

Special Communication

Towards behavioural sciences in undergraduate training: A core curriculum

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Abstract

There is strong evidence to link biological, behavioural, psychological, and social variables to health, illness and disease. But this knowledge has not been successfully incorporated into standard medical practice. There is a general accord that a simple disease-based model of clinical practice is inadequate and that there is need to change the approach of doctors to include a better understanding of behavioural issues. The need to integrate Behavioural Sciences as an integral component of medical training is well recognised. PMDC initiated these efforts in 2005 but since then little progress has been made towards developing a core curriculum. This aim of the present article is to initiate a concerted effort towards this direction in Pakistan. We have outlined specific objectives keeping the recommended domains for BS in mind. In addition, knowledge and skills-based learning outcomes have also been defined.

Keywords: Medical Ethics, Psychosocial, Human development, Mental health, Communication.

Introduction

"In almost all countries, the education of health professionals has failed to overcome dysfunctional and inequitable health systems because of curricular rigidities, professional silos, static pedagogy (ie the science of teaching), insufficient adaptation to local contexts, and commercialism in the professions. Breakdown is especially noteworthy within primary care, in both poor and rich countries."¹ In a similar vein, the US Institute of Medicine (IOM) reported that "although the scientific evidence linking biological, behavioural, psychological, and social variables to health, illness, and disease is impressive, the translation and incorporation of this knowledge into standard medical practice appears to have been less than successful."²

The bio-psycho-social model³ provided a paradigm shift in medical practice. It is well recognised that Behavioural Sciences (BS) should become an integral component of medical training.⁴ Indeed, the PMDC (2005) has also accepted the need to incorporate such training in medical education.⁵ However, a recent review found that little progress has been

made in improving the quality and quantity of behavioural sciences' teaching in medical schools, even in developed countries.⁶ Their findings suggest that there are no uniform guidelines, well established curricula, training modules or materials. They also highlighted a severe shortage of adequately trained teachers. Some of these issues have been addressed in a recent textbook by Humayun & Herbert⁷ which focused on training and learning in BS in a Pakistani context.

This aim of the present article is to initiate a concerted effort to develop a standardised curriculum for BS in Pakistan. There is an urgent need to define an essential core to meet the general objective of undergraduate curriculum.⁵ The IOM recommended six topic domains for the behavioural sciences in medical education:²

1. **Mind-body interactions:** To learn about the interaction between biological, behavioural, psychological and social factors which contribute to health issues.
2. **Patient behaviour:** To understand behaviours that put patients at risk and help them develop interventions for behaviour change.
3. **Physician role and behaviour:** To highlight how the doctor's personal background, beliefs and attitude influences patient care.
4. **Physician-patient interaction:** To learn effective communication with patients and their families.
5. **Social and cultural issues in health care:** To provide appropriate care to patients with differing social, cultural, and economic backgrounds.
6. **Health policy and economics:** To help students understand their health-care system.

Published literature on the role of BS in medical training is scanty and largely from developed countries. In the UK the General Medical Council (2009) set out specific objectives for BS in undergraduate training.⁵ This has been modified as follows:

Apply psychological principles and knowledge to medical practice:

1. Explain normal human behaviour at an individual level.
2. Apply psychological concepts to explain the varied responses of individuals to disease.
3. Explain psychological factors that contribute to illness, the course of the disease and the success of treatment.
4. Discuss psychological aspects of behavioural change and treatment compliance.
5. Discuss adaptation to major life changes, such as bereavement.
6. Identify appropriate strategies for managing patients with

emotional difficulties.

Apply social science principles and knowledge to medical practice:

1. Explain normal human behaviour at a societal level.
2. Discuss sociological concepts of health, illness and disease.
3. Explain sociological factors that contribute to illness, the course of the disease and the success of treatment.
4. Discuss sociological aspects of behavioural change and treatment compliance.
5. Explore issues relating to health inequalities, the links between socio-economic factors and health.

Communicate effectively with patients and colleagues:

1. Communicate clearly, sensitively and effectively with patients, their families, and colleagues.
2. Communicate clearly, sensitively and effectively with individuals regardless of their age, socio-cultural backgrounds or their disabilities.
3. Apply the principles of non-verbal communication in the medical consultation.
4. Communicate appropriately in difficult circumstances, such as when breaking bad news, and when discussing sensitive issues, such as sexual practices, smoking or obesity.
5. Deal effectively with emotional reactions of patients.
6. Apply the techniques of counselling in everyday medical practice.

Apply ethical principles to medical practice:

1. Discuss and apply the principles of medical ethics with special emphasis on cultural issues.
2. Explain the code of ethics set by the PMDC.
3. Demonstrate awareness of the clinical, administrative and social responsibilities of the doctor.
4. Respect all patients regardless of their age, gender, lifestyle, beliefs, religion, culture, disability, ethnicity or socio-economic status. Graduates will respect patients' right to hold religious or other beliefs, and take these into account when relevant to treatment options.
5. Recognise and respect the rights of patients and colleagues.
6. Understand ethical responsibilities involved in protecting and promoting the health of individual patients and community including vulnerable groups.

The authors suggest at least 6 modules to meet the objectives above. A brief introduction and rationale for

individual module is included below. We have identified key themes and topics for each module. In addition, knowledge and skills-based learning outcomes have also been defined. We have not made any comments on teaching methodology because we are well aware of the diverse variation of resources in different medical institutions but we have made an active effort to maintain a patient-centred approach throughout this curriculum.

1. Communication skills
2. Human development
3. Social influences in health care
4. Psycho-social aspects of physical illness
5. Medical ethics

6. Mental health care

1. Communication skills:

Since communication plays a central role in medical practice, formal training in such skills is strongly recommended as an integral part of the medical curriculum.^{5,9} A widely used model of medical consultation suggests that essential components for effective communication involve the skills of developing a relationship, collecting information and giving information.¹⁰ Then there are more complex communication tasks e.g., breaking bad news. The need for formal training to do so is well established.¹¹ To foster a holistic approach towards their patients, doctors should be able to deal with emotional reactions of patients. To do this, simple forms of

Table-1: Communication Skills.

Module-1: Communication Skills		
Themes/topics	Learning outcome - Knowledge	Learning outcome - Skills
1 Introduction to communication	Discuss why communication has a central role in medical practice Describe the three function model of medical consultation	
2 Building a relationship	Describe the essential components of building relationships with patients Discuss boundaries of a doctor- patient relationship Discuss the role of families and the need to engage them	Conduct an interview and build a relationship: Start and conclude an interview effectively Form rapport Develop empathy Enhance communication non- verbally Respect personal space
3 Collecting information	Demonstrate knowledge of different techniques to collect accurate and relevant information Discuss a 'patient-centred consultation'	Listen actively Use appropriate language effectively Ask questions using appropriate balance between open and closed questions Observe carefully and pick cues from non verbal behaviour Elicit a patient's explanatory model
4 Providing information	Discuss the need for providing information appropriately	Share necessary information effectively Make a plan in partnership with the patient
5 Breaking bad news	Define bad news Describe the need to discuss such news with patients and families Discuss different schools of thought about disclosing unfavourable information and their limitations Discuss the role of cultural aspects in application of western models especially in relation to the requests of families to withhold information from the patient	Prepare to deal with a difficult situation Conduct a safe and effective interview Determine what and how much information to give Recognise and deal with patient's emotions Plan follow up
6 Counselling	Define counselling and its role in medical practice Discuss various counselling skills Outline the steps of the counselling process	Overcome hesitation to work psychologically with the patient Demonstrates basic techniques of counselling
7 Other Psychological interventions	Describe common emotional reactions encountered in medical practice Discuss the links between physical symptoms and psychosocial factors Describes the principles underlying Cognitive Behaviour Therapy (CBT) Discuss indications for CBT	Deal with angry patients and their families Support depressed/crying patients Outline steps of 'Reattribution technique'

essential psychological interventions (counselling techniques) and other common intervention (Reattribution Technique, introduction to Cognitive-Behaviour Therapy etc) should also be incorporated.

2. Human development:

The role of the basic domains of psychology (e.g.

development, cognition, learning) for teaching BS is well established.¹² These are essential to describe the mechanisms by which behavioural and social processes interact with biological functions in health. It, therefore, provides the scientific framework for an integrated bio-psycho-social curriculum. Chur-Hansen, et al,¹³ studied the challenges for BS teaching and concluded that there is 'domination of the

Table 2: Human Development:

Module 2: Human Development		
Themes/topics	Learning outcome - Knowledge	Learning outcome - Skills
1 Child development	Outline the evidence for perceptual preferences in the new born infant Explain how the neonate can communicate Accurately summarise Piaget's stages of cognitive development Recognise early differences in temperament Describe the basis of attachment theory Define the terms 'puberty' and 'adolescence'	Test rudimentary perceptual abilities in the neonate Explain to parents what the newborn can and cannot do Make a basic assessment of the child's level of cognitive development and determine whether this is delayed, normal or advanced Take appropriate actions to prepare a child for medical procedures including hospitalisation
2 Puberty & adolescence	Outline gender differences in the growth spurt Describe the importance of body image in psychological development Explain how people develop their sexual identity and sexual preferences Describe how social identity and autonomy develop and how they might be affected by cultural differences	Explain the psychological effects of the physical changes in males and females Deal with common misconceptions about masturbation Explain to parents about the need to foster autonomy Explore what adolescent patients know about maintaining sexual health Effectively communicate with adolescent patients
3 Ageing	Explain the consequences of adopting a purely biological definition of ageing as opposed to one based on the biopsychosocial approach Outline role changes in the ageing process Summarise biological changes in ageing and their consequences Explain psychological changes in ageing	Explore family relationships in elderly patients Demonstrate the role of the doctor in providing adequate health care facilities for the elderly Effectively communicate with a hearing-impaired patient Counteract ageist statements and attitudes
4 Learning & behaviour change	Explain what is meant by 'learning' Explain the theoretical basis of: a. Classical Conditioning b. Operant Conditioning c. Observational Learning Give examples of Conditioning principles in medical practice	Explain in lay terms the principles of learning Consider incorporating learning principles when devising a treatment plan Involve the patient's carers when planning behaviour changes Include learning principles when planning invasive medical procedures
5 Emotion	Outline the James-Lange theory Summarise the Canon-Bard approach Discuss the functions of emotions Differentiate between primary and secondary emotions Describe how emotions might be regulated Discuss the role of positive emotions on health Outline how culture affects the expression of emotions Recognise the role of expressed emotions in mental health care	Explore the patient's emotional state Explain in simple terms the link between emotions and bodily functioning Encourage positive emotions when possible Involve the family, with explanations, in the management of some mental health problems
6 Memory	Outline the structure of memory Discuss the nature of (a) short-term memory and (b) long-term memory Explain why there is a distinction between STM and LTM Describe techniques to improve memory	Be able to help patients recall more of long and complex explanations by using appropriate techniques Demonstrate an awareness that history-taking is open to memory bias by the patient
7 Intelligence	Discuss the development of intelligence testing Describe how the Intelligence Quotient (IQ) is derived Outline how biological and socio-environmental factors affect intelligence Summarise the notion of 'successful intelligence' Define the term 'personality'	Able to understand and empathise with memory problems caused by medical conditions Detect special needs in children List medical conditions which affect intelligence Refer patients appropriately for specialised intelligence testing
8 Personality development	Outline the Psychoanalytic theory of personality Discuss the trait approach to personality Describe the five-factor model Describe the concept of 'locus of control' and how it might affect patient behaviour	Explain the association between Type A and Type B personality and illness Link personality variables to patients behaviour in a medical setting

biomedical model without a corresponding recognition of psychology as science' around the world. We, too, need to recognise the potential contributions of psychologists as health care professionals and work towards developing a multi-disciplinary faculty for teaching BS.

3. Social Influences in Health Care:

The WHO definition of health clearly defines that a complete state of health cannot be achieved without 'social

competency-based goals for local effectiveness rather than to adopt models from other contexts that might not be relevant'.¹

4. Psycho-Social Aspects of Physical Illness:

PMDC recognises the need for an integrated curriculum so that knowledge of different sciences can be applied in a systematic manner to formulate/manage or develop individual cases. Clinical applications must

Table 3: Social influences in health care.

Module 3: Social Influences In Health Care			
Themes/topics	Learning outcome - Knowledge	Learning outcome - Skills	
1	Becoming ill and seeking help	Demonstrate how social and demographic factors influence people to seek help or to avoid doing so Describe psychological factors that affect help-seeking behaviour Outline the variables in the Health Belief Model Discuss the options available to patients wanting help Define common sources of complementary medicine	Explore about other sources of help the patient has used Explain some risks of using complementary medicines Inquire about the process of deciding to seek help from a doctor
2	Stress	Discuss stress as being caused by external demands Outline the bodily responses to stress and the General Adaptation Syndrome Discuss the transactional approach to stress Enumerate, with examples, the psychological defences used in stress Explain the influence of stress on the immune system	Convey, in simple terms, how stress affects bodily functioning Apply stress management techniques Be aware of stressors in the medical profession
3	Lay beliefs and cultural factors in health and illness	Explain how lay beliefs develop Give examples of some common lay beliefs about illness and its treatment Appreciate the hot-cold theory of disease and its treatment Give examples of how commonly used words might be interpreted differently by patients Outline the important areas of the patients explanatory model	Elicit patient's ideas about their illness and treatment Correct gently misconceptions Avoid jargon when giving advice Cover all areas of the explanatory model during the consultation
4	Following doctors' orders	Explain what is meant by treatment adherence Discuss the extent of noncompliance in patients, especially in Pakistan Appreciate the needs of patients coming to a consultation List the ways we can enhance compliance	Explore what the patients wants to know and address the issues Inquire about suspected noncompliance in a non-confrontational manner Demonstrate the use of techniques to enhance compliance
5	Reactions to illness	Outline the factors which result in illness behaviour Discuss the rights and obligations of the Sick Role Give examples of emotion-focussed and problem-focussed coping with illness Define, with examples, the concept of Stigma	Able to explore the family's role in illness behaviour Deal empathetically with the patient's attempts to cope Understand the role that stigma plays in the patient's reactions to illness Be able to control one's own negative stereotypes
6	The family	Describe the different forms of family structure Discuss the functions of the Family List how the Family affects health Describe how illness affects the family	Communicate and work with families Ask about family life and how other members of the patient's family are coping with the illness
7	Inequalities in health and health care	Discuss how social class can be defined. Appreciate the link between social class and health Describe possible causes of the class-health link Discuss the extent of gender inequalities in health and health care Describe the inequalities in providing mental health care	Demonstrate a willingness to act as an advocate for the patient to rectify causes of inequalities

well being'.¹⁴ This adds huge responsibility for medical trainers to prepare doctors competent to recognise and deal with social influences of healthcare. The Lancet Commission (2010) notes that, 'In view of the huge diversity of health systems, the challenge is to adapt

consider both the diseases of organs (parts of the body) and processes (functions of systems) in a synergistic fashion.¹⁵ Psychological processes and social influences affect physical health. They do this via bodily systems, such as the neuroendocrine and immune systems or via

Table 4: Psycho-social aspects of physical illness.

Module 4: Psycho-Social Aspects Of Physical Illness		
Themes/topics	Learning outcome - Knowledge	Learning outcome - Skills
1 Behavioural influences on physical health	Describe health - related behaviours Discuss eating behaviour and its implications in healthcare Apply the principles of learning to explain how addictive behaviour develops Explain the transtheoretical model for changing behaviour	Review health belief model and apply it to explain health related behaviours Outline a management plan to help a patient lose weight Outline a management plan to help a patient stop smoking Outline the steps for enhancing motivation in a patient
2 Psychosocial aspects of coronary heart disease (CHD)	Discuss various psychosocial factors that contribute to causing CHD Describe the psychosocial consequences of suffering from a heart disease Describe the effect of heart disease on families Outline psychosocial interventions for CHD	Convey, in simple language, how lifestyle might contribute towards heart disease Explore emotional reactions in a patient with recent heart disease Support the family of a patient with recent heart disease
3 Understanding 'medically unexplained symptoms' (MUS)	Discuss the epidemiology of MUS in our cultural context Relate it to illness beliefs and associated perceptions Outline a treatment plan	Explain nature of MUS to patients Help limit further investigations
4 Introduction to palliative care	Discuss psychological consequences of facing a terminal illness Discuss communication challenges for doctors Discuss spiritual and ethical aspects of palliative care	Plan culturally effective care Communicate effectively with families Support carers Ensure own well-being
5 Sexual difficulties and medical practice	Discuss common sexual dysfunctions and their prevalence with emphasis on culture bound syndromes Discuss barriers to seek help Discuss psychosocial factors associated with Infertility	Overcome own embarrassment Not make the patient uncomfortable Take a psycho-sexual history
6 Trauma, Injury and Violence	Discuss the role of psychosocial factors associated with road traffic accidents Discuss the prevalence and causes of domestic violence Discuss the extent and consequences of torture Discuss the prevalence, nature and causes of self harm	Plan psychosocial care to those exposed to trauma/accidents Explore the possibility of domestic violence in vulnerable patients Assume responsibility to help victims Take relevant history of an episode of self harm Refers for appropriate medical or surgical care Refers for psychiatric assessment
7 Pain	Discuss psychological reactions to chronic pain Discuss factors affecting perception of pain Describe the Gate-Control Theory (GCT) of pain	Refers for psychiatric assessment Outline a broad and holistic treatment plan

health behaviour. The WHO pointed out that smoking, an unhealthy diet and physical inactivity are the modifiable risk factors for the huge burden of non communicable diseases in south Asia.¹⁶ Therefore, training in strategies to modify behaviour is essential. Many physical disorders are caused by or made worse by psychological factors. It is also strongly recommended that particularly in the realm of cardiovascular medicine.¹⁷ Common or 'difficult to manage' psychophysiological disorders should be included in the curriculum e.g., 'medically unexplained symptoms'. In addition, the role of psychosocial aspects of e.g., palliative care, trauma and violence, self harm and psychosexual disorders cannot be ignored.

5. Medical Ethics:

The role of medical ethics in undergraduate education is well recognised.^{9,18} Despite that, it is worrying that knowledge of medical ethics and its

application in clinical work has been reported to be poor in our setting.^{19,20} Medical ethics, which deals with how we should or should not interact with patients and colleagues, lies at the heart of daily clinical practice. If doctors are not taught to think about their ethical responsibilities, then there is little to curb an assumed right to do whatever they want. This module attempts to redress that educational imbalance. Students must understand the basic principles governing ethical aspects of clinical practice, their application and limitations. In our view, duties and responsibilities of medical students and doctors need to be addressed in the curriculum. That includes clinical, administrative and social responsibilities. Issues related to research, financial matters and dealing with pharmaceutical industry should also be emphasised. Ethical conflicts that are of growing concern to our healthcare must be included. One such area is that of illegal kidney trade which is grossly exploiting

Table 5: Medical ethics.

Module 5: Medical Ethics		
Themes/topics	Learning outcome - Knowledge	Learning outcome - Skills
1 Introduction to medical ethics	Discuss the role of medical ethics in healthcare and the difficulties in application of medical ethics Discuss the relevance of medical ethics to students	Debate ethical dilemmas relevant to undergraduate medical training Propose strategies to overcome these Discuss strategies to meet the ethical needs of doctors
2 Principles of medical ethics	Discuss the four principles of medical ethics Discuss application of these four principles in clinical work	Analyse clinical situations where there is difficulty in application of principle of autonomy. Debate clinical situations where there is conflict between two or more principles of medical ethics. Construct a case for prioritising and allocating limited financial resources in a health service.
3 Ethical analysis in clinical work	Discuss the social and cultural limitations of these principles in the light of research evidence	Analyse clinical situations where the autonomy of the patient is at risk : Respect for confidentiality Obtaining informed consent Assessing competency Debate how to keep a balance between the rights of patients and their families
4 Duties and responsibilities of doctors	Discuss the duties of a doctor in the following areas: Dealing with patients Good clinical care continuing professional development Maintaining trust Duty to protect all patients Responding to complaints Dealing with colleagues Dealing with research & training Dealing with financial matters & certificates Dealing with the pharmaceutical industry Dealing with social responsibilities	
5 Ethical aspects of organ/kidney transplant	Discuss the need for organ transplant Discuss the prevalence of illegal organ/kidney sale in the region/country Discuss the exploitation of vulnerable people Review the highlights of 'Transplantation of Human Organs and Tissue Ordinance'	Discuss the controversy of organ donation Explore the moral aspects of organ sale Debate the case of selling a kidney in the light of principles of ethics Explore strategies to promote ethical organ transplant.

the most vulnerable sections of the society.²¹

6. Mental Health Care:

There are many misconceptions among health professionals about the concept of mental health. Some confuse it with mental illness and therefore focus on the domain of 'Psychiatry'. As a result, public health aspects especially issues relating to prevention and promotion of mental health are neglected in everyday medical practice. Let us, once again, refer to the definition of health which clearly implies that mental health is an integral part of health.¹⁴ As with physical health, mental health is also more than just the absence of mental illness. Roughly, a third of consultations in primary care have a significant mental health component.²²

Interestingly, Behavioural Sciences is the only subject which helps link these three domains of 'physical', 'mental' and 'social' with each other. As for mental disorders, Murray & Lopez²³ established a huge burden of mental disorders but

overall the contribution of mental health problems towards the global burden is projected to continue to rise alarmingly.²⁴ Sadly, the neglect of mental health issues also continues despite evidence of the high prevalence of mental disorders, the substantial burden on individuals and families and the availability of effective treatments.²⁵ Discrimination and violations of the human rights of the mentally ill have been reported from most countries.²⁶ For all these reasons, we propose that a separate module on the basis of mental health be included in this curriculum.

The recommendations made above are based on the authors' experience of teaching BS to medical students in developed and developing countries. Naturally, it is to be expected that other teachers and healthcare professionals may wish to include other topics, not mentioned here, or to de-emphasise some of the suggestions we have made.²⁷ That is only to be expected and is welcome. We repeat that our main aim is to start a discussion so that medical practice in Pakistan can become even more holistic and humane. Such a

Table-6: Mental health care.

Module 6: Mental Health Care		
Themes/topics	Learning outcome - Knowledge	Learning outcome - Skills
1 Introduction to mental health	Define mental health Discuss the role of positive mental health Discuss how mental health affects physical health; social aspects/social capital; spiritual health	Plan strategies to promote mental health
2 The burden of mental health problems	Discuss the 'Global Burden of disease'(GBD) and define 'Treatment Gap' Examine the burden of mental health problems Recognise prevalence of mental disorders in Pakistan Classify common mental disorders (priority disorders).	Estimate the costs of mental health problems in terms of: Disability, mortality, economic impact and burden on families
3 Recognising mental health problems		Identify changes (behaviour, emotions, thinking & function) that indicate mental health problems.
4 Preventing mental health problems	Describe general principles of prevention	Outline strategies for prevention (primary, secondary and tertiary) of mental health problems
5 Community mental health care	Discuss our healthcare system - the WHO pyramid Recognise the need for integrating mental health into primary care	Enumerate the responsibilities of a doctor (in primary care) towards mental health problems.
6 Mental health legislation	Explain the need for legislation in mental health care List basic principles of mental health legislation	Cite 'Mental Health Ordinance 2001'

discussion should involve not only current medical educators but other professional bodies with a potential interest in the area. This could include psychologists, sociologists, anthropologists and nurses among others. We await any comments with interest.

References

- The Lancet Commission. Health professionals for a new century: transforming education to strengthen health systems in an interdependent world. Early Online Publication, 29 November 2010. doi:10.1016/S0140-6736(10)61854-5
- Cuff PA & Vanselow NA. Improving medical education: Enhancing the behavioural and social science content of medical school curricula. Washington, DC: National Academic Press, 2004.
- Engel GI. The need for a new medical model: A challenge for biomedicine. *Sci* 1977; 196: 129-36.
- Editorial. The soft science of medicine. *The Lancet* 2004. 363: 1247.
- PMDC & HEC. Curriculum of MBBS, 2005. <http://www.pmdc.org.pk/LinkClick.aspx?fileticket=EKfBIOSDTkE%3d&tabid=102&mid=556>. Accessed on 2/12/2010.
- Isaac M, Rief W. Role of behavioural and social sciences in medical education. *Curr Opin Psychiatry* 2009; 22: 184-7.
- Humayun A, Herbert M. Integrating Behavioural Sciences in Healthcare (A Textbook for undergraduate and postgraduate training). Higher Education Commission, Pakistan, 2010.
- GMC. Tomorrow's doctors: Recommendations on undergraduate medical education. London: General Medical Council, 2009.
- GMC. Tomorrow's doctors: Recommendations on undergraduate medical education. London: General Medical Council, 1993.
- Bird J & Cohen-Cole S A. The three function model of the medical interview: an educational device. *Adv Psychosom Med* 1990; 20: 65-88.
- Fallowfield L & Jenkins V. Communicating sad, bad and difficult news in medicine. *Lancet* 2004; 363: 312-9.
- Carr JE. Advancing Psychology as a Bio-behavioural Science. *J Clin Psychol Med Settings* 2008; 15: 40-4.
- Chur-Hansen A, Carr JE, Bundy C, Sanchez-Sosa JJ, Tapanya S, Wahass SH. An International Perspective on Behavioural Science Education in Medical Schools. *J Clin Psychol Med Settings* 2008; 15: 45-53.
- World Health Organisation. Basic documents (43rd ed). WHO, Geneva 2001.
- Ahn AC, Tewari M, Poon C, Phillips RS. The clinical applications of a system approach. *PLoS Med* 2006; 3: 956-60.
- World Health Organisation. Annual Report of the Regional Director. Eastern Mediterranean Region. WHO, Cairo 2006.
- Rozanski A. Integrating psychologic approaches into the behavioural management of cardiac patients. *Psychosom Med* 2005; 67: 567-73.
- PMDC. Code of Ethics: For medical & dental practitioners. Islamabad: Pakistan Medical & Dental Council, 2001.
- Humayun A, Fatima N, Naqqash S, Hussain S, Rasheed A, Intiaz H, et al. Patients' perception and actual practice of informed consent, confidentiality and privacy are neglected. *BMC Medical Ethics* 2008; 9: 14.
- Shirazi B, Shamim M S, Shamim M S, Ahmad A. Medical ethics in surgical wards: Knowledge, attitude and practice of surgical team members in Karachi. *Indian J Med Ethics* 2005; 2: 94-6.
- Naqvi SA, Ali B, Mazhar F, Zafar MN, Rizvi SA. A socioeconomic survey of kidney vendors in Pakistan. *Transplant International* 2007; 20: 934-9.
- Goldberg D & Huxley P. Common Mental Disorders: A Bio-Social Model. London: Routledge, 1992.
- Murray CL & Lopez AD, eds. The global burden of disease: A comprehensive assessment of mortality and disability from diseases, injuries and risk factors in 1990 and projected to 2020. Cambridge, MA: Harvard School of Public Health on behalf of WHO & World Bank, 1996.
- Mathers CD & Loncar D. Projections of global mortality and burden of disease from 2002 to 2030. *PLoS Med* 2006; 3(11): e442.
- World Health Organisation. World Health Report. WHO, Geneva 2008.
- World Health Organisation. Resource book on mental health, human rights and legislation. WHO, Geneva 2005.
- Rana MH, Ali S, Mustafa M. A Handbook of Behavioural Sciences for Medical & Dental Students. University of Health Sciences, Lahore. The Army Press, Islamabad, 2007.