. When wealth was in abundance, Muslims were busy with the luxuries of life at the expense of pursuit of knowledge and spreading truth. This was reminiscent of the warning the second Caliph Umar bin al- Khattab gave when he said he was worried about luxury permeating the Ummah. Healthy discourses on advancement knowledge gave way to polemics and arguments on the branches of Islamic knowledge which were not fundamental to the Ummah's progression. The ultimate insult was when Muslim blood was spilled by fellow Muslims under the guise of liberation, independence and in the name of Allah. While the Europeans could draw the line when to fight among themselves and when to cooperate for their greater good, the Muslims were struggling to find common ground on most things. All in all, the Muslims themselves partially contributed to their decline and with it their demise in the field of scientific advancement

Status of contemporary Muslim contribution in Medical Research

While it is inevitable that Muslims have the sense of pride with the contributions of their forefathers, they have to face the bitter truth; they currently lag behind the rest of the world with regards scientific advancement. The colonization of the Muslim world, which preceded the fragmentation and eventual demise of the Ottoman Caliphate, was the culmination of centuries of decline. During the era of colonization, Muslims were made to look and feel inferior viz a viz the superiority of the Western colonizers. It was beneficial to the interest of the colonizers to sustain this inferiority complex within the psyche of their colonial subjects. Whatever potential which emerged from the Muslim colony were quickly capitalized, and brought into the Western fold. A case in point is an aspiring Indian Muslim surgeon Shaykh Din Muhammad who migrated to Ireland, married an Irish lady and converted to Christianity changing his name to Sake Dean Mahomed[37]. Although he did not produce any contributions to medicine, his grandson, Frederick Akbar Mahomed made major contributions. As a young doctor at the end of the 19th Century, he invented an instrument which was 100 years ahead of his time. The instrument, called a sphygmogram, can accurately trace the radial pulse waveform and based on the obtained waveform one can diagnose disease of the arterial system. His work has recently been revived with great interest to the modern medical scientific community[38].

In the latter half of the 20th century

Muslim countries were granted independence by their colonial masters. More recently, Muslim contribution is better acknowledged even by mainstream Western media. However, the contributions of the Muslims are portrayed as invention of an 'ancient world' with only peripheral significance to modern science. After gaining independence, many Muslim scientists had to travel to the West to pursue undergraduate and later post graduate studies due mainly to the lack of adequate infrastructure in their newly independent homeland. Many successful researchers and high achieving professionals among the Muslims decided to stay in Western countries for the same reasons; their own countries may not be able to support their career pathway for more scientific achievements. In the field of cardiology for example, Muslim researchers with major and significant contributions are mainly from South Asia. Names such as Salim Yusof, Hamid Ikram and Shahabuddin Rahimtoola are contemporary giants who are world famous. All had to ply their trade and expertise in the West, primarily in North America. In 2009, Shahabudin Rahimtoola (a graduate of Karachi University) was awarded the European Society of Cardiology Gold Medal Award for his lifelong contributions in the field. Prominent Muslim physician scientists have also held very important and prestigious positions, arguably the most notable being the immediate past director of the National Institute of Health (NIH) in the United States of America, Dr.Elias A. Zerhouni, a world renowned radiologist and former vice dean of Johns Hopkins School of Medicine.

Excellent individual Muslims residing in the West aside, how have Muslim nations fared in their contemporary contributions to medical research? A search of credible databases such as the Medline showed a stark reality which we all would like to improve on. For example in 2005 there were altogether 35,431 cited publications from 6 Muslim countries (Indonesia, Pakistan, , Egypt, Iran, Saudi Arabia, and Malaysia). This total is only slightly more than that of a small European nation, Netherlands (35,027) and less than 10% that of the United Kingdom (372,243) while the United States is even far ahead (1, 529,164). A sizeable contribution made by the United States emanates from work done by Muslim scientists working there. However on a positive note there has been close to a tripling of published research output from these Muslim nations by 2009 (94,034). While this is encouraging, we as a nation still lag behind the non Muslim nations. For example over the same period, the Netherlands has increased their output by 6 fold (to 220,123). Israel meanwhile published more than all the six Muslim countries put together (111,842). This represents a 9 fold increase from their output in 2005 (18,217). Since most of the published work originate from institutions of higher learning, this

state of affairs may be reflective of the state of such institutions in the Muslim world. Indeed the latest Times Higher Education Survey showed that none of the universities in the Muslim world ranked in the top 100, the highest being the University of Malaya in Malaysia at a lowly 180[39]. In fact the University of Malaya is the only university from a Muslim country which is listed in the top 200. This in turn is a reflection of priorities given to research funding in most Muslim countries.

Not only are Muslims despondent at the relative lack of Muslim contributions to research and knowledge generation, even the non Muslims are asking the question[40]. Some have even proposed ways for the Muslims to reform themselves[41]. Others are perplexed as to why despite such a strong heritage in science, why are Muslims lagging behind[42]. As a nation we have to answer the questions being asked of our conviction and rise up to the challenge of reliving our glorious distinguished past. We should not just lay on our laurels and sing the same old mantra about how great we were in the past. We have to face the stark reality that we are way behind in contemporary setting. We should also stop blaming everything on Western conspiracy theories. Adopting an attitude of 'Western phobia' and 'Western bashing' does not help either. We must strategise to bring back the glorious past.

Strategies to increase Muslims' contributions to medical research

What is required in the Muslim world is no less than a major transformation in order for us to return to our glorious past. It is important to begin with the end in mind and think long term. An exercise in "Reverse Engineering" is therefore pertinent. Clear end points or outcomes must be identified and this outcome extrapolated in the reverse direction to present day situation. This will provide an opportunity to recognize immediate requirements in the present system to reach the identified end point. Major barriers and hurdles must also be anticipated and strategies to circumvent them thought of. Any major transformation must be done in an integrated and collective approach. Muslim nations should work together towards this noble goal. This obviously is a tall order based on our track record in tackling common issues in the recent past. However the Muslim scientist community should not be disheartened and take this as a collective challenge.

Listed in Table 1 are the desired end points which we should strive towards. Once this is agreed upon, a stepwise approach must be adopted and the end point projected into present day situation. This will allow for adequate opportunity to visualize and reflect upon present and future prospects and alignment of available resources with projected end points[43]. The overall aim of targeting these end points is to create respectable Muslim Medical Institutions which are capable of generating respectable

research output. There are essentially two main components to this exercise: inculcation of research culture and inculcation of Islamic values (which as discussed above encourages and promotes research) among Muslim medical institutions. These two components are addressed in tandem throughout the body of this paper.

Working backwards; efforts towards achieving the desired endpoints will require the following pre requisite as listed in tables 2 – 7

Table 1: Desired End Points: Respectable Research Output from Muslim Medical Institutions

- Publications in medical research journals of international repute.
- Publications of medical books from Muslim authors
- Establishment of centers of excellence in medical research in Muslim countries
- Formation of international research collaboration between Muslim medical institutions and other international medical institutions of repute
- Formation of industrial research collaboration between Muslim medical institutions and various health related industries
- Medical research fairs and conferences with involvement of international medical community

Table 2: Establishment of "Muslim" Medical Institutions

- Paradigm shift from "medical school" to "Muslim medical school" and from "Linear Instruction" models of teaching to constructivist curricula that nurture curiosity
- Visible inculcation of Islamic input in all areas of medical instruction
- SPIRAL integration of research and Islamic values with medical curricula. Students to learn research as a standard subject, not an option or an area of interest
- Include Islamic injunctions in "Criteria for Recognition" for medical institutions

Table 3: Enhancing Research and Islamic Input into Existing Medical Institutions in Muslim Countries

- Basic Islamic knowledge pre-requisite for entrance to medical institutions
- Islamic studies examinations included in the" promotional examinations" each year
- Optional courses in Islamic Medicine and Islamic civilization with

incentives

- Complete SPIRAL integration of medical curriculum with Islamic values and research

Table 4: ***Identifying Islamic Input as an Urgent Requirement for Muslim Medical Institutions***

- Sharing of results of "Needs Assessment Exercise" by the International Faculty of Islamic Medical Education and Research with medical institutions, Muslim leaders and financial support groups
- Resolution of "Striving for Excellence in Islamic Medical Education and Research" to be passed with specific time bound roles and goals description

Table 5: ***In-Depth Analysis of Existing Curricula, Status of Medical Research and Modus-Operandi for Medical Education in Islamic Medical Institutions***

- International Faculty of Islamic Medical Education and Research to perform a pre-planned, standardized analysis of respective medical curricula according to pre-specified schedule and compile results

Table 6 : ***Establishment of a Motivated International Faculty of Islamic Medical Education and Research with Specific Terms of Reference and Time-Lined Planning, under supervision of CIMCO or the "Key Organization" undertaking this exercise***

- A set of pre-requisites to be provided to medical institutions for nomination of faculty members to the International Faculty
- Individual medical institutions to nominate their representatives to the International Faculty

Table 7: ***Identification of Muslim Medical Institutions/ Associations/ Non Governmental Organisations Motivated to Participate in Rejuvenation (Tajdid) Process***

- Clear time line specified
- Utilising enhanced method of communication in the identification process.

Applying the method of 'Reverse Engineering', we will now take all the steps in their logical order, present to future, and analyze each step taking into consideration the availability of resources and expertise required for each step.

STEP – 1: ***Identification of Muslim Medical Institutions/ Associations/ Non Governmental Organisations Motivated to Participate in the Rejuvenation Process***

The first step will require compiling a resource list of Muslim medical institutions and associations complete with individual contact details. There are several such "directories" available online. One such example is listed in table 8. An organisation like FIMA must take the lead to gather the requisite information. The organization conducting the exercise will then communicate with all the identified muslim institutions/ associations/ Non Governmental Organisations (NGOs) and invite them to participate in the exercise.

A finite time line is proposed for communication exchanges with the relevant bodies. All available lines and modes of communication must be explored and utilised. In this age of information and communication technology explosion, miscommunication must be kept to the barest minimum if not totally eradicated. The short term outcome will lead to compilation of a list of participants, by the key organizations, willing to undertake the challenge. The list will have to be dynamic, allowing for expansion and even withdrawal of membership. This is to ensure that the very first step is done meticulously and successfully. Muslims unfortunately have been stigmatised by some quarters, sometimes justifiably, as a group who make more noise than they can perform.

Table 8: List of Useful Websites for Networking

- Islamic Medical Association of South Africa
- Islamic Organization for Medical Sciences (IOMS).
- The International Association of Muslim Psychologists
- USC Muslim Students Association Islamic Server
- Institute for the Restoration of Science
- Medical Links at IslamiCity
- Muslim Doctors and Dentists Association (MDDA), in UK.
- UMMAA Free Clinic (University Muslim Medical Association)
- Islamic Medicine Institute
- International Society for History of Islamic Medicine (ISHIM)
- ISLAMIC Global Health Network (IGHNet)
- Ibn Sina Academy of Medieval Medicine and Sciences
- International Society for Ramadan Fasting Research.
- World Islamic Association for Mental Health.

STEP – 2: Establishment of a Motivated International Faculty of Islamic Medical Education and Research.

Once Step – 1 is successfully executed, the key organizations conducting this exercise will then develop a set of selection criteria for an International

Faculty of Islamic Medical Education and Research. Specific terms of reference and requisite academic background and experience will be prescribed and finalized into, *"Consensus Document on Selection Criteria for Members of International Faculty of Islamic Medical Education and Research"*.

This document will be shared with all the resource institutions and associations identified in Step-1, Resource institutions will be asked to nominate one or two faculty members for final selection. A final selection interview shall be conducted by the key organization and International Faculty of Islamic Medical Education and Research will be finalized.

Once the key organizations have finalized their decision, a Faculty Development Program will be conducted. Faculty development programs vary widely from institution to institution, and encompass both formal and informal offerings. Offerings in a comprehensive faculty development program should include the following focus areas: (1) professional, including individual scholarship; (2) instructional; (3) leadership; and (4) organizational, eg, time management[44,45] These focus areas may be addressed through workshops, seminars, teleconferences, electronic media, mini-courses, mentoring programs, sabbaticals, and directed publications. External resources can also be effectively utilized for this purpose. The aim of this part of the exercise should be to develop a consensus among the International Faculty about an in depth screening of existing medical curricula with special emphasis on Islamic Education and Research. Required reading and assignments should be in place for these faculty members to facilitate their work. Examples of such literature are limitless. Al Hassani's Thousand Years of Missing History and work of Van Alphin on Oriental Medicine[46,47] are two such examples.

The ultimate aims from Step – 2 are first, the accumulation of this International Faculty and second, the development of a standard screening process for medical curricula of participating institutions re. Islamic Education and Research. This faculty will be authorized by the key organization to provide practical input and plans of implementation for revised curricula..

It is proposed that this step should not take more than 6 months to complete.

STEP – 3: In-Depth Analysis of Existing Curricula, Status of Medical Research and Modus-Operandi for Medical Education in Islamic Medical Institutions.

Once steps 1 and 2 are achieved, the stage is ready for Step – 3. Participating institutions in Step 2 should identify resource persons who have expertise and are passionate about curriculum review and development. Medical training; both at the undergraduate and postgraduate levels is

undergoing an era of transformation with emphasis on outcome based education preparing doctors and specialists for the new millennium. The transformation process is typically done after a comprehensive review of existing curriculum and identifying the needs of the future practitioners. In many countries, the review is 'bottom up' i.e initiated by individual medical schools. In others it is prescribed or instructed by national regulatory authorities like the General Medical Council of the United Kingdom[48] . For postgraduate training requiring high level of skills, expert societies in conjunction with national ministry of health are typically involved[49,50].

In aspiring to relive our glorious era in Medicine, a relook at how we are currently training doctors in the Muslim world is imperative. Many a time we tend to adopt the so called 'best practice approach' by Western based medical educationist. We sometimes fail to dig deep into our strong heritage and ask the critical question 'what kind of training did the likes of ibn Sina, al- Zahrawi and al- Razi went through to become the towering figures they were? ' A critical appraisal of the current curriculum from the Islamic perspective and with the aim of training the future ibn Sina, al- Zahrawi and al- Razi is needed. It is inevitable that a strong emphasis on training the inquisitive, critical and exploratory mind should appear prominent in the curriculum.

The goal of Step – 3, then, is for our International Faculty of Islamic Medical Education and Research to share their curriculum analysis and recommendations with participating institutions in depth. They will make changes to their recommendations in consort with participating institutions to develop practical curricula for implementation. The curricula will address medical education as well as education in Islamic values and research at the same time.

This step will be critical to the success of the subsequent steps. It will be the rate limiting step in the overall scheme of things It will require more time and effort but there is also an urgency to complete this step as soon as is feasibly possible. Although daunting, it is proposed that this step should not take more than 18 months to be completed.

STEP – 4: Sharing of results of "Needs Assessment Exercise" by the International Faculty of Islamic Medical Education and Research with Medical Institutions, Muslim Leaders and Financial Support Groups.

Once step 3 is accomplished, the International Faculty of Islamic Medical

Education and Research will share their findings and recommendations with all the participating institutions and associations in a conference format. The aim of this part of exercise is clearly stated above. At the end of this activity, all the participating institutions and associations will leave with a clear documented vision of Roles and Goals, evaluation strategies and academic success measurement tools for the new curricula. Thereby, the key organization will assume a supervisory role, instead of the assistance role, in the process of striving for excellence in Islamic Medical Education and Research. The conference should aim to pass a resolution on "Striving for Excellence in Islamic Education and Research" to be adopted by participating institutions.

It is proposed that the conference be organised within 3 months of the Faculty submitting its report.

STEP – 5: Implementing Research and Islamic Input into Existing Medical Institutions in Muslim Countries.

Upon adopting the resolution, participating institutions should aim to implement the recommendations within 2 years in the entering class (i.e, year 1 students) in participating institutions. All the participants will be provided with evaluation strategies and measurement tools for the success of new curricula. There are tools available to academicians and managers today, that assist in correct evaluation of success or failure in various domains of organizational set ups. Focal concept in healthcare as well as academic management is "Organizational Capacity"[51]. Organisational capacity refers to the organisation's ability to take effective action, in this context for the purpose of continually renewing and improving its healthcare practices through academic and technological innovation. Absorptive and receptive capacities are theorized as important antecedents to innovation in healthcare[52] as well as academic excellence. Broadly, the concept of absorptive capacity is the organization's ability to recognise the value of new external knowledge and to assimilate it, while receptive capacity is the ability to facilitate the transfer and use of new knowledge [53]. Empirical studies have identified some general antecedent conditions[54,55], and have tested application of the concept of absorptive capacity to healthcare[55], although receptive capacities are less well studied. Application of these concepts to purely academic endeavours is even less well studied but proposed on several occasions. Empirically supported features of organisational context that impact on absorptive and receptive capacities in healthcare include processes for identifying, interpreting, and sharing new knowledge; a learning organisation culture; network structures; strong leadership, vision, and management; and supportive technologies[55,56] .

Organizational Capacity for our purpose can be divided into 4 well researched and valid categories, borrowed from management sciences.

1. Research Activity
2. Research Utilization
3. Knowledge Management
4. Organizational Learning

A new concept here is that of "Knowledge Management" (KM). Definitions of KM vary, but many include the core processes of creation or development of knowledge, its movement, transfer, or flow through the organisation, and its application or use for performance improvement or innovation[57].

Early models of KM focused on the measurement of available knowledge assets and intellectual capital, with later models focusing on processes of managing knowledge in organisations, split into models where technical-rationality and information technology solutions were central and academic models focusing on human factors and transactional processes[57]. The more emergent view is of the organisation, academic or otherwise, as 'milieu' or community of practice, where the focus on explanatory variables shifts away from technology towards the level of interactions between individuals, and the potential for collective learning. However, technical models and solutions are also still quite dominant in healthcare and academics[58,59] .

STEP – 6 and 7: Establishment of Muslim Medical Colleges with Respectable Research Output.

It is the writers' sincere belief that, provided all the preliminary steps (1-5) are followed, realization of goals outlined in Tables 1 and 2 will be achieved in due course, insha'Allah. One key critical success factor towards achieving these goals is for the institution involved to be proactive and methodical in identifying the goals and implementing steps to achieve it. This article is concluded with a brief outline of factors that, if found in participating institutions, will either prove detrimental or beneficial in achieving the intended goals of the whole exercise. These factors need to be recognized, pursued, removed or implemented either prior to initiating this exercise or in the course of doing it. These factors include, but not limited to:

- **Lack of organizational motivation to carry out the exercise:** Although heads of institutions may be highly motivated, the level of involvement of their faculties is the key to their long term commitment to success. It should be presented as a basic requirement to qualify for participation. Coherence of institutional heads with their faculties is very easy to assess in open exchange of dialogue.
- **Strength of Department of Medical Education and Research:** Since this is actually a capacity building exercise, the actual qualifications and personnel of these key areas at ground level may not be satisfactory. However, the key organization needs to assure high level of understanding, professionalism, sincerity, transparency and above all

acceptance among faculties that these two departments have in their institutions.

- **Appointment of Nominees to International Faculty:** Importance of this point cannot be overstated. The key organization must be well acquainted and satisfied with the credentials and personalities of nominees. Appointment of nominees with any intention other than aiming for the "Best for the Best Job" is an in-built mechanism for failure.
- **Pyramidal System of Operation:** All the participants will agree to maintaining logs and abiding by the timeline. Failure to do so should result in suspension of that nominee from the International Faculty. Failure of the participating institution to replace the person may result in suspension of institution from the exercise.
- **Involvement of Key Organization in the Process:** It is proposed that FIMA through CIMCO spearhead the whole initiative. Whether this organization is CIMCO or otherwise, it goes without saying that the ultimate outcome will be determined by how closely they supervise each step of the process. Close consort and understanding among members of participating institutions is vital for optimum benefit from this exercise.
- **"The Missionary Zeal":** It is indeed sad that we have to exemplify the required spirit in these words but that is exactly what is needed. Any quest for personal gain is going to go unanswered by Allah (SWT) in the next world. Therefore, the right intention (niyyah) must be implanted at the outset. Provided it is performed with a certain zeal and passion, the exercise is guaranteed to bring high level of institutional and even personal recognition but that should be taken as a byproduct and not the actual fruit of effort.

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Clinicians As Effective Researchers

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Abstract

This article addresses the commonly asked question: Can clinicians be effective researchers?

The author draws on historical discoveries by inquisitive physicians and his own experience, which involves extensive clinical research in various aspects of pulmonary medicine in the United States and his more recent experience of overseeing the development of research at King Fahd Medical City in Riyadh, a major tertiary care center in Saudi Arabia. From this experience, the author draws conclusions as to the key aspects required for successful research. These include inquisitiveness, patience, and perseverance on the part of the clinician, along with a nurturing and supportive environment and appropriate financial, emotional, and administrative institutional support. The importance of collaboration and, finally, the need for appropriate data collection and following the Belmont principles should be emphasized.

The author strongly believes that the answer to the question "Can clinicians be effective researchers?" is a most definitive "yes."

Keywords: *Clinical research, history of medicine.*

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Introduction

In December 2006, I was asked to help develop the research program at King Fahd Medical City (KFMC), a new tertiary care hospital in Riyadh, Saudi Arabia, consisting of four hospitals — general, rehabilitation, women's, children's — staffed by professionals from all parts of the world. As I began to establish the institutional review board (IRB) and plant the seeds for a research enterprise, some of the frequently heard responses were: "Why bother doing research in a clinically oriented hospital devoted to patient care?" "We are clinically oriented and do not have the expertise or know-how to do meaningful research." "We do not have the time." "We already have a job." "Give me the space and staff and I will do the research." I could add many more comments to the ones listed.

As I began to ponder the strategy to develop and answer some of these real concerns, I reflected on my own experience in the United States, where after basic medical training in Kashmir, with no experience in research, I ended up, unplanned I might add, doing a fair amount of clinical research. Over a two decade period, the research resulted in substantial grants and publications, including some original observations. I reflected on the studies that resulted in grants totaling more than U.S. $2.5 million from the National Institutes of Health (NIH), World Health Organization (WHO), American Lung Association, and pharmaceutical sponsors. Additionally, as chair of medicine at Nassau County Medical Center in New York, my department received an additional $4 million in grants for the state's primary care upweighting program and the HIV/AIDS Designated Center.

As I shared my experience with the interested staff at KFMC, the interest slowly started to blossom. One of the most popular presentations I made at KFMC and other institutions was "Clinicians as Effective Researchers." In this article, I will briefly outline the key characteristics of a successful clinical researcher, relying heavily upon my personal experience. Clinicians need a supportive environment within the institution and also a country that understands and invests in research and development with the anticipation of long-term benefits for the community.

The institutional and national priorities will not be addressed in detail in this article.

Individual's Role

The key element needed in a researcher is curiosity. The researcher should not be afraid to ask questions and should be willing to follow through and take chances. A few historical examples will bring home this point:

Werner Forssmann

In 1929, Werner Forssmann, 25-year-old intern from Germany, had been deeply impressed by a sketch in his physiology textbook showing a French

physiologist standing in front of a horse, holding a thin tube that had been put into the jugular vein in the animal's neck and then guided into one of the heart's chambers. He could not understand why this simple technique, which would avoid the complications of opening the chest, had not already been tried on humans. Forssmann asked his supervisor, Dr. Richard Schneider, for permission to try this procedure on a terminally ill patient. The request was flatly refused, and Schneider forbade Forssmann from doing the experiment at all on any person, including himself.

Forssmann decided to do the experiment anyway, in secret. With the help of nurse Gerda Ditzen, Forssmann successfully passed a ureteral tube through a large antecubital vein into his right atrium and confirmed this historical success with a chest Xray[1]. Thus began the era of intravascular catheterization, a procedure now taken forgranted and sometimes even overused and abused, as was the case with Swanz Ganz catheter.[2] It was Werner Forssmann's curiosity, persistence, and willingness to experiment on himself that resulted in the advent of intravascular catheterization, for which he received the Nobel Prize in Physiology or Medicine in 1956.

Victor Herbert

In 1959, Victor Herbert was a 32-year-old hematologist who believed, contrary to prevailing views, that dietary deficiency alone can result in folate-deficient anemias. Sometimes, experience with a single patient can change a researcher's thinking, and that was the case with Herbert when he saw an engineer who had retired from the Boston subway system and presented with a combination of scurvy and folate deficient megaloblastic anemia. Herbert learned that his patient, who was on a very tight budget, ate all his meals at a chain of fast-food hamburger stands in Boston. As Herbert stated: "After a diet of 15-cent hamburgers, donuts, and coffee for five years, my patient developed scurvy and megaloblastic anemia, which I believed was due to folate deficiency." To prove his hypothesis, Herbert went on a strict vitamin- deficient diet, and after 133 days of a folate-deficient diet, a weight loss of 26 pounds, a drop of hematocrit from 48-42%, and nine bone marrow examinations, Herbert developed megaloblastic anemia, confirming cause and effect.

Songtao Shi

Songtao Shi observed red tissue inside the deciduous tooth of his 6-year-old daughter. From these and other teeth Shi developed stem cells from human exfoliated deciduous teeth (SHED) at the NIH laboratories These cells have potential to develop dentin, which one day may be used to repair damaged teeth, induce regrowth of bone, and treat nerve injury or disease. This work is currently in progress.[3]

The Story of Stomach Ulcers: Acid or Bacteria?

As a student in Kashmir, I was taught that acid in the stomach is the cause of the very prevalent stomach ulcers in Kashmir. We would even provide milk via nasogastric tubes for hospitalized patients with stomach ulcers, the rationale being that the milk would neutralize the acid, which was supposed to be the cause of the ulceration. All this changed with the discovery of *Helicobacter pylori* (*H. pylori*) as a cause of stomach ulcers.

Helicobacter pylori was first discovered in the stomachs of patients with gastritis and stomach ulcers nearly 27 years ago by Barry J. Marshall and J. Robin Warren of Perth, Western Australia. At the time (1982-1983), the conventional thinking was that no bacterium can live in the human stomach, as the stomach produced extensive amounts of acid.

The bacterium had been observed in 1979 by Warren, a pathologist, who beginning in 1981 did further research on it with Marshall, a physician. After numerous unsuccessful attempts at culturing the bacteria from the stomach, they finally succeeded in visualizing colonies in 1982, when they unintentionally left their Petri dishes incubating for 5 days over the Easter weekend. In their original paper, Warren and Marshall contended that most stomach ulcers and gastritis were caused by infection by this bacterium and not by stress or spicy food, as previously assumed.[4]

To demonstrate that *H. pylori* caused gastritis and was not merely a bystander, Marshall drank a beaker of *H. pylori.* He became ill several days later with nausea and vomiting. An endoscopy 10 days after inoculation revealed signs of gastritis and the presence of *H. pylori.* These results suggested that *H. pylori* was the causative agent of gastritis. Marshall and Warren went on to show that antibiotics are effective in the treatment of many cases of gastritis. Warren and Marshall were awarded the Nobel Prize in Medicine in 2005 for their work on *H. pylori.*

Asbestos as a Carcinogen

In the 1960s Irving Selikoff documented asbestos-related diseases among industrial workers. This discovery came more or less inadvertently. In the 1950s Selikoff had opened a general medicine practice in Paterson, New Jersey. A few years later, the Asbestos Workers Union asked him to add their membership to his practice. Selikoff noticed several new cases of mesothelioma were diagnosed in a year in his practice, whereas the expected incidence was only about 5/100,000. This happened while the new cohort (asbestos workers) were still a small fraction of the clinic's patient list. This anomaly led Selikoff to examine the relationship between asbestos exposure and mesothelioma. He conducted various studies and established a link between asbestos and cancer. Asbestos-removal became a big issue; many large buildings contained tons of asbestos

embedded in walls and ceilings. Controversies arose, because the workers removing the asbestos opened up intact structures, scattered toxic dust around, and left chaos behind them. Laws were passed to require better planning, preparation, and cleanup procedures. The situation eventually improved. For his pioneering work Dr. Irving Selikoff received many awards, including the Albert Lasker Award for Clinical Medical Research.

There are many examples of such astute observations by curious practicing physicians, which are highlighted in the book, *Who Goes First.*[1]

What is Research?

The common perception of research is experimenting in a laboratory. A more appropriate definition of research, in my view, is careful investigation into some subject or area of study with the aim of discovering and applying new facts or information, in short , acquiring new knowledge that eventually leads to better patient care. The examples I cited above are classic cases of research, which fit this definition. One could expand the scope and do research in areas such as epidemiology, why people smoke knowing that it is harmful; why obesity is becoming so prevalent, particularly in some ethnic groups; why Saudi Arabia has the highest incidence of spinal cord injuries from road traffic accidents; why Saudis drive the way they do; why some centers have better outcome in common conditions such as myocardial infarction, stroke etc. what is the most effective way of delivery of health care; and why, in spite of spending the largest amount of money per capita on health care in United States, the country does not have the best outcomes in objective parameters of health delivery. These are some of the many areas of great interest awaiting clinicians' research.

Two Examples from Personal Experience

Data Collection

After completing my training in medicine / pulmonary medicine, I worked in a newly established respiratory intensive care unit in Queens Hospital Center (QHC) in New York. It became apparent very quickly that a significant number of the patients admitted who became intubated were developing complications manifesting as massive gastrointestinal (GI) bleeding, renal failure, nosocomial infections, and tracheal complications from endotracheal tubes and tracheostomies. To develop data regarding the incidence, causes, and impact on morbidity and mortality of these complications, with the help of the cooperative nursing staff and an investment of 85 cents in a notebook, we recorded all admissions and marked any complications that developed. At the end of the week, I analyzed this data, and over a month's admission of 25 to 30 patients we would have a few GI bleeders and a few with other complications. Gradually, over a period of several months, we

had data on hundreds of patients and, during my stay at QHC, I accumulated data on more than 3,000 patients. The nursing staff did the data entry, while I reviewed the accumulated data. There was no protected time in a busy public hospital. We found an incidence of more than 10% with massive GI bleeding, requiring a transfusion of two or more units of blood. To reduce the incidence of GI bleeding, we adopted a gastric neutralization program, initially with antacids and later on with H2 blockers, with dramatic improvement. We reported the largest series on this subject.[5] We had similar experience in addressing complications of renal failure, and tracheal complications. After presenting our findings at national meetings, we were asked to write a monograph on the subject.[6] The take-home message from this experience is that you need to have accurate reliable transparent data and from such accumulated experience one can make interesting observations, which can lead to better patient care.

Lengthy Investigation and Research

In mid 1980s I served as an external examiner for the medical school in Amman, Jordan. One of the short cases presented was that of a boy in his teens with classic saccular bronchiectasis. The diagnosis was obvious, and the students had no difficulty in describing the clinical findings. However, later that evening, Professor Naif Sliman posed the following question: "The case of bronchiectasis you saw today is rather unusual in that he and several of his brothers have the same problem, and they are challenged intellectually. The sisters and other siblings do not have this problem, can you help us sort this out?"

It was clear that there was some inherited genetic disorder affecting some, but not all, male siblings in this rather large Palestinian family of 14-plus siblings. We went through the usual differential diagnosis, did the chromosome analysis, studied the cilia from the affected patients, and conducted other routine investigations. The affected family was living in a refugee camp in Jordan, and I was in New York. This created many interesting challenges in logistics. We had to seek the assistance of experts from diverse fields involving genetics, ciliary sampling, and motility studies. After 15 years of collaboration and work with many investigators in Amman as well as in the United States in Atlanta, Georgia; Stony Brook, New York; and Charleston, South Carolina, we were able to identify a new inherited genetic disease.[7] The lessons learned from this experience are that investigation and research can take a long time. One needs to be patient and, most important, one needs to collaborate with the appropriate investigators within and outside the parent institution. This study "research" took 15 years.

Ethics in Research

After serving on the board of the

professional medical conduct in New York, it became apparent to me that physicians are not immune to ethical lapses. This becomes even more important in research where patients are entrusting the physicians to being tested with an unproven, often not approved, medication or device. Two personal examples will highlight this.

a) I did sizable clinical research in the application of fluoroquinolones in respiratory tract infections. As our team published and presented our findings in professional meetings, I began to receive requests from several different pharmaceutical companies to test their brand of fluoroquinolones. One such product had obvious neurologic complications, every third or fourth of my enrolled patients had some evidence of neurologic stimulation: irritability, sleeplessness, and even seizures. I felt exposing my patients to such side effects was not appropriate and quickly informed my IRB that I was canceling the study.

b) While studying Ciprofloxacin, which had been showing excellent clinical results[8] one of our enrolled patients had a grand mal seizure, which she never had before. After careful clinical investigation, we determined it was most likely the result of a very high blood theophylline level resulting from the interaction between the Ciprofloxacin and theophylline. Up to that time, Ciprofloxacin had not been known to increase the blood theophylline level. The sponsoring company was quickly advised of this complication, and, to its credit, it encouraged us to study this interaction in greater detail, which we did and thus established the Cipro-theophylline interaction.[9]

The point of these two examples is that because complications can occur while doing research, it is the investigators' responsibility and moral/ethical duty to weigh the risk/benefit ratio carefully, keeping the patients' interest and well-being uppermost in mind.

Dr. Stephen E. Straus is a highly respected researcher at the NIH. He was the principal researcher in a research study on a new investigational drug for the treatment of hepatitis. Five patients he treated at the NIH hospital in Bethesda, Maryland, died, which led to news reports and congressional hearings. The study was discontinued, and eventually he and his colleagues were cleared of any wrongdoing. Later on they found out that the investigational drug was a mitochondrial poison leading to severe metabolic acidosis. Straus regularly presents this incident at the annual NIH course on research. Understanding the importance of unanticipated risks in clinical research is highly recommended for all who do clinical research.[10]

Financial Support

Developed countries have recognized that support for research and development pays rich dividends in the long run. The amount invested in research and development in Japan is 2.9% of the gross domestic product (GDP). In the United States and Europe, it averages between 1.5% and 3% of the GDP. The Southeast Asian countries average 0.89% of their GDP, and in the Arab countries it averages only 0.23% of the GDP, with the exception of Qatar, where the percentage is 2.8%. These numbers translate to $19 per person in Saudi Arabia, $665 per person in the United States, and $649 per person in Japan. In developed countries, the private sector plays a major role in supporting research and development. For example in the United States, the government provides the NIH with an annual budget of around $28 billion, whereas the private sector support for research in the United States is estimated to be double that amount.

A good example of the rich returns for research investment are evident with the recent epidemic of HIV/AIDS, which, in the mid 1980s, had no treatment and had a very high mortality rate. If this trend had continued, it is estimated that in the United States we would have more than 200,000 hospital beds occupied by AIDS patients. Thankfully, with an investment of $10 billion dollars over 10 years the virus was identified, drugs were discovered, and the treatment of this deadly disease changed from inpatient treatment to outpatient long-term care. Thus the $10 billion investment saved $1.4 trillion in health-care costs, or a 1:140 return [11].

Summary

Based on the author's personal experience as a clinical researcher and having overseen the expanding research at KFMC since 2007, where the submissions of research proposals have grown from 27 in 2007 to 62 in 2008. Submissions are projected to reach close to 100 in 2009. The key factors for success in research are intellectual curiosity; asking the key questions; "but why," persistence; follow up to test hypotheses; honesty and integrity in collecting data; reporting all findings, both the expected and the unexpected; assessing what is available and doable in the place you work, as there is no point in doing research in transplantation if your institution does not have a transplant program; and most of all, learning to collaborate and cooperate. On top of that, there is an element of luck involved, being in the right environment, having access to role models, and having a helpful mentor and cooperative peers.

Follow Up

All of the good work is of little value if it does not get presented or published so the results of the investigators' work can be shared with a larger community. Here are a few suggestions in getting the material published: The qualities of the manuscript and the journal must match;

evaluate journal quality by its editorial office, publishing, and distribution factors; read the instructions to authors carefully; and novelty, creativity, and level of interest are important factors. The abstract you submit must have all key findings and elements listed; check for methodological quality; register human studies/clinical trial; place your findings in perspective; ensure clarity of presentation; avoid paucity of data; check the appropriateness of the statistical methods; emphasize the clinical significance of the study; and, most important, do not get disheartened if you receive a rejection. The rate of acceptance in high-impact journals can be as low as 10-15% of all submissions. I have had my share of rejections over the years.

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Ethics of Clinical Research: An Islamic Perspective

Hossam E. Fadel *

Abstract

Medical progress depends on clinical research which has to involve, at some point, human subjects. The human rights of research subjects must be protected. Ethical principles and guidelines have been developed by international organizations; the World Medical Association (WMA) and the Council for International Organizations of Medical Sciences (CIOMS). The Islamic Organization for Medical Sciences (IOMS), Kuwait, convened a meeting in Cairo, Egypt 2004, and produced a document advancing an Islamic viewpoint on these principles and guidelines.

In this paper I discuss all these documents. The guidelines developed by CIOMS are in general agreement with Islamic principles i.e. respect for the person, bringing benefit, avoiding harm, and justice. However some differences exist to which I alluded. I also added some personal opinions.

Muslim physicians and scientists should get involved in clinical as well as other medical research. It is *fard kifāya* (collective religious duty). They should be familiar with the ethical principles and guidelines and abide by them in their own research. Also, they should monitor externally sponsored research in their own countries to ensure that these guidelines are followed.

Keywords: *Clinical research, ethics, Islam, Declaration of Helsinki, Council for International Organizations of Medical Sciences, Islamic Organization of Medical Sciences.*

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Introduction

Academicians in faculty positions are traditionally involved in clinical research. Private practitioners can and should be involved in clinical research as well.[1] A requirement of clinical research is that it conforms to internationally recognized ethical guidelines. For Muslim physicians, conforming to Islamic ethical guidelines is an added requirement. In this article, I will discuss the international guidelines and Islamic viewpoints regarding these guidelines.

Muslim Obligation to Conduct Research

Muslim countries are, in general, lagging behind in research including medical research despite their collective material and human potential. This is very ironic noting that Muslim physicians of the past were the pioneers of scientific and medical research and were the first to employ scientific experimentation.[2-5]

It is worthwhile to emphasize the importance laid by Islam on the pursuit of learning. There are several Qur'anic verses and traditions of the Prophet (PBUH) to that effect. The first revealed verses of the Quran state:

> *Recite in the name of your Lord, Who created. He created man from a leech-like structure. Recite, and your Lord is Most Generous, Who has taught by the pen. He taught Man that what he knew not.*[6]

Allah (SWT) also says, addressing the Prophet (PBUH),

> *Say, "My Lord, increase my knowledge."* [7]

Allah (SWT) asks us to look inside ourselves and at the universe to discover God's laws.

> *Let man consider from what he is created.*[8]

And in another verse:

> *Will they not reflect on camels, how they are created; the sky, how it is raised; the mountains, how they are erected; and the Earth, how it is leveled.*[9]

Learning in Islam is not limited to religious studies. Early Muslim scholars used to acquire an extensive knowledge, not only in jurisprudence (*fiqh*), *Qur'an* and linguistic studies, but also in medicine, chemistry, and natural sciences. Knowledge has to be based on evidence. Allah (SWT) says:

> *...Can there be another god besides Allah? Say bring forth your proof if you are telling the truth!*[10]

Based on the above, scientific research is considered by some scholars as *fard kifāya* (collective religious duty). The Prophet Muhammad (PBUH) is reported to have said:

> Allah created disease and its cure except senility (death). Sons of Adam, seek the cure but do not use *haram* (forbidden) things.[11]

This hadith makes it incumbent on us to investigate the causes of disease and to try to find cures. This can only be achieved by undertaking both basic and clinical research.

International Ethical Guidelines for Clinical Research

Clinical research must rest in part on experimentation involving human subjects. Research involving human subjects creates a lot of potential pitfalls that unfortunately led to tragedies in the last century. The most well-known of which are the experimentation by Nazis on the prisoners and the Tuskegee study of untreated syphilis[12] in USA. This study was conducted by the US Public Health Service (USPHS). Over the period of 40 years (1932-72), 399 syphilitic African Americans were followed without treatment to study the natural course of the disease.[13-6] The study patients were never informed of the availability of Penicillin which was found to be an effective treatment for their disease in the late forties. The Nuremberg Code was promulgated in 1947 as a direct consequence of the trial of Nazi physicians who conducted research on the prisoners of World War II without their consent. The United Nations General Assembly adopted the Universal Declaration of Human Rights in 1948 and the International Convention on Civil and Political Rights in 1966. Its article seven states in part: "In particular, no one shall be subjected without his free consent to medical or scientific experimentation."

In parallel with these efforts, medical professionals worked on formulating principles of ethical use of human subjects in research. The first such document, the Declaration of Helsinki, was adopted by the World Medical Association (WMA) in 1964 in Helsinki, Finland. This was updated several times. The last was in Seoul, South Korea in 2008 at the WMA 59th General Assembly Meeting.[17] The central point of the Declaration is that medical research should be subject to ethical standards that promote respect for all human beings and protect their health and rights.

The Declaration of Helsinki consists of 35 articles divided in 3 sections. These are an introduction, "Principles for All Medical Research" and "Additional Principles for Medical Research combined with medical care".

This document stresses that in the field of biomedical research, fundamental distinction should be recognized between medical research in which the aim is essentially diagnostic or therapeutic for a patient and medical research the essential object of which is purely scientific and without direct diagnostic or therapeutic value to the person subjected to research. Medical research should be subject to ethical standards that promote respect for all human beings and protect their health and rights.

The Declaration of Helsinki also stresses the fact that some research participants are vulnerable and need special protection. The research should be approved by especially appointed Ethical Review Committees. Each potential research subject should be adequately informed of the aims,

methods, sources of funding, and potential risks of the study. They should be informed about their right to abstain from participation or to withdraw from the study without any reprisal. For a research subject who is a minor or legally incompetent, the investigator must obtain informed consent from the legal guardian. These and other vulnerable groups should not be included in research unless it is necessary to promote the health of the particular group from which they are recruited.

In the United States, the US National Commission for the Protection of Human Subjects of Biomedical Research was created in 1974 and produced the Belmont Report in 1979 which distilled principles of ethics related to research.[18] It addresses boundaries between medical practice and research; basic ethical principles such as respect for persons, beneficence, and justice; and informed consent, assessment of risks and benefits, and selection of subjects.

Another international organization, The Council for International Organizations of Medical Sciences (CIOMS), was founded in 1949 under the auspices of the World Health Organization (WHO) and the United Nations Educational Scientific Cultural Organization (UNESCO). CIOMS, in association with WHO undertook its work on the ethics of biomedical research in the 1970s . It produced guidelines to enable the effective application of the ethical principles set forth in the Declaration of Helsinki, particularly in developing countries. Their first report was published in 1982. Following that, there were major developments such as the outbreak of the HIV/AIDS pandemic and proposals to undergo large scale experiments with vaccines and medications. There were also rapid advances in biotechnology and an increase in multinational field trials involving vulnerable populations in developing countries. These developments raised new ethical issues and in 1996 CIOMS updated its report and published *International Ethical Guidelines for Biomedical Research involving Human Subjects* and updated it in 2002. This consisted of a statement of general ethics, a preamble and 21 guidelines.[19]

The Islamic Viewpoint on CIOMS Guidelines

The Islamic Organization of Medical Sciences (IOMS), based in Kuwait, translated this document into Arabic. It was then reviewed by a scholar of Islamic Jurisprudence principles. The document along with the latter's comments were discussed by a group of Muslim scholars, physicians, including myself, and other individuals with interest in ethics and the law. The Islamic viewpoint on each of these guidelines was studied in depth by this group and discussed in a three day conference held in Cairo, Egypt, December 2004. The results of these deliberations were published as the *International Ethical Guidelines for*

Biomedical Research involving Human Subjects: An Islamic Perspective.[20] In this paper I will summarize the CIOMS guidelines, the IOMS document, and add my personal opinions.

The CIOMS guidelines as well as the principles of the Declaration of Helsinki are based on the generally accepted ethical principles of respect of person, beneficence, nonmaleficence and justice.[21]

These four principles are in agreement with Islamic rules. Allah (SWT) says

"We have honored Adam's children."[22]

Respect of the person is a major aspect of the dignity of a human being. Respect of the person gives him the right to make his own choices and decisions. In the context of research it means that no one should be involved in a research project without his free and voluntary consent. The Islamic principle that applies here is "No one is entitled to dispose of the right of a human being without his permission." [20]

A basic purpose of Islamic law is to "secure benefits for people and to protect them from harm". [20] This is termed beneficence in our lexicon at present. Another Islamic law states that "every action that leads to harm or that prevents a benefit is forbidden. That is what is now called "nonmaleficence." In cases where benefit and harm are not absolute, which is the usual case in biomedical research, the rule that applies is that "if a less substantial instance of harm and an outweighing benefit are in conflict, the harm is forgiven for the sake of the benefit".

Justice is an established principle in Islamic law. Allah (SWT) says

"God enjoins justice and charity."[23]

Justice means equity and fairness, and charity is either the acquisition of benefit or the prevention of harm.

Now, I will discus these guidelines individually.

Guideline 1: Ethical Justification and Scientific Validity of Biomedical Research involving Human Subjects

In agreement with this guideline, the performance of research on human subjects is Islamically acceptable. However, it should be useful and responsive to the five purposes of Islamic law (*maqāsid al-sharī`ah*), i.e. the safeguarding of one's religion, life (and health), intellect, progeny, and property/resources, and that it should not cause harm. On the other hand, a person who pursues scientific knowledge to cause harm is subject to God's wrath. God (SWT) says,

> *And they learn what causes them harm and brings them no benefit, and they already know that whoever purchases it has no share in the hereafter.*[24]

The Prophet (PBUH) asked God's refuge from learning that brings no benefit.[25] The research should by no means lead to something prohibited. A researcher should comply with

the framework of Islamic law in any research he undertakes. Moreover, a researcher should observe the rules and ethics of the profession especially as they relate to the ethics of biomedical research. To be more specific, the research is Islamically acceptable under the following conditions:

1) The purpose of the study is to secure an absolute benefit i.e., enhancing human health, or to prevent an instance of absolute harm which impairs health, or to give priority to securing an outweighing benefit over preventing a less substantial instance of harm.

2) The benefit does not violate a legal stipulation nor contradict any absolute ruling of Islamic jurisprudence.

3) The research itself should be legitimate i.e. both the means and ends must be legally permissible.

4) The design of study should be scientifically sound so that it should be more likely to achieve the purpose it is expected to accomplish. This is based on the rule that "every action that ceases to pursue its objective is unacceptable." [20]

5) That the research team is qualified and competent to conduct the research as consistent with the Qur'anic guidance *"God enjoins you to deliver your trusts to their rightful owners"*[26]

And the Prophetic saying "Allah loves the person who is performing a job, to do it in the best possible way."[27]

Guideline 2: Ethical Review Committees

This guideline addresses the formation and role of the ethical review committees. A universally accepted standard is the establishment of ethical review committees to evaluate biomedical research and to ensure that its purpose and methodology are in accordance with the ethical guidelines. This concept is Islamically ordained. Medicine and biomedical research are so important that it needs to be practiced under supervision. In that regard I like to point out the fact that Muslims were the first to establish the practice of licensure to physicians and the system of *Hisba* (inspection).[28] This was meant to ensure that all people in trades, including physicians, were behaving justly.

The ethical review committees usually called institutional review boards (IRBs) committees consist of scientists, physicians, lay people and legal personnel. In an Islamic country, it is recommended that the ethical review committee gets the opinion of an Islamic jurisprudence (*fiqh*) committee to be certain that the proposed study is within the guidelines of Islam. An Islamic rule is "A responsible adult is not to embark on any undertaking before he finds out how it is regarded by God." [20]

The guideline that ethical review committees should be independent of the research teams and sponsors is

in agreement with Islamic principles. The ethical review committee is in effect giving testimony. For such to be Islamically acceptable, it must be made by a neutral party. To satisfy the requirement of validity of testimony, any material or nonmaterial rewards for the committees should not be contingent on the outcome of the review (testimony).

Guideline 3. Externally Sponsored Research

In case the research is externally sponsored, i.e. by an institution or an industrial or drug company from another country, the scientific and ethical review should be conducted objectively, independently and honestly in the country of the sponsoring organization. This is to guarantee that the standard ethical controls are applied. These should not be less stringent when applied in another, possibly less-developed country, than the controls normally applied in the country of the sponsoring organization, as all members of the human race should be treated equally. Equity for all people is a basic tenet of Islam. Allah (SWT) says:

> *"O mankind reverence your Guardian Lord who created you from a single person".*[29]

In addition, another ethical review should be conducted in the host country to make sure that the proposed research meets the health needs and priorities of that country. One of the purposes of Islamic law is "To place everything in its right place [on the list of priorities]" [20]

Guideline 4. Individual Informed Consent

This guideline stipulates that the investigator must obtain a voluntary informed consent from each prospective study subject. This is in conformity with Islamic law that calls for respect of the independence of every individual, his right to make his personal choices and arrive at decisions suitable for him, without any trace of coercion or deception, and his right to be protected from injury, misleading inducement, or exploitation by others The consent should be given willingly after the subject, if fully competent, receives and understands the necessary information. This is stipulated in the *fiqh* rule, "No one is entitled to dispose of the rights of a human being without his permission" and "no right of a human being can be cancelled without his consent."[20] The information should be given in a written format in a language easily understood by the individual, and the consent should be documented.

Guideline 5. Essential Information for Prospective Participants

This guideline details the necessary information that should be given to the potential subjects for the research. The informed consent should be given with full knowledge and correct understanding, on the part of the subject of the content of his consent.

Guideline 6. Obligations of Sponsors/ Investigators

This guideline details the duties of both the sponsors and investigators to give the subjects accurate information and neither withhold any information that may negatively influence the potential research subjects' decision to consent nor deceive them in any way. They should not include any explicit or implicit threats in their discussions with the potential subjects. Islamic jurisprudence stipulations support this guideline. These stipulations are "mutual agreement can not be reached under conditions of ignorance," and "consent to an unknown thing and acquittal from an unknown thing are not valid." [20]

Guideline 7. Inducement to Participate

There is no objection, from the Islamic point of view, to compensate research subjects for lost earnings, transport and other expenses that might be incurred as a result of participating in the research. Actually, the rule of reparation and the principles of justice and fairness make it necessary to compensate the subjects adequately for what they have paid. Additional financial or in-kind payments made to induce participation in research may imply undue inducement. If it pressures the subject to give consent not based on conviction, then it is legally prohibited. However, if such payment does not influence the subject's decision making and he gives his consent, with his free will, his consent in Islamic jurisprudence is valid. Nevertheless there should be – in my view – some restriction. The additional payments given to a poor person, or the provision or even the promise of medical care to a person who does not have access to that care in less developed countries or uninsured individuals in Western societies, could be a significant inducement that may cloud the ability of the person to make a true informed decision. The person may consent to participate and expose himself to certain risks he would avoid were he is not in need of such incentives.

Guideline 8. Benefits and Risks of Study Participation

The investigators must ensure that potential benefits and risks are reasonably balanced and the risks are minimized. The need to strike a balance between potential benefits and risks in research involving human subjects, with the prospective benefits being more likely and the need to minimize risks, is included in a basic principle of Islamic Law, "if a less substantial instance of harm and an outweighing benefit are in conflict, the harm is forgiven for the sake of the benefit." If a benefit and an instance of harm are in conflict, priority should be given to the weightier of the two.[20]

It is acceptable from a religious perspective to use the expected, significant benefits to society as a justification of the risks interventions pose to an individual who has no possible direct diagnostic, therapeutic,

or preventive benefit. This is based on a rule of jurisprudence, "Public interests take precedence over private ones."[20] This is different from the Helsinki Declaration and the CIOMS guidelines which emphasize that individual benefit precedes social benefits. This point needs further study by Islamic scholars. They need to determine to what extent public interest supersedes individual interest as it relates to human clinical research.

Guideline 10. Research in Populations and Communities with Limited Resources

Before undertaking research in a population or a community with limited resources, the sponsor and investigator must make every effort to ensure that the research is responsive to the health needs and priorities of the community in which the research will be conducted. Also, any knowledge generated or any intervention or product developed as a result of that research must be made reasonably available for the benefit of that population or community.

This guideline is consistent with the Islamic principle of justice and charity.[23]

Guideline 11. Choice of Controls in Clinical Trials

This guideline can also be endorsed from an Islamic point of view as it requires the researchers to observe, in dealing with human subjects, the obligation of trust when choosing the method of intervention to protect their human rights fully and ensure their safety. *"God enjoins you to deliver your trust to their rightful owners."*[26]

Whether the use of a placebo arm in clinical trials is ethically acceptable has been vigorously debated.[30] Against objection by scientists, the 2000 version of the Helsinki Declaration specifically prohibits the use of placebos except in limited situations. CIOMS recommends the use of equivalency trials or add-on studies. Equivalency trials compare an investigational intervention with an established effective treatment and produce scientifically reliable data. An add-on design may be employed when the investigational therapy and a standard therapy have different mechanisms of action. The treatment to be tested and the placebo are each added to the standard treatment to determine if the investigational therapy leads to a better outcome or to fewer side effects.

If the use of a placebo arm is essential for the clinical trial to produce useful information and there is no resulting harm to the subjects in the control arm, it will be Islamically acceptable. The rationale for that is that "although a sort of deception is practiced, the consequences are safe." [20] In my view, it may cause harm if the research subject in the control arm is deprived of a currently accepted treatment. I believe that the concerned ethics review committee has to carefully examine each specific case, evaluate the possibility of harm to the subjects in the placebo arm and try to work with the investigator to find an alternative study design.

Guideline 12. Equitable Distribution of Burdens and Benefits in the Selection of Groups of Subjects in Research

This guideline is again in harmony with Islamic law which calls for justice in all affairs of life.[23] So, it is unfair that participants in a study share in the burdens i.e. the potential side effects or other hardships but they do not share in the benefits when a successful intervention is achieved but is not made available to them.

Guideline 13. Research Involving Vulnerable Persons

These include persons with limited capacities or freedom to consent or decline to consent. They may be mentally incapacitated, elderly people who developed varying degrees of dementia, residents of nursing homes, people receiving welfare benefits, the unemployed, patients in emergency rooms, some ethnic or racial minorities groups, homeless persons, nomads, refugees, prisoners and patients with incurable diseases. Junior or subordinate members of hierarchical groups, for example medical and nursing students, employees of pharmaceutical companies and members of the armed forces or police, are all considered vulnerable groups. Their agreement to volunteer may be influenced by the expectation of preferential treatment if they agree and retaliation if they refuse.

Ethical justifications for the involvement of these vulnerable groups are:

1. The research could not be carried out equally well with less vulnerable persons.
2. The research will lead to improved treatment of health problems unique to the vulnerable class.
3. They are assured that they will have reasonable access to any product that comes out of the research
4. The risk is minimal.
5. The agreement to participate is supplanted by the permission of a legal guardian or other appropriate representative.

This CIOMS guideline is in conformity with Islamic law. These individuals need their rights and interests protected. They should not be forced, pressured, deceived, or subjected to exploitation of their psychological condition or financial difficulties in order to make them consent to be research subjects. Such coercion or exploitation involves injustice that is disapproved by Islamic law. In a divine tradition, Prophet Muhammad (PBUH) quotes his Lord (SWT), as saying,

"My worshippers, I have forbidden injustice on my part and made it forbidden among you, so do not be unjust to one another".[31]

Thus, a special justification of recruiting vulnerable individuals to serve as research subjects is required in Islamic Law, and, as stipulated in the CIOMS

guideline, strict measures to protect their personal rights and interests should be taken.

Guideline 14. Research Involving Children

The participation of children is essential in research on childhood diseases and treatments given to children including medications and vaccines. However, the researcher must ensure that the research could not be carried out equally well in adults and that the knowledge to be acquired is relevant to the health needs of children. Further, a parent or guardian must give permission and the assent of the child should be obtained to the extent of that child's capabilities and a child's refusal to participate or to continue in the research should be respected.

Under Islamic rulings, a child under the age of puberty is incompetent and his "consent" to participate in biomedical research is not valid. Moreover, in variance with this CIOMS guideline, Islamically the permission of the guardian is not legitimate except a) when there is an absolute or outweighing benefit or when the child's condition needs urgent participation b) when there is general need to conduct research relevant to children's diseases, drugs or vaccines and c) if the risks involved do not exceed what is associated with a normal medical or psychological examination of the child or when the increase in risk level is slight and approved by an ethical review committee. These special circumstances are considered "necessities which render permissible what is usually prohibited" in Islamic law. [20]

In another variance from the CIOMS guideline, a child's objection to participate in the study is not taken in consideration. The authority to withdraw from a study is only given to the guardian. An exception would be if the child is perceptive i.e. is close to puberty and his perception skills have developed sufficiently even though he is still under a guardian.

Guideline 16. Women of Reproductive Age as Research Subjects

Investigators should not exclude women of reproductive age from biomedical research. If participation may be hazardous if a woman conceives, the investigator/sponsor should offer them pregnancy testing and provide them with access to effective contraception before the research.

In agreement with this guideline, Islamic jurisprudence considers the exclusion of women of reproductive age from biomedical research as unjust because it deprives them from potential benefit. Their participation is conditional on voluntary informed consent, including information on the precautions taken to spare her and her fetus, if she becomes pregnant, from any hazards. In Islamic law, it is unacceptable for the permission of a husband to replace that of his wife. That would be an affront to her human rights. Although not a requirement, it

is preferable for a married woman to obtain her husband's consent.[20] No such point is included in the CIOMS guidelines.

Guideline 17. Pregnant Women as Research Subjects

Research involving pregnant women is complicated by the fact that it may present potential benefits and risks to two beings; the woman and her fetus. However, pregnant women should be presumed to be eligible for participation in biomedical research as long as they are adequately informed about the benefits and risks to themselves, their pregnancies, their fetuses, their subsequent pregnancies and their fertility. The research should be relevant to the particular health needs of pregnant women in general. Investigators should include in their protocols a plan to monitor the outcome of the pregnancy with regard to both the health of the woman and the short- and long-term health of the newborn.

Islamically, there is no objection to the participation of pregnant women in biomedical research because of the potential benefit to them and to their fetuses that can be derived from such research. Ideally, before enrolling pregnant women in biomedical research, the investigators should rule out any harm to the fetus. However that is almost impossible to achieve. The safety of new medications can not be assumed from animal experiments or from the study of the pharmacology of the used medication. There will always be some risk. Islamically, accepting the possibility of such harm would nevertheless be permissible if the mother or the fetus is likely to gain an absolute or outweighing benefit. When there are potential risks for the fetus, even when they are minor or outweighed, the investigator should also obtain the consent of the father. This is not a requirement of the CIOMS guidelines. It states "..it is desirable in research directed at the health of the fetus to obtain the father's opinion also, when possible."[20]

In some instances, the clinical trials are meant for the treatment of the fetus and not the mother. In these cases there are more risks to the mother without any benefit to her. In my opinion the most obvious example is in utero (prenatal) fetal surgery to correct a fetal birth defect. In these cases, the maternal instinct may unduly influence her to agree to such trials. Ethically and Islamically, the investigators should make an extra effort to explain the trial, the potential benefit to the fetus and the potential complications in the neonatal management, the short and long term prognosis for the fetus/neonate/child and especially the short- and long-term complications for the mother before she agrees to participate in the trial. Safeguards should be established to prevent undue inducement to pregnant women to participate in the research for the sole benefit of the fetus. In these circumstances I recommend that the ethics review committee establishes a

special counseling team independent of the investigator.

Guideline 18. Safeguarding Confidentiality

The subjects' research data should be held in strict confidentiality. However, the subjects should be told the limits, legal or otherwise, to the investigator's ability to absolutely safeguard confidentiality and the possible consequences of possible breeches of confidentiality.

Safeguarding confidentiality is a basic tenet of Islamic law. This is the "trust" between an individual and the physician/investigator. Exceptions from the requirement of safeguarding confidentiality are made in cases where concealing the confidential information causes greater harm for the person involved than that caused by revealing it or when revealing it brings a benefit that outweighs the harm of concealing it. This is based on the rule of the permissibility of commission of the lesser of two injuries to prevent the greater injury. Also, there are cases where revealing confidential information is permitted because it brings a social benefit or prevents public harm. [20]

Guideline 19. Right of Injured Subjects to Treatment and Reparation

Research subjects are entitled to free medical treatment when they incur any injury or any other harm as a result of their involvement in the research. They are also entitled to equitable compensation for any impairment, disability or handicap that result from their participation. In the case of death, their dependents are entitled to compensation. Their entitlement is based on the principle of justice, the fourth principle of ethics. The same is true from the Islamic point of view. This is based on the Islamic legal rule of reparation, which makes it an obligation for a person who causes any damage to another to make equitable compensation for the loss. When a subject dies as a result of his participation in research, his heirs are entitled to monetary compensation, which is the blood money stipulated in Islamic legislation for accidental homicide. The implicit agreement between research sponsor(s) and involved subjects entails a religious responsibility on the part of the former party to make up for the damages suffered by a subject as a result of participation in the research. However, it was pointed out during the deliberations in the Cairo conference that it is permissible for the investigators or sponsors to obtain in advance the subjects' informed consent to waive the investigators' responsibility, including their research subjects' entitlement to compensation for disability and handicaps, when they are not deliberately caused based on the fact that Islamically, a competent individual is entitled to waive voluntarily any right of his, provided that he does that completely voluntarily without any pressure, inducement or deception[20]. While this is true, in my opinion there is danger of it being abused as it will be impossible

to prove that the waiver was given truly voluntarily. I would think that waiving of the right to reparation ought not to be permitted. In my view, allowing waivers will make the investigator less careful in avoiding harm to the research subject. Further, I believe there is a difference between harm resulting from accepted treatment versus that resulting from investigational treatment in the course of conducting a clinical trial. CIOMS guideline 19 specifically prohibits such waivers.

Guideline 20. Strengthening Capacity for Ethical and Scientific Review and Biomedical Research

In externally sponsored research, sponsors and investigators have an ethical obligation to ensure that biomedical research projects for which they are responsible in the host countries contribute effectively to national or local capacity to design and conduct biomedical research and to provide scientific and ethical review and monitoring of such research.

Guideline 21. Ethical Obligations of External Sponsors to Provide Health Care Services

External sponsors are ethically obliged to ensure the availability of health care services that are essential to the safe conduct of the research and for the treatment of subjects who suffer injury as a consequence of the research as well as the availability of services to make a beneficial intervention developed as a result of the research reasonably available to the population.

Guidelines 20 and 21 both fall under the Islamic principles of justice and charity and that of reparation previously discussed.

Summary of the Differences Between The Islamic Viewpoint and CIOMS Guidelines

Few differences exist between the two documents. A major difference is the importance that Islam puts on 'public interest.' It takes precedence over private interest in special cases. This contrasts with guideline eight as well as with the Declaration of Helsinki.

CIOMS guideline 14 requires the consent of the guardian for a child to participate in research study. Under Islamic rulings this is also necessary but the permission of the guardian is legitimate under strict conditions outlined above. Further, the CIOMS guideline stipulates that the assent of the child should be obtained if possible. Islamically, that is not required. At the same time, the child's objection to participation in the study is not to be accepted if the guardian believes that participation is beneficial. On the other hand, the CIOMS guideline respects a child's objection to participate.

When recruiting a married woman for research, it is Islamically preferable to obtain the husband's consent. This is not included in CIOMS guideline 16. When recruiting a pregnant woman for a research study, if there is any potential risk to the fetus even when minimal or outweighed, the husband's consent should be obtained according

to Islamic rulings but not according to CIOMS guideline 17.

Islamic rulings allow revealing confidential information if it brings social benefit or prevents public harm. This is not mentioned explicitly in CIOMS guideline 18 but is implied in certain situations. The concept of public versus private interest is again invoked here as in the discusson about guideline eight. It needs further elaboration by Islamic scholars.

Another difference relates to guideline 19. Whereas Islamic rulings will allow waiving of liability against the investigator(s) under certain conditions, the guideline prohibits such waivers. I expressed my stand against the waiver.

Integrity in Clinical Research

It has been stressed in guideline 1 and in the Islamic prerequisites for research that the investigators should be qualified and competent to conduct the study by virtue of their education and experience. I believe it is important to add that they need to be honest. Although honesty is implied in competency, it is better and more practical to have it as a separate trait. Integrity or honesty can be manifested in two aspects. The first is for an investigator, upon noting unexpected side effects or harm to the study subjects, to discontinue the study and notify the concerned IRB or ethics review committee. An example of this has been reported.[32] The second aspect is to never falsify research data. Unfortunately, there have been instances of "competent" researchers falsifying data.

Article 30 of The Declaration of Helsinki touches on the subject:

Authors, editors and publishers all have ethical obligations with regard to the publication of the results of research. Authors have a duty to make publicly available the results of their research on human subjects and are accountable for the completeness and accuracy of their reports. They should adhere to accepted guidelines for ethical reporting. Negative and inconclusive as well as positive results should be published or otherwise made publicly available. Sources of funding, institutional affiliations, and conflicts of interest should be declared in the publication. Reports of research not in accordance with the principles of this Declaration should not be accepted for publication. [17]

These points can not be stressed enough. Islam stresses honesty and truthfulness. It abhors false testimony under which falsification of scientific data falls:

> *"O you believe! Be staunch in justice, witness for Allah even though it be against yourselves or your parents or your kindred …"* [33]
>
> *"...So shun the filth of idols, and shun lying speech"*[34]

Conclusion

In this paper I presented the current ethical principles embodied in the Helsinki Declaration and the guidelines established by CIOMS for the application of these principles. They are mostly in conformity with Islamic law. I did point out some of the differences. Some of these are outlined in the "International Ethical Guidelines for Biomedical Research (An Islamic Perspective)." Other differences represent my personal viewpoints.

It behooves Muslim researchers to fully abide by these principles and guidelines. Muslims who have *taqwā* (God consciousness) should be the first to promulgate those ideals as we are given the privilege by Allah (SWT) to care for His most honored creation, humans.

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Quality Assurance and Accreditation In Medical Education: An Islamic Perspective

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Abstract:

Quality control in higher education has become an essential part of the educational process at all levels. Most of the educational objectives can be quantified and standardized using quality assurance mechanisms. Market forces and globalization' are the reasons for the increasing emphasis on the concept of quality and its impact on the providers of education programs. There is increasing need to understand quality assurance and different modalities of quality control. In higher education, hybridization of two or three quality control models is required to address the most important issues of learning. Quality control demands the crisp application of tools which must assess and quantify all three basic domains of learning i.e. cognitive, psychomotor and effective domains. Based on these studies a quality management strategy is designed for every program. Based on quality management studies, a quality assurance process is designed which is a continuous process and is frequently modified according to the emerging situations. A quality culture needs to assure quality control mechanisms at all levels. It must address the requirements of infrastructure, services, human resources, selection of students, curriculum, instructional strategies, assessment system, research quality, graduates' as well as alumni's performance, student reporting system, academic counsel and faculty development. Benchmarks have become essential tools to improve the overall look of the institution. Islamic perspectives and concepts of excellence (*ihsan*) have been greatly emphasized in the Qur'an and the tradition (*Sunnah*) of Prophet Muhammad (PBUH). Work ethics, responsibility, accountability, sense of being answerable, not only in this life, but also in the hereafter and rewards of proper performance with utmost effort and best manners makes a believer strives for the best**.** Responsibilities need to be bestowed according to the best available abilities to achieve the best possible results. On the basis of Qur'anic teachings and the traditions of the Prophet (PBUH), certain criteria are deduced which every Muslim medical educationist must acquire to achieve and maintain the required quality assurance in medical education.

Keywords*: Quality control, quality assurance, medical education, accreditation, Ihsan, excellence, Islamic perspectives.*

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Introduction:

Quality is the means through which an institution can guarantee, with confidence and certainty that the standards of its educational objectives maintained and enhanced. Quality in higher education is a dynamic process which is the outcome of interaction of multiple factors that determine the state of equilibrium reached at various levels. These include, inter alia, leadership, quality of faculty, quality of students, infrastructure, facilities, research and learning environment, governance, strategic planning, assessment procedures, market forces and several other factors depending upon the type, nature and level of educational processes. [1]

How quality and standards are different?

Several keywords, often confused, require to be defined. Firstly, it is important to be clear that whereas 'quality' relates to process (for example, the quality of the educational process experienced by students), 'standards' refers to outcomes, or achievement. The link between them can be expressed in terms of the contribution of the educational process (or 'quality'), to the attainment of a defined standard of higher education. Secondly, in education, standards relate to three areas of activity: academic standards measure ability to meet a specified level of academic attainment; service standards assess service provided; while quality standards can be described as norms or expectations expressed in formal statements about desired practice, for example the ENQA Standards and Guidelines.[2]

Quality control in medical education and training comprises activities at different levels of the curriculum of medical schools, residency programs and postgraduate education. In Islamic theology quality arises from inner motivation and emanates from *ihsan* (excellence) which is the greatest achievement in Islamic work after Islam and *iman*. Quality culture is an indigenous product of Islamic civilization. Islam sets quality work and excellent performance in all spheres of life including education. Quality and its controlling mechanisms must permeate all activities. The Islamic concept of performance of a job is to achieve excellence. The Prophet said that Allah loves *ihsan* in everything and advised Muslims to perfect every work that they undertake.

In Western societies the concept of quality and Total Quality Management (TQM) was introduced in higher educational institutions not very long ago. However, it has rapidly permeated the thinking of many higher education managers during the past several years. It was basically introduced, developed and applied in the industrial environment where it not only gained high acceptance, but also has become a symbol of quality. Institutions have always held academic excellence and high quality as the

highest goals. Achieving these goals was easier in a time of abundant resources and favorable demographics. The environment has changed. Institutions are facing decreasing enrolments and revenues while costs and competition for students are increasing. Quality assurance and quality management have become an essential part of the managerial skills in higher education. Quality assurance and quality culture, though an old prerequisite for academic and business attraction, has generated immense interest recently with the increased competition in medical education and market requirements. At present, it is addressed in numerous academic and trade publications, by the media, and in training seminars. It is perhaps the most frequently repeated mantra among managers and executives in contemporary institutions of higher studies and excellence. The main idea of its application in medical education is persistence and continuous quality improvement, consistency of quality, staff (and student) participation, meeting customer needs, coordination, and management procedures which detect poor quality and stimulate good, all have a significant contribution to make to the development of efficient and effective mass higher education systems[3]. We must not forget that every effort to achieve the quality in Western systems was a market demand rather than inner motivation of believers as we see in Islamic way of life.

"Who has created death and life that He may test you which of you is best in deed And He is the All-Mighty, the Oft-Forgiving".[4]

The purpose of the creation of the human being is to achieve excellence in all his deeds irrespective of one's profession, status, education or any other gain. It is clearly stated in the Qur'an: *"Is there any reward for excellence other than excellence?"*[5] These and many other verses in the Qur'an clearly emphasize the quality concept and its mechanism in all fields including education.

Quality management in medical education

Quality control in medical education is a recently evolving concept, which underwent series of changes since its inception. A well-planned system of education aimed at achieving the goals and objectives set for it and a comprehensive quality infrastructure for the productive implementation and systematic evaluation of that system. Medical education has to be of the highest quality to produce graduates capable of delivering the highest quality of medical care by not only satisfying the consumers i.e. patients, their families, community and employers but even going beyond the expectations of everyone.

To achieve the set goals, several mechanisms of quality assurance were adopted such as Total Quality Management (TQM) or Total Quality Control (TQC) in industry and

business. None of these systems of quality assurance proved to be effective as a single entity. Total quality management (TQM) and its application in a health care institution has remarkably improved the standard of service provision and professional satisfaction. Quality assurance can be achieved through other models of quality care as well. There are sound reasons for being quality conscious in a medical organization and especially where teaching and training are also being provided to the health care workers.[6] There are several reasons for today's quality consciousness: ethical, economical, professional satisfaction, customer's need and others. Quality assurance should be an essential mechanism operating in any health care facility.

However, TQM model alone has certain inherent difficulties in its applications in academic institutions. Many questions of academic interest can not be answered in the TQM model. Experts have proposed other models in addition to TQM to address the unanswered questions of quality assurance in academic institutions:

Harvey and Knight (1996) presented **'transformation model' Engagement Model of Program Quality'.**[7] These programs invest in five separate clusters of program attributes, each of which contributes to enriching the learning experiences for students. These includes: Diverse and Engaged Participant, Participatory Culture, Interactive Teaching and Learning, Connected Program Requirement and Adequate Resources. This theory advances a new perspective on program quality management, support for students, faculty and basic infrastructure. In broad terms, the engagement theory emphasizes student learning as the primary purpose of higher education.

In 1998, Bowden and Marton proposed the **University of Learning Model[8],** and postulated that in all the commonly perceived functions of a university: teaching, research or community involvement, the core process is one of *learning***,** arguing that 'quality in a university context has a lot to do with the quality of learning and the quality of learning has a lot to do with qualities of different ways of seeing when the learner widens the range of possibilities of seeing the same thing.

The University of learning model is more appropriate because:

1. Teaching, research, and service are distinguished only by the duration and level at which learning takes place: teaching serves to facilitate learning at the level of the individual student; service involves learning at the local level; and research contributes to knowledge formation on a society-wide basis.

2. For students to be able to cope with the unknown future on graduation, the curriculum

would need to be designed so that students experience variation and develop the capabilities to look at the situation, discern the relevant aspects, and address them simultaneously

3. It follows that assessment methods, in turn, should contribute to and reflect learning objectives. Assessment tools should be able to identify students who demonstrate mastery over the concepts and skills the course seeks to promote. Assessment should measure not only what students have learned but also the quality of their 'learning' since this, they argue, is the most reliable measure of their future effectiveness. The shift from an input-oriented educational approach to a learning-focused approach requires not only that academics develop new approaches and skills but also requires universities to reorganize themselves.[9]

In 1998 Tierney proposed the **Model for a Responsive University[10]:** This model is based on the premise that the public will judge the university in terms of the quality of their relationships and the quality of the outcomes. The university should be more responsible in communications and response, service oriented and meeting the needs of their communities. Every effort is diverted to student requirements and demand matching the mission statement of the institution.

Proposed strategy for Quality Management in Our institutions:

In light of understanding of different models of quality control in a medical institution, we propose that a hybrid model of quality control will be suitable for our institutions. For service departments like transport, residences, patient care and other hospital services TQM will be suitable to maintain and assesses the quality. To make the process more comprehensive and practical we need to apply "university of learning model" which addresses the quality issues in the learning environment, in research and developing skills in the students. It also assesses the quality of the academic staff work and academic process as a whole. Quality control should be a continuous process and many more models may be developed and proposed. Quality control process should not be cumbersome, difficult, and stringent or skeptic in nature. Instead, it should be user friendly and encouraging. Continuous research and development on regular basis in quality control mechanisms will make the quality management tools acceptable across the board.[8]

Proposed models of quality management in teaching and learning:

Another aspect of quality medical education is that learning must be holistic, comprehensive and balanced. In other words medical education must include the cognitive, psychomotor and affective domains of knowledge. If

we combine the two systems of quality control namely **TQM and University of Learning Models**, the quality in almost all domains can be assured. But still there are several areas in higher education where we need to devise more comprehensive mechanisms of quality control. Other models which are still in use are ***Transformative Model*** clearly focusing on total student experience. Another model is based on the premise that learning is a *dialogue* between participants and providers. *Dialogue* involves the discussions between learners and teachers about the nature, scope and style of their learning. *Dialogue* also requires a dynamic exchange among the teachers about the teaching and learning process.

In 1997 Haworth and Conrad proposed the ***Engagement Model of Program Quality***[11]**:** which is organized around the principal stakeholders – academics, students and administrators engaged in teaching and learning. Based upon an extensive interview of persons involved in higher education, the authors define 'high quality programs as those which contribute to the learning, that provide experiences for students and have positive effects on their growth and development. Five clusters of programs are evolved, each of which contributes towards enriching the learning experiences for students.

1. ***Diverse and Engaged Participants:*** faculty (academics), students and leaders.
2. ***Participatory cultures:*** Shared program direction, Community of learners, and risk taking environments.
3. ***Interactive Teaching and learning:*** Critical dialogue, Integrative Learning, Mentoring, Cooperative Peer learning, and Out of Class activities.
4. ***Connected Program Requirements:*** Planned Breadth and Depth of Coursework, Professional Residency, and Tangible Product.
5. ***Adequate Resources:*** Support for students, faculty and basic Infrastructure.

In broad terms, the engagement theory advances a new perspective on program quality management that emphasizes student learning as the primary purpose of higher education and highlights the pivotal role that people – primarily the academicians, administrators and students – play, and provides a template for assessing quality.[12]

In 1988 the World Federation of Medical Education held a conference at Edinburgh and laid down an organizational structure at six regions linked with WHO, UNICEF, UNESCO, UNDP and WORLD BANK to support and sustain quality medical education. In its first policy statement, called the Edinburgh Declaration, it laid down twelve principles for reforming medical education. Those principles are:

1) Relevant educational settings.
2) A curriculum based on national health needs.

3) Emphasis on disease prevention and health promotion.
4) Life long active learning.
5) Competency based learning.
6) Teacher's training as educators.
7) Integration of science with clinical practice.
8) Selection of entrants for non-cognitive as well as intellectual attributes.
9) Co-ordination of medical education with health care system.
10) Balance production of doctors.
11) Multi-professional training and
12) Continuing medical education

WHO proposed to medical colleges the world over to produce doctors, who can: "assess and improve the quality of health care, make optimal use of new technologies, promote healthy lifestyles, reconcile individual and community health requirements and work efficiently in teams".

It is therefore crucial to develop a model of quality management in all institutions and make them the centers of excellence in their respective specialties.

Quality Assurance Process

Quality management is the responsibility of the top management. The top management should lead by example. In order to achieve the above, in addition to patience, participatory management among well-trained and educated partners is crucial to the success of TQM and University of Learning model in education; everyone involved must understand and believe in principles. Personnel who are committed to the principles can facilitate success with this strategy. Their vision and skills in leadership, management, interpersonal communication, problem solving and creative cooperation are important qualities for successful implementation of this set of strategy.[13]

Continuous progress and ongoing process of Quality Management

The work done within the organization must be seen as an ongoing process. Quality speaks to working on the system, which must be examined to identify and eliminate the flawed processes that allow its participants to fail. Since systems are made up of processes, the improvements made in the quality of those processes largely determine the quality of the resulting product. Continuous research, evaluation audit and audit of audit will make the quality assurance system more competent and more reliable.

Quality Assurance and Quality Culture in Medical Education

Medical education has become a more global phenomenon than merely an educational process. The competitors are global and are no longer confined within national boundaries. Winners of the competition are those with the highest quality in terms of products and services. Quality assurance programs have been set up by the states and medical professional bodies.

Accreditation and recognition of degree programs depends upon quality culture in the respective university at all levels and is being monitored by the respective bodies. Since, in the globalized economy, people seek work outside their country of birth, hence it is very important to ensure that medical qualifications of the mother country are accepted worldwide[14]. This acceptance will occur only if the highest international standards of quality are maintained. Cooperation among various universities and faculties at national and international levels are now coming up with formulation of unified quality assurance guidelines and criteria. These criteria also provide a framework for benchmarking. The practical process of quality assurance includes setting up a quality assurance system, as well as implementation and evaluation of this system. At every level quality assurance process is to be set up meeting specific criteria[15].

Human resources

Teaching facility and academic staff must be appropriately qualified, trained and experienced. Appointment and promotion of academic staff should depend only on academic merit, suitability and character. Good staff means high quality. The minimum qualification for basic medical science lecturers is a doctoral degree. Clinical teachers must have the professional specialist qualification for their respective fields. All academic staff must undergo training workshops and courses on pedagogical strategies and teaching methodology including writing course descriptions, learning objectives, lesson planning, effective use of audio-visual aids, and assessment systems. The teacher to student ratio could vary by department and nature of discipline but must be fixed and documented in the QA manual. The university must have personnel policies that motivate the academic staff to produce their best. Financial and administrative procedures must be clearly spelled out in a staff handbook. Faculty members must be aware of the disciplinary measures to be taken in case of violation of any rules and regulations. It should be mandatory for all teachers to upgrade their knowledge, skills and training by participating in conferences and special training workshops, courses or seminars[16]. In this coyest, it has been stated:"Anyone who stops learning is old, whether at twenty or eighty" "Be a student so long as you still have something to learn, and this will mean all your life". **A Muslim Educationist** is a life long learner and continuously improves his knowledge and skills. This is considered continuous performance of righteous deeds: Allah's Messenger (PBUH) said: "The best loved deeds to Allah are the ones that are continuous even if they are not very many."[17]
The best of deeds are the most consistent of them."[18]

Pedagogical tools and curricula:

Well-documented and holistic

curricula that must reflect a stated underlying vision and mission of the faculty is required. All basic domains of education including knowledge, skills, and attitudes should be adequately covered in these medical curricula with full integration both vertically and horizontally. They should be benchmarked against the best faculties of medicine in the region and internationally. They should also be accredited by the national medical licensing and regulatory authority to make sure that graduates will be registrable and employable in the local hospitals. Quality in medical education also implies the recognition of the final qualification by other universities especially overseas. However, denial of recognition does not always indicate poor quality because political factors might be responsible for such rejections.

The exponential growth in medical knowledge and continuous research in medical education requires continuous revision of the teaching strategies and curricula. These reviews should result in refining, redirecting, and restructuring the curriculum. The process of curriculum review should be evolutionary and not revolutionary. Abrupt changes and redoing every thing might raise serious issues in the learning and educational process. Therefore such actions should be gradual and well consulted[19].

All learning resources must be adequate, fully supported by the required literature and audio visual aids. Quality starts from the facilities, infrastructure and management. If those are done well only visionary and qualified teachers are needed to ensure quality products. Library books, digital libraries, learning resource centers and internet access are essential prerequisites for achieving quality education[11].

The evaluation system of students reflects its quality management and control. Commencing from the enrollment of the students during the course and exit assessments, both summative and continuous, reflect the preparation of the students and quality of the end product. A systematic assessment scheduled accordingly and well designed standing procedures of assessments and exams are essential to maintain quality of medical education. All faculty members must have written policies and guidelines for examinations and assessment process. Baseline criteria for assessment of students including all three essential domains of learning: (cognitive, effective and psychomotor domains), passing score as well as transparency in the assessment system are hallmarks of quality assessment.

Internal and external examiners are appointed to achieve the required standard of evaluation. To maintain quality, medical educators faculty from other institutions should be involved as external examiners. Their involvement should include comments on the examination system; questions as well

as marking a sample of the answer sheets to make sure those internal marking standards are comparable to external ones and meeting the requirements nationally and internationally.

Evaluation of the system

Admitting good students means high quality. Only the best should be admitted. Besides the academic grades, consideration should be given to character and motivation to study medicine. Experience has shown that diversity improves quality. Student counseling services should be provided for all students. There must exist mechanisms for identifying and counseling failing students as early as possible[20].

Students are the most important stakeholders in the educational process. Therefore their satisfaction is very important. We have to listen to them and address their concerns. We can get student feedback from the examinations. This feedback is collected through use of questionnaires. These questionnaires are more effective if administered regularly usually at the end of each unit or module. Students should be asked to indicate their degree of satisfaction with each individual learning objective. If there are too many objectives we may group them into natural categories and select a few objectives from each category for inclusion in the questionnaire. Along the formal feedback there should be an informal mechanism of feedback from the students and faculty reflecting upon the process of learning as a whole as well as on individual sectors of learning and education. It is always more realistic to get feedback from the students, faculty members and other stakeholders during informal meetings.

Quality control in research at all levels

The quality culture can never be embedded in teaching and learning until it is fully supported and enhanced by continuous research and innovation process in the university or faculty. The university must allocate funds for research. The research budget should not be less than one percent of the university operational budget. Academic staff must be given incentives for good research. They must be given time for research. This requires careful balancing of teaching and research which may be difficult when there is a shortage of teaching staff. Research committees must exist at the university and faculty levels. The research protocols, strategies and outcomes should be closely monitored and linked with the postgraduate strategy because academic staff undertakes research by directing and supervising postgraduate students. It is research which measures the standard of any faculty or university. It also enhances the academic standards by making the medical teachers as creators of knowledge instead of being only consumers of knowledge who just pass it on to the students. The researcher always keeps maintaining a cutting

edge knowledge in his specialty. Quality research addressing the requirements of society should be based on a strategic plan detailing what is to be achieved within the next 2, 5, or 10 or 20 years. The research should be attractive and of great interest and value. Even though it may be simple but, if it is focused and well designed, it can still yield useful results. Outcome of research must be monitored by committees of peers and research output shall be judged for each individual faculty member as well as for the faculty as a whole. The faculty should have a well represented and empowered research ethics committee. Research publications must be periodically evaluated and those having good impact on teaching and learning, as well as patient care, must be rewarded by all possible means. Faculty members should be asked to present their research findings at all possible levels both nationally and internationally.

In the Islamic reference, research is an integral part of life of every Muslim, irrespective of his/ her profession or job: *"Verily! In the creation of the heavens and the earth, and in the alternation of night and day, there are indeed signs for men of understanding. Those who remember Allah (always, and in prayers) standing, sitting, and lying down on their sides, and think deeply about the creation of the heavens and the earth, (saying): "Our Lord! You have not created (all) this without purpose, glory to You! (Exalted are You above all that they associate with You as partners). Give us salvation from the torment of the Fire* [26]. In other verses it has been emphasized why it is essential for Muslim scholars to indulge into research. Those who are knowledgeable and those who do not acquire knowledge are never equal according to Qur'an. *"If you don't know ask those who know"* [27]. *"For every news there is a reality and you will come to know"* [28]

Graduate- Alumni follow up

The most important indicator of the quality of a medical educational system is the product (graduates). After graduation they take knowledge and skills learned to the outside world. Their job performance and character reflects, to a maximum extent, the quality of education they received. Thus a faculty of medicine should follow up and trace its graduates to find out their performance in practical life. This tracing and evaluation can be done through designed questionnaires or through electronic communication and even via telephone.

Students and staff exchange programs

Exchange of faculty among like-minded faculties, regionally and globally, for short periods as well as for electives of students and refresher courses for teachers, will also maintain the quality in a teaching facility. The students can join classes in other faculties and the lecturers can give lectures in other faculties. In the process they get to draw comparisons with other faculties. They

may learn new strategies and methods that can be instrumental in improving their faculty[10,22-25,29].

Annual reports of staff and students

Academic staff should have annual performance appraisals of their work. Any deficiencies detected should then be rectified. Those contributing more in nurturing quality culture must be appropriately rewarded. Students' annual reports must come from their mentors on a regular basis. A yearly report with critical analysis presented and discussed in a faculty board meeting will lead to improved quality of knowledge, skills and attitudes of the students[22].

Academic council and faculty board

Regular meetings of faculty boards and academic councils with critical review of the educational reports of ongoing academic activities, reviewing examination questions, and reviewing minutes of monthly departmental meetings and academic performance, including research done in a particular faculty, is an important tool to assure quality.

Benchmarking

The curricula should not be designed and progressed in isolation. Rather the curricula in the faculty should be compared with curricula in other faculties. This process has now become easier because many universities put their curricula on their websites. The purpose of benchmarking is not to copy other's performance. It serves the purpose of indicating whether, in general, we are 'moving with the crowd'. If a curriculum differs in major ways from comparable institutions, a rational explanation must be found. Other approaches to benchmarking could be achieved by registering students to take international medical examinations. In USA there is MCAT and USMLE examinations. The MCAT examination is taken by pre-medical students. The USMLE I examination is taken by students who have completed the medical sciences curriculum. The USMLE II is taken at the end of clinical training. GMC of UK has designed their own system of evaluation of quality products. The same is done by other countries to assure quality in their respective environments. Many countries now stress on adequate linguistic proficiency which is used as the medium of educational process[23].

English has become an international language of scientific and professional communication. Internet information is predominantly in English. Therefore quality teaching and quality learning require mastery of the English language. Special courses of English proficiency should be conducted for students and academic staff whenever it is required in the faculty or institution[24, 29].

Quality Assurance is an Islamic concept

***Ihsan* (Excellence) in the Qur'an**

Fourteen centuries ago, Islam enjoined

perfection in all domains of human endeavors. The Prophet (PBUH) laid the foundation for quality assurance when he said:"Verily, Allah loves that whenever any one of you performs any kind of work, he should perfect it" [30].

The Qur'an and *Sunnah*, describe a concept which is pivotal in the work culture and ethics of any individual, organization, society and nation, this is the concept of *Ihsan*. Ihsan is a supreme and superlative concept of excellence based on purity of intent, sincerity, righteousness and true love and obedience to the Creator, in pursuit of His pleasure in every sphere of life, including seeking the best interests of His creation.

The Qur'an describes this quality as the basic reason for the creation of human beings and the blessings of divine rewards for the pursuit of excellent deeds: *"Who has created death and life that He may test who of you is the best in deeds"*[31].

"Is there any reward for ihsan (excellence) other than ihsan"[32].

Based on these noble and pristine values, a Muslim educationist strives diligently to acquire the best possible abilities and capabilities to train and educate new generations of professionals who will continue to maintain and perpetuate the highest moral values and quality of human care. and they would undertake this task with utmost sincerity, genuine interest and unparalleled zeal guided by the benchmark ethics and gold standards of human behavior.

Islam enjoins and sets rewards for pursuit of knowledge: *"Allah will exalt in degree those of you who believe, and those who have been granted knowledge"*[33].

"Allah makes the way to Jannah (Paradise) easy to him who treads the path in search of knowledge"[34].

A very high sense of responsibility and accountability is a moral value that Islamic teachings imbues in the hearts and minds of Muslims. There is no better quality control mechanism compared to Qur'anic and Prophetic guidance which inspires the best forms of behavior in the believers, giving the most comprehensive and perfect model of quality assurance of the highest forms:

"And pursue not that of which thouhast no knowledge, for every act of hearing or of seeing or of (feeling in) the heart will be enquired into (on the Day of Reckoning"[35].

"Then shall anyone who has done an atom's weight of good, see it! And anyone who has done an atom's weight of evil, shall see it"[36].

Thus, a Qur'anic model of quality assurance in learning and education provides the most efficient and ideal mechanism of quality control at all levels and every step of the educational process. Not only it controls the phenotypic quality assurance, but every follower of this system has the genotype correction as well, which is a deep stimulant to remain upright and truthful in every walk of life[1].

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k. In press:

Example: Tian D, Araki H, Stahl E, Bergelson J, Kreitman M. Signature of balancing selection in Arabidopsis. Proc Natl Acad Sci U S A. In press 2002.

l. Homepage/website:

Example: Cancer-Pain.org [homepage on the Internet]. New York: Association of Cancer Online Resources, Inc.; c2000-01 [updated 2002 May 16; cited 2002 Jul 9]. Available from: http://www.cancer-pain.org/.

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