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CONTACT

Editor; The Journal of Shifa Tameer-e-Millat University (JSTMU)

Shifa Tameer-e-Millat University, Gate No. 1

Pitras Bukhari Road, Sector H-8/4

Islamabad, Pakistan.

Tel: +92-51-843-8056, Fax: +92-843-8067

e-mail: editor@j.stmu.edu.pk | m.editor@j.stmu.edu.pk

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Crisis or an opportunity: Are we learning from CoVID-19?

Afroze Liaquat¹

¹ Assistant Professor, Department of Biochemistry, Shifa College of Medicine, Shifa Tameer-e-Millat University, Islamabad, Pakistan

Correspondence

Afroze Liaquat

afroze.scm@stmu.edu.pk

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The world is currently facing an unprecedented scenario in the form pandemic of coronavirus disease (CoVID-19). The healthcare systems around the globe have been upended by the sudden surge of this disease, and Pakistan is no different. Hospitals, doctors and paramedical professionals are confronted with numerous predicaments which are entangled with medical, social and economic instability. The variations in the number of cases and deaths per day, the financial pressure, insufficient protective equipment's for healthcare staff one can speculate that the situation is unlikely to improve in the near future. While everyone is anxiously waiting for the vaccine to be developed, the only option is prevention. Sheltering-in-place, social distancing, use of personal protective equipment, sanitizing and de-fumigation is mandatory part of the standard operating procedures (SOPs) of all the institutions. As these restrictive measures are life-saving, therefore the public response in adopting them is also exceptionally well. This is all part of primary health care which according to WHO is; "A whole-of-society approach to health and well-being centered on the needs and preferences of individuals, families, and communities".¹ Therefore, in order to provide the best health care to the patients; clinicians, scientists and researchers around the world are working round the clock to provide latest guidelines to counter this disease and treatment modalities to improve the symptoms. Inflow of data regarding what is working and what is not is constantly emerging in almost all the medical journals, print media, social and electronic media. Governments along with funding agencies are all fully supportive of any evidence-based work that leads to the improvement of disease progress. In short, the world has put on a united

front to combat this virus. Although, the situation is challenging but it is imperative not to neglect other medical priorities. The lessons learned from this can be applied in providing an improved health care system.

Access to health care has been marginalized due to imposed restrictive measures; thus, it is absolutely essential to start thinking about what is coming next. Covid-19 has undeniably emerged as the most devastating health emergency in recent times; however, there is a bigger threat that has been looming constantly over the world for more than a decade. The pandemic accounting for more than 17 million deaths; cardio-metabolic disorders still remain the leading cause of mortality around the world.² Recent trends have shown a decreased mortality rate due to these disorders in the developed countries whereas; in low- and middle-income countries the figures are still sky rocketing. Moreover, the development of these disorders is initiated at a younger age causing amplified burden to individual itself, health care systems, society and especially national economy.³ The data around the globe has shown that people with risk factors and chronic disorders are more vulnerable and have shown adverse consequences compared to normal healthy individuals.⁴ It is therefore crucial to work and develop feasible and sustainable policies and systems which are directed towards prevention so as to minimize the overall disease burden.

In developed countries, robust preventive systems for cardio-metabolic disorders have been part of the routine health care,⁵ whereas, there is no such system in place in Pakistan. Although, provision of primary health care is the fundamental right of everyone, initiative towards primary prevention of non-communicable disorders has never

been prioritized. The current situation has provided us with an excellent opportunity to highlight this issue as well as to propose options that can be used to benefit population at large in a resource friendly way. People are already acclimatized to the use of telemedicine for medical advice. Print and Social media platforms are widely utilized for the dissemination of information. The age of SOPs has finally arrived in Pakistan and people are more receptive towards following the recommended rules. The health has become top priority at the government level and the efforts of medical professionals are being recognized. All these factors can be used to counter a more resilient problem i.e. the cardio-metabolic disorders.

Online preventive medicine clinics aligned with technology-oriented software programs is the need of the hour. The domain of these clinics would be to support the individuals who have not yet developed the disease but have acquired risk factors. These clinics do not essentially require specialized consultants; the work can be done by medical officers, nurses, nutritionists and fitness experts. Online internships for medical students can also be initiated for this purpose. This will emphasize on the importance to develop computer and IT expertise by the health care professionals. The access to these clinics can be through any virtual media available including phone, email and print/social media. Social media platforms are already favored by general population as means to interact with individuals having similar problems. People with similar goals are more receptive when they work together so as to achieve the desired response. Software directed continuous monitoring can help in optimization of risk factors, modifying physical activity and access to personalized diet plan according to individual's profile. Moreover, training to self-evaluate by monitoring vital signs and recognizing emergency symptoms and respond accordingly would help those in need. On-line teaching in schools, colleges and universities have also been evolved in a very short amount of time. These platforms can be used by the schools, colleges and universities to assess overall cardio-metabolic profile of all the children. Those who are at risk can be aligned with these online preventive clinics which would guide them as to how the cardio-metabolic profile can be improved. Their progress can be monitored with the help of software and

apps which can be developed by the institutions themselves and ideally it can be initiated at the government level. Similar models can be developed for any institute in which the employees are mostly sedentary and therefore at risk. With more awareness and guidance through these on-line preventive clinics, there would be decrease burden on the hospitals; moreover, it will provide an ideal opportunity to augment people's ownership towards their own health.

In conclusion, ramifications of CoVID-19 will be widespread and enduring. We need to start planning for the post-CoVID era. Sustainable and long-lasting methods should be developed in way that no one is left behind. By addressing these risk determinants general population will become self-aware about their own health, adapting to lifestyle change will be not be seen as an impossible thing and the burden on the hospitals and the overall health system will decrease. It will also be beneficial in an event of future similar calamities. We should learn from this one of a kind situation and utilize this crisis as an opportunity for the improvement of health care.

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Sources of stress in high performance healthcare organization: A study comparing intensive care and general ward nurses

Tamoor Gill¹, Gideon Victor², Raisa Kousar³, Noman Iqbal⁴

¹ Registered Nurse - BMT, Shifa International Hospitals, Islamabad, Pakistan

² Senior Lecturer, Shifa College of Nursing, Shifa Tameer-e-Millat University, Islamabad, Pakistan

³ Associate Chief of Nursing, Shifa International Hospitals, Islamabad, Pakistan

⁴ Lecturer, Department of Nursing, Islamabad Nursing College, Islamabad, Pakistan

Author's Contribution

¹ Conceive Idea

² Data analysis, interpretation, article writing

³ Article writing and intellection revision

⁴ Data collection, data analysis

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Correspondence

Gideon Victor

gideon.scn@stmu.edu.pk

A B S T R A C T

Objective: To compare stressors of nurses working in intensive care units and general wards of a high-performance health care organization.

Methodology: A comparative cross-sectional survey was conducted. Using stratified random sampling, 121 intensive care and 121 general ward nurses, cumulatively 242 were offered to participate in the study. IRB and EC approvals were obtained. A self-administered questionnaire with structured responses was used for data collection. The data were analyzed for descriptive and inferential statistics in SPSS 23.

Results: The study participants were predominantly 152(62.8%) female; 182(75.2%) having diploma in nursing and 169(69.8%) RN-I; 38(31.4%) intensive care and 35(28.9%) general ward nurse who were performing 12-hours shift duty; 50(41.3%) intensive care and 65(51.2%) general ward nurses were dissatisfied with their salary. The average patients assigned to intensive care nurse were two and six to a general ward nurse. Independent t-test and ANOVA revealed significant difference of stressors in intensive versus general ward nurses, gender, working hours, satisfaction with salary, professional qualification, experience and shift work (P-Value <0.05). Common stressors were unclear demands, pressured to work long hours, not having control at workplace and being not able to talk to line managers about something that has upset or annoyed them at workplace.

Conclusion: The general ward nurses face more stressors than intensive care units' nurses. Workplace stressors could compromise healthy working environment and patient safety whereas favorable environment could increase job satisfaction, staff productivity, and quality of care. Workplace-oriented stress management strategies must be adopted.

Keywords: Stress, nurses, intensive care, general ward

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Introduction

Nurses have been described as an occupational group at high risk of job stress due to demanding situations that they commonly face in the provision of routine nursing care.¹ A systematic review investigated stress among nurses from 1981-2011 and found stress in all of the included studies.² High patient acuity, heavy workload, and patient deaths contribute to the work-related stress.³ As a result work dissatisfaction, cardiovascular, digestive and musculoskeletal disorders

were found among intensive care units (ICU) nurses.⁴ High levels of stress result in staff burnout and turnover, which adversely affect the patient care.¹ The work environment of intensive care units and general wards (GW) is different. The routine work of ICU nurses is considered complex as compared to GW nurses.

It is therefore presumed that work diversity and environmental characteristics could affect working staff differently. For instance, typically ICUs and emergency

departments are loaded with healthcare technology to facilitate patient care, but they also increase sensory load. An emergency department nurse reported 742 adverse events over a period of one-month.⁵ Many nurses avoid working in such departments due to the mentioned consequences. Therefore, to retain and attract, many health care organizations offer special allowance to critical care department nurses. Some studies reveal that nurses who work with critical care patients are more predisposed to stress as compared to other areas of the hospital.⁶ While, a Malaysian study reported more stress among GW as compared to other department nurses.⁷ The implications of stress sources are reported as decreased job satisfaction,⁸ increased turnover rate, absenteeism,⁹ burnout,² compromised patient safety and work environment.¹⁰

High performance organizations demand high expectations but also offer favorable benefits to their employees. Therefore, stress and stressors among nurses may be different. These organizations are not studied well in this regard. Moreover, stress is studied well but sources of stress are not given much attention. Identifying source of stress is a cornerstone to stress management. For this purpose, management standards of health and safety executive (HSE) has been used widely.¹¹ This study aims to compare the sources of stress among GW and ICU nurses.

Methodology

A comparative cross-sectional design was adopted to conduct the study. Study was conducted at a private tertiary care hospital, which is situated in the Islamabad, Pakistan. A structured questionnaire was adopted and HSE¹¹ management standards was used for data collection. The Cronbach's alpha of the questionnaire in this study was 0.79. The tool contains of 35 items divided into seven subscales related to primary work-related sources of stress; demand, control, manager's support, peer support, relationship, role and change. Responses were measured in terms of frequency and agreement on a Likert scale. The frequency scale (1=never to 5=always) was used for item 01-23 and agreement scale (1=strongly disagree to 5=strongly agree) 24-35. The score was reversed for item 3, 5, 6, 9, 12, 14, 16, 18, 20, 21, 22 and 34 (5=never to 1=always while 5=strongly disagree and

1=strongly agree). Data was collected through a self-administered technique. Data collection was completed in October 2016. Stratified random sampling was done from ICU and GW nurses. We used following formula to calculate the sample size.

$$N = \frac{(Z_{1-\alpha/2} + Z_{1-\beta})^2(p_1(1-p_1) + p_2(1-p_2))}{(p_1 - p_2)^2}$$

Confidence interval of 95% at alpha; power of 99% at beta; P1 i.e. GW was taken 60% and P2 83.9% i.e. ICU from previous studies. The calculated sample for each group was 121 and cumulatively 242. Permission from institutional review board and ethics committee was obtained (IRB Reference # 526-375-2015). The written informed consent was taken from the study participants. Their participation in the study was entirely voluntarily. Data was coded and collected anonymously. Questionnaires were screened for errors and omissions. The data was entered in SPSS Version 23.0 for analysis. Descriptive statistics were obtained for demographic variables. Independent t-test and one-way ANOVA was applied to measure differences among subscales and their items. The p-value of <0.05 was taken as significant.

Results

Study participants comprises of predominantly female nurses. Comparatively, higher percentage of male nurses was working in ICU than GW. Among the sample, most nurses were diploma in nursing (DN) qualified whereas Bachelor of Science in Nursing (BSN) preferred to work in ICUs. Overall, 73 (30.2%) nurses were performing 12 hours' duty shift which was more common among ICUs. Most of the nurses had less than three years of experience and number of nurses decreased with gradual increase of experience. Salary satisfaction was higher among ICU nurses. Approximately half of the participated nurses showed dissatisfaction with their salary. Average patients assigned to ICU nurse were two and six to GW nurses (Table 1).

Table 1: Demographic characteristics of intensive care unit and medical, surgical nurses participated in the study

Demographic Variables		Area		Total
		ICU (121)	General Ward (121)	242
		f (%)	f (%)	f (%)
Gender	Male	52 (43)	38 (31.4)	90 (37.2)
	Female	69 (57)	83 (68.6)	152 (62.8)
Professional Qualification	DN	83 (68.6)	99 (81.8)	182 (75.2)
	BSN	25 (20.7)	19 (15.7)	44 (18.2)
	Post-RN BSN	13 (10.7)	3 (2.5)	16 (6.6)
Working Hours	08 hours	83 (68.6)	86 (71.1)	169 (69.8)
	12 hours	38 (31.4)	35 (28.9)	73 (30.2)
Experience	< 3 Yr.	81 (66.9)	88 (72.7)	169 (69.8)
	3.1 – 6 Yr.	33 (27.3)	21 (17.4)	76 (22.3)
	6.1 – 10 Yr.	4 (3.3)	7 (5.7)	11 (4.6)
	> 10 Yr.	3 (2.5)	5 (4.1)	8 (3.3)
Salary	Satisfied	71 (58.7)	59 (48.8)	130 (53.7)
	Dissatisfied	50 (41.3)	62 (51.2)	112 (46.3)
Nurse Patient Ratio	Mean	2.21		6.13
	Minimum	1		1
	Maximum	6		10

Cumulatively, the nurses in GW showed a higher mean score. The role subscale received the highest mean score which contributed to the higher mean score among GW nurses. The relationship subscale was rated lowest among the questionnaire's subscale and the mean score of GW nurses was higher. The mean score of GW nurses was high in control, demand and relationship subscale as well. Whereas ICU nurses had high score in peer support, change and managerial support subscale of the questionnaire as shown in Figure 1.

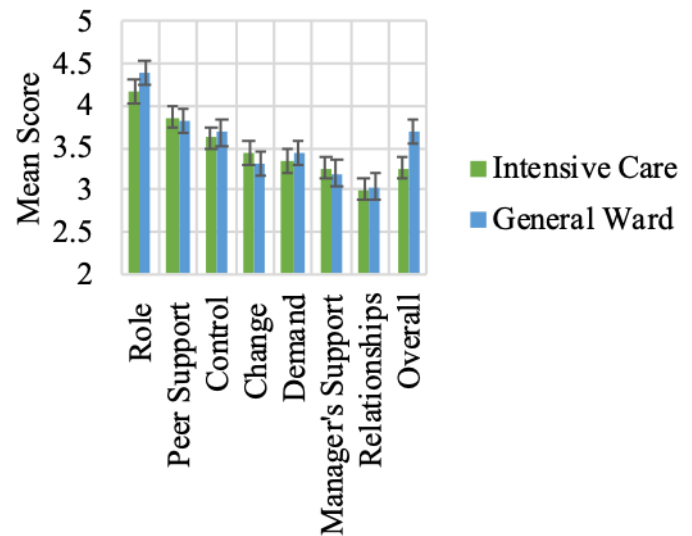


Figure 1: Comparison of intensive care and general ward nurses by questionnaire subscales

Table 2: Evaluation of stressors by workplace (ICU/GW), gender, work hours, salary, professional qualification, and experience

Sr.	Statements	Mean	SD	ICU/GW	Gender	Work Hrs.	Salary	Professional Qualification	Experience
				Significance (p Value)					
1	I am clear what is expected of me at work	4.20	1.07	.251	.808	.052	.822	.534	.091
2	I can decide when to take a break	3.45	1.33	.012 *	.347	.105	.014 *	.115	.191
3	Different groups at work demand things from me	3.44	1.08	.061	.617	.716	.575	.087	.467
4	I know how to go about getting my job done	4.30	0.96	.160	.524	.159	.520	.306	.410
5	I am subject to personal harassment	2.75	1.43	.391	.056	.450	.764	.013 *	.657
6	I have unachievable deadlines	2.84	1.39	.478	.602	.305	.394	.500	.695
7	If work gets difficult, my colleagues will help me	3.95	1.17	.269	.490	.036 *	.398	.501	.162
8	I am given supportive feedback on the work I do	3.72	1.27	.287	.103	.676	.641	.111	.034 *
9	I have to work very intensively	4.36	0.82	.134	.967	.969	.806	.020 *	.009 *
10	I am confident on my work speed	4.58	0.77	.001 *	.829	.865	.271	.363	.525
11	I am clear what my duties and	4.56	0.87	.078	.692	.047 *	.904	.741	.488

	responsibilities are								
12	I have to neglect some tasks	2.97	1.46	.585	.005 *	.010 *	.746	.003 *	.087
13	I am clear about the goals and objectives	4.29	1.00	.760	.592	.073	.154	.878	.704
14	There is friction or anger between colleagues	3.02	1.23	.195	.348	.934	.607	.018 *	.156
15	I have a choice in deciding how I do my work	3.44	1.32	0.54 7	.474	.925	.009 *	.101	.590
16	I am unable to take sufficient breaks	3.35	1.28	0.17 8	.032 *	.316	.532	.544	.316
17	I understand my work fits with organizational goals	4.11	0.97	0.56 8	.049 *	.043 *	.009 *	.530	.350
18	I am pressured to work long hours	3.14	1.32	0.05 6	.125	.944	.859	.444	.257
19	I have a choice in deciding what I do at work	3.28	1.25	0.08 4	.320	.600	.079	.431	.507
20	I have to work very fast	3.99	1.09	0.86 6	.318	.068	.076	.190	.057
21	I am subject to bullying at work	3.06	1.27	.018 *	.339	.307	.213	.134	.686
22	I have unrealistic time pressures	3.14	1.32	0.11 2	.024 *	.538	.878	.143	.462
23	I can rely on line manager to help me with work problem	3.20	1.40	0.33 6	.785	.714	.003 *	.143	.853
24	The way I work is acceptable	3.83	1.09	0.49 9	.784	.005 *	.014 *	.644	.886
25	I have some say over the way I work	4.04	1.02	0.11 6	.471	.005 *	.596	.111	.480
26	I have sufficient opportunities to question management	3.03	1.46	.034 *	.976	.275	.012 *	.223	.700
27	I receive the respect I deserve from my colleagues	3.76	1.20	.240	.322	.004 *	.014 *	.638	.656
28	Staff are always consulted about change at work	3.47	1.23	.881	.778	.001 *	.036 *	.837	.018*
29	I can talk to my line manager about something that has upset or annoyed me about work	3.16	1.38	.894	.775	.208	.725	.310	.661
30	My working time can be flexible	3.15	1.32	.225	.439	.089	.544	.785	.327
31	My colleagues listen to my work-related problems	3.85	1.02	.904	.088	.026 *	.034 *	.522	.769
32	When changes are made at work, I am clear how they will work out in practice	3.74	1.07	.002 *	.718	.015 *	.325	.412	.205
33	I am supported	3.19	1.28	.737	.363	.566	.188	.028 *	.253

	through emotionally demanding work								
34	Relationships at work are strained	3.30	1.37	.001 *	.425	.462	.655	.376	.711
35	My line manager encourages me at work	2.94	1.57	.639	.852	.022 *	.002 *	.676	.013*
	Overall	3.47	1.30	.012 *	.215	.004 *	.664	.001 *	.685
Cronbach Alpha = 0.79									

* p-Value <0.05

An independent t-test was applied on workplace (ICU and GW), gender, working hours and salary while ANOVA on professional qualification, experience and shift work. All nurses were clear about the goals and objectives for their respective departments. They were primarily stressed due to ambiguity of demands by members of healthcare team at the workplace. They were pressured to work long hours and did not have control at workplace. They were not able to engage with their line managers about something that has upset or annoyed them in the workplace.

ICU and GW nurses revealed their difference with regard to decision on taking a break, confidence on work speed, experience of bullying at workplace, opportunity to question manager about work, informed changes at the workplace and they also reported strained relationship at work ($p < 0.05$). Male nurses reported that they have to neglect some tasks due to work overload. They were unable to take sufficient breaks and have unrealistic time pressures as compared to their female counterparts ($p < 0.05$). Nurses performing usual working hours i.e. eight hours reported changes at work are communicated. Subsequently, they also have to neglect some tasks at their workplace. Their colleagues listened to problems, offer help at the times of difficulty and respected them. While nurses performing 12 hours working shift accentuated that they were consulted and have a 'voice' at the workplace ($p < 0.05$).

Nurses who were satisfied with their remuneration reported that they understand how their work fit into the overall aim of the organization and receive respect. They reported sufficient control at workplace i.e. taking breaks, way of work, and decision making. Their colleagues listened and responded to their problems; manager helped them out with a work problem as compared to the nurses

who were dissatisfied. While, dissatisfied nurses felt discouraged and they were not able to question their manager about change of routine and policies at workplace ($p < 0.05$). Nurses with BSN degree reported that they have to neglect some tasks because they have too much to do at their workplace. They felt supported in highly emotionally and work demanding situations. This group of nurses experienced friction or anger between nurses with regard to diploma and degree qualifications. Nurses also reported personal harassment in the form of unkind words or behavior ($p < 0.05$).

More experienced nurses reported that they were always consulted and involved in decision making process as compared to less experienced ones. While, less experienced nurses were given more supportive feedback for performance improvement. Intensity of work was one the stressor among less experienced nurses ($p < 0.05$). Determinants of stress varied among nurses who were performing shift i.e. morning, evening and night duty. Their colleagues were willing to listen to their work-related problems. They were clear about work expectations therefore they know how to get their job done ($p < 0.05$) as shown in Table 2.

Discussion

This study findings illuminate that GW nurses experienced more stressors than ICU nurses. The mentioned study findings are inconsistent with study¹² reporting comparatively higher level of stress among ICU nurses. Most studies^{6,13,14} found comparatively higher level of stress among ICU nurses, while a study⁷ reported higher stress among GW nurses than other units' nurses.

More or less, both ICU and GW nurses informed stress which confirms with a systematic review spanned over 30 years.² Generally, nurses were clear about expectations and responsibilities. Role clarity is important to design and organize patient care activities. On the other hand, role ambiguity creates confusion and a barrier to role performance. The direct link of role ambiguity was found with burnout and staff absenteeism.¹⁵ This link was established in current study when nurses pointed out 'ambiguity in demands from different groups at workplace'. A common stressor for nurses was pressured to work long hours. A Chinese study¹⁶ report long shift work as the highest source of stress. Long working hours

cause exhaustion and decrease ability respond promptly in critical situations; negatively impact emotional health of nurse and patient care. Nurses reported lack of control to plan patient and unit management activities. It could produce a sense of powerlessness leading to source of stress. However, an authority to plan patient and management activities would boost confidence and a buffer for stress. The nurses' control over nursing practice is associated with job satisfaction, healthy work environment and improved patient outcomes. It also increases confidence of the nurse to make patient care decision i.e. valued and linked with patient safety.¹⁷ Lack of managerial support and coordination was also highlighted as major source of stress. Lack of managerial support is linked with burnout while encouragement, engagement at work improves staff retention. The nurse manager's role in staff motivation, encouragement, dignity and respect is also emphasized.¹⁸

Findings revealed that critical care nurses could decide when to take break and had opportunity to question manager about workplace activities as compared to GW nurses. Perhaps, critical care nurses were more organized and managed their time well and their manager was readily available to support and solve problems. While GW nurses were confident on their pace of performing patient care activities irrespective they experienced bullying and strenuous relationships at workplace. GW nurses were more informed about changes at their respective working units. Finding of more stress among GW nurses is inconsistent with a study done by Ganz and colleagues¹⁹ which reported alarming percentage of bullying among ICU nurses. The cost of bullying to the organization is very high in terms of nursing shortage, turnover and, absenteeism, adverse events, quality of care and patient safety.¹⁰ Strained relationship among nurses could deteriorate the working relationship and is a source of stress. The work overload is associated with negative patient outcomes²⁰ in many studies. This workload is reflected in nurse patient ratio; ICU nurses were mostly assigned two patients and few times six. A retrospective study²¹ highlighted that increased nurse patient ratio from one-to-one in ICU, increased the mortality rate. Henceforth, patient survival is linked with appropriate staffing.

Male nurses reported that they have to neglect some tasks due to work overload. They were unable to take sufficient breaks and have unrealistic time pressures as compared to their female counterparts. This difference maybe that male nurses experienced lack of support and had more assignments than their female colleagues in the study²² highlighted intra-disciplinary hierarchies and mutual non-supportiveness in nursing. Working under unrealistic time pressures decrease staff performance²³ and compromise patient safety.

Nurses performing usual working hours i.e. eight hours were well informed about workplace routines and policy changes. They have to neglect some tasks at their workplace. Perhaps they were not ready and prepared to cope with changes. Maybe nurses working 12 hours had more time to complete tasks. Colleagues of eight working hours listened to each other problems and offered help to their colleagues, offered help at the time of difficulty and for this reason experienced more respectful relationship. Stressors were significantly higher among ICU nurses who worked long hours which affirms the findings that long working hours cause physical and emotional exhaustion¹⁶ effecting working relationships negatively. Nursing literature highly regards peers support and respectful collegial relationships. The mediating role of peers to reduce stress and increased job satisfaction is highlighted.²⁴

High performance health care organization demands their staff to work effectively and offer satisfying remunerations. Many nurses were dissatisfied with their salary and felt strained relationship with their managers. Studies have shown lack of congruence between demanding work and lack of salary as a source of stress.²⁵

There were two groups pertinent to professional qualification; nurses having DN and BSN. GW nurses with BSN degree reported that they have to neglect some tasks because they have too much to do at their respective units. DN experience intense clinical work during their training. Perhaps for this reason, they cope well with demanding situations and experience less stress. This group experienced friction or anger between nurses having different qualification. Nurses also reported harassment in the form of unkind words or behavior. Harassment is illegitimate and damaging for working

relationship. As a result, patient pay the cost due to lack of quality care.¹⁰

Less experienced nurses reported more stressors as compared to more experienced ones. Intensity of work was the main stressor among less experienced nurses though often received supportive feedback. Studies have shown younger and less experienced nurses were more predisposed to stress.²⁶ Maybe they were not competent enough to take on the role in a high performance nursing environment.

There were more nurses with DN than BSN and female with lesser experience. Therefore, result would be more significant for the greater population. Results should be cautiously generalized, since the study was from one private institute. A multicenter study focusing specific nursing sample could help understand common sources of stress.

Conclusion

In conclusion, GW nurses experienced more stressors than ICU nurses. BSN qualified nurses reported high stressors. The common stressors among GW and ICU nurses were identified including role ambiguity, unclear demands, pressure to work long working, not having control at workplace, lack of communication with nurse manager and upsetting events at the workplace. The BSN nurses highlighted harassment in the form of unkind words, lack of emotional support and friction among colleagues while DN reported intense work routine as significant stressors. GW nurses reported bullying; unable to complete tasks, eight hours duty shift whereas ICU nurses experienced unachievable deadlines and male nurses as difficult colleagues' significant workplace stressors. On the other hand, collegial support was highlighted as buffering agent against stress. There is heavy price for unmanaged stress in the form of adverse events, increased turnover, compromised quality and safety. Therefore, workplace-oriented stress management strategies focusing stressors are recommended.

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Exploring standards of assessment for MHPE programs in Pakistan: Perspective of program directors

Liaquat Ali¹, Rahila Yasmeen², Afrose Liaquat³

¹ Professor, Department of Physiology, Frontier Medical College, Abbottabad, Pakistan

² Dean, Riphah Academy of Research and Education, Riphah International University, Islamabad, Pakistan

³ Assistant Professor, Department of Biochemistry, Shifa College of Medicine, Shifa Tameer e Millat University, Islamabad, Pakistan

Author's Contribution

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² Supervision

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Correspondence

Liaquat Ali

docliaquat5@gmail.com

A B S T R A C T

Background: Masters in health professions education (MHPE) programs in Pakistan has created many challenges for its curricular components. It is necessary to explore these components in the local context, so as to agree to what constitutes minimally agreed MHPE standards.

Objectives: To identify the similarities and variations in assessment of MHPE Programs of Pakistan.

Methodology: Collective case study design was used to collect data from 07 programs directors about assessment methodology/policy used in their programs through semi structured interviews. After transcription of interviews and open coding, axial codes were transferred to Microsoft excel sheet for themes identification through content, thematic and discourse analysis simultaneously using NVIVO software, word frequency and matrix coding queries. Trustworthiness of data was ensured through credibility, conformability, dependability and transferability.

Conclusion Formative assessment, assignments, end of term examination and thesis defense are similarities of different programs proposed as minimum standards for existing and future programs. OSTE is proposed as variations and guidelines for accrediting agencies and EPAs, self-assessment, peer assessment and online assessments are the challenges tasks ahead to work.

Keywords: Standards, masters, MHPE, faculty development

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Introduction

Masters in health professions education (MHPE) programs number has rapidly increased in the recent years to 121 in 2014.¹ In Pakistan in a short span of time 7 programs have been inaugurated in different parts of the country.² This increase in number is due to efforts of accrediting bodies and attractive format of MHPE that include face to face contact and online self-directed learning that suits working class in their extremely busy schedule. In USA: ACGME (Accreditation council of graduate medical education)³ in Canada: canMED (Canadian Medical Education Directives) competency framework,⁴ in UK: GMC (General medical council) guidelines on tomorrow's doctor^{5,6} and LCME^{7,8} (Liaison

committee of medical education, a body authorized for accreditation by World federation of medical education) have emphasized to implement instructional and assessment standards. This have forced medical institutions world over to hire trained manpower in medical education to implement these standards which though are voluntary but must be contextualized for implementation. Moreover, MHPE program's credentials immerse students in culture of research and scholarly work for 2-3 years and help in acquisition of knowledge of theories and practice in the context of modern educational trends world over. Rapid increase in number raise concerns regarding quality of medical education being delivered in these programs and question of similarity, variation and challenges facing these programs.

Harden's ten questions have been used to develop new curricula since 1985. These questions provide a framework of steps involved in curricular planning and development. This framework has been previously used to analyze medical curriculum in University of Gezira, Saudi Arabia in 2017.⁹ Higher education commission (HEC) of Pakistan masters' standards grant exemption of thesis and introduced additional course work in lieu of thesis, however, this could not be considered for MHPE program. Similarly, World federation of medical education (WFME) postgraduate standards were also exempted for MHPE format as it had a different format from face to face and online self-directed learning. WFME published its master's standards in late 2016 when current research study was well in progress. These standards mirror the framework of the trilogy of Basic medical education (BME), Post graduate (PG) and continuing professional development (CPD) standards which were revised in 2015, but there is no distinction between basic and quality development standards. Hence Harden's ten question framework¹⁰ (Table 1) was used in the context of WFME domains standards in the current study. Moreover, to develop local contextualized curriculum standards (assessment for the present study), the perspective of MHPE program directors who were involved in the design of these programs from their program's inception is extremely important.

Aims and Objectives

The main objective was to explore MHPE curricular components focusing especially on assessment using a protocol based on Harden's 10 question framework and WFME domains. A consensus opinion of the program directors of 07 programs operative in Pakistan was taken that can assist in developing contextualized local standards.

Table 1: Harden's 10 questions framework.

Harden's 10 questions	
Q1	What approach was followed in the need assessment of MHPE?
Q2	What are aims and objectives of your course?
Q3	What is the minimum number of modules that need to be taught in MHPE program?
Q4	Should a particular sequence be followed while teaching these modules?

Q5	How do you balance contact session time with self-directed time during implementation of modules within limits of SPICES model as an educational strategy?
Q6	Most of the MHPE programs have contact session in the beginning to promote peer assisted learning while others have kept these at the end of module to promote self-directed learning. What is your experience about advantages of 02 methodologies?
Q7	What is your overall assessment policy?
Q8	Is any other method of communication being used with students apart from email and web-based information for communication of program curricular contents?
Q9	How do you ensure friendly educational environment at own & student's workplace in term of providing full text articles, VPN account and access to the library?
Q10	How do you manage availability of qualified and experienced faculty for your program and how do you balance the availability of local and foreign faculty as a part of process management?

Methodology

Qualitative descriptive collective case study design was used to collect the data. Miles and Huberman¹¹ in 1994 contended that studying multiple cases gives the researcher reassurance that the events in only one case are not "wholly idiosyncratic". All participants were given special names for maintaining confidentiality. Telephonic interviews were conducted using semi-structure open ended questions; data was collected from program directors of 07 programs. The responses were transcribed in NVIVO pro 11 software and open coding was done for storage in nodes. Codes having some relations (axial codes) were transferred to Excel sheet for identification of themes using content, thematic and discourse analysis as described by Ryan et al.¹² Simultaneously various queries were run in NVIVO for content analysis and observation of emerging patterns. Themes identified from 04 or more program directors were proposed as contextualized assessment standards. Minority themes were labeled as variation proposed for guidance of accrediting agencies at the time of accreditation. Challenges were also identified as tasks to be done in future by stakeholders. Credibility (internal validity and reliability), conformability (objectivity), dependability (external reliability) and transferability (external validity) were used for trustworthiness of the data. Harden's 10 questions including those of assessment were contextualized and validated by Riphah university medical education department's experts. Exploratory questions regarding continuous summative

assessment, OSTE (objective structured teaching examination) and EPAs (entrusted professional activity) were included for assessment of certain WFME outcome domain standards.

Results

A total of seven participants were interviewed. Out of 7 participants, 72% (n=5) were male and 28% (n=2) were female. Average age of the participants was 53.7 years (range 49-58). Mean experience as instructor was 16 years (range 11-32 years) and mean experience as program director was 4.28 years (range 1-6 years). All participants were actively and decisively involved with medical education departments of their respective institutions.

Questions regarding assessments generated similar responses from the program directors. Almost all of them agreed that assignments with 40% weightage and end of module/end of term examinations with 40% weightage and thesis/research project with 20% weightage are the core assessment tools. In addition; punctuality, participation, presentations and active contribution are some of the components of internal assessment. OSTE (observed structured technical examination) self-assessment, peer assessment, online assessment and EPAs (entrusted professional activity) are the future challenges for stakeholders. Individual responses to questions are presented in the tables 2-5.

Table 2: Questions regarding assessment I

Questions Regarding Assessment I	
Q: What is your overall assessment policy?	
Respondent 1	Continuous summative assessment based on assignments.
Quote	[We give 60% weightage to continuous assessment and 40% weightage to end of course assessment. Now within this continuous assessment again we have broken it down to individual work, group work and end of the session face to face assessment. Continuous summative assessment is broken down into components, so that student does not fail because of failing in one component only]
Respondent 2	We have formative and summative assessments. Continuous summative assessment is based on assignment and overall behavior e.g. Attendance, punctuality, performance in presentation and participation

	and OSTE. End of term examination is a high-stake examination and in the end is Thesis defense. Weightage of different components is (40/40/20)
Quote	[We have two types of assessments. Formative assessment and summative assessment. We have formative assessment i.e. ongoing assessment which is on and off constructive feedback to improve knowledge, skills and behavior. Summative assessment is in the form of assignments system, we have workplace based and evidence-based assessments at the end of course depending upon credit hours of the course, students gets marks based on 40% weightage for assignments they do it, 40% for the end of term assessment and 20% for thesis. For the knowledge we have MCQs and SAQ. For skills we have OSTE examination, we also assess dissertation for writing skills].
Respondent 3	Formative and summative assessments, Continuous summative assessment based on assignments, OSTE (observed structured technical examination), Thesis defense, End of term examination, Different weightage of components.
Quote	[Well we have 6 contact sessions and for each session we have 3 assignments. Then we have formative assessment in the form of providing feedback to the students. 20% assessment is what we call internal. So assessment includes written assessment, formative assessment, summative assessment and thesis assessment by reviewers and ultimate defense which is done by 2 reviewers. A balance has been developed among various components of assessment. Sometimes you have to make rules and regulation to fulfill the requirements of the regulation body or HEC]
Respondent 4	Continuous summative assessment, End of term assessment, Weightage of different components (70/30)
Quote	[We have hybrid plan of continuous summative assessment as well as end of the year assessment in a proportion of 70% and 30%]
Respondent 5	Continuous summative assessment based on assignments, End of module assessment, End of term assessment and Thesis defense
Quote	[In overall assessment we have the assignments, the exam at the end of module and finally an exit exam. That is how we assess our students and finally the thesis to assess their research potential].
Respondent 6	Continuous summative assessment (60% pass) Thesis defense

Quote	[If someone achieves 60% in final assignments he passes. Our assignments are not MCQ. They are based on critical thinking and checking other valuable abilities of scholar, researcher and expert teacher. If a student achieves less than 60% marks as aggregate in their assignments he fails. Finally, we have thesis for assessment of research potential]
Respondent 7	Institutional policy
Quote	[At our institution we follow the assessment policy of our university].

Table 3: Questions Regarding Assessment II

Questions regarding Assessment II	
Q: Can EPAs (Entrusted professional activity) become building blocks of a competency or outcome based MHPE curriculum?	
Respondent 1	No for EPA
Quote	[Philosophy is outcome-based competency that is time bound and thus can't be implemented]
Respondent 2	Mainly for workplace
Quote	[EPA is mainly for workplace]
Respondent 3	Yes, for EPA
Quote	[May be in future, availability of time is hurdle]
Respondent 4	Yes, for EPA.
Quote	[Can be in future if time allows]
Respondent 5	Yes
Quote	[Can be considered in future as it is mainly for workplace].
Respondent 6	Yes, for EPA
Quote	[Can be implemented but it is mainly for workplace]
Respondent 7	No

Table 4: Questions regarding Assessment III

Questions regarding Assessment III	
Q: What is the rationale of continuous assessment if end of the term assessment has to take place in addition to the continuous assessment?	
Respondent 1	Assessment of critical thinking and evidence-based practice
Respondent 2	No end of term examination (not useful)
Respondent 3	High stake examination (end of term)
Respondent 4	University rules
Respondent 5	University rules
Respondent 6	For overall assessment
Respondent 7	Assessment of integrated skills

Table 05: Questions regarding Assessment IV

Questions regarding Assessment IV	
Q: Is OSTE (Objective structured technical skills examination) a component of overall assessment?	
Respondent 1	Yes
Respondent 2	Yes
Respondent 3	No
Respondent 4	Yes
Respondent 5	No
Respondent 6	No
Respondent 7	No

Discussion

All programs assess students by assignments and give almost same weightage i.e. about 40%. All agree to formative and summative assessment. All adopt continuous summative assessment system. All programs have a research project as a requirement for successful completion of the course. Sara thinks continuous summative assessment is helpful in assessing comprehensively, Rida thinks end of term examination is a must as it is a high-stake examination as shown in Table 02. She and most of programs conduct OSTE, whereas Wazir thinks that it is premature entry in assessment system. Although all programs have a research project with article writing as a requirement, Malik and Inam think that thesis writing is not an essential component. Still others believe that they have to follow university policy to have both continuous summative assessment and end of term examination.

The opponents of the end of term examination think that assessing students by MCQ or SAQ does not promote critical thinking and scholarly characteristics among students that is the aim of the course. While comparing with WFME standards the PD were meticulous in following instructions of educational process, instructional and learning methods, program scope, contents and context, research and scholarship, program structure and duration and process of curriculum development.¹³ The instructional and learning strategies include a blend of face to face learning, distant learning, online learning, individual and group learning, independent learning, e-learning, supervision, mentoring, tutorials, seminars and workshops. WFME want to promote independent thinking, creative problem solving,

synthesizing information, developing communication and appreciation of social, environmental and cultural implication of action of students in their new roles as education leader.¹³ The curricular contents were specially geared to meet these expectations. Course Program structure, contents, duration and fee were clearly communicated and research and scholarly activities introduced by international level quality research teams. However, the student's involvement in curricular development process as desired by WFME was demanding in almost all programs.

Similarities and Variation (Assessment System)

Assessment system of all programs is as per WFME guideline. The assessment system is rationalized against promoting critical thinking, independent thinking, and creative problem-solving skills in the light of best evidence-based practice from the literature. Knowledge and skills are examined by "end of term examinations and OSTE" and research and scholarly skills by thesis writing and defense. Student's behavior during contact sessions, punctuality, participation, presentation and communication skills are scrutinized during the contact sessions. "Continuous summative assessment" promotes useful learning as students are also being observed closely in community of practices, groups sessions during self-directed and independent learning time and during discussion related to assignments and aspects of professionalism and again during e-learning especially for confidentiality of participants, use of non-civilized language and pasting of objectionable material against others names. Assessment also includes formative assessment with frequent feedback after each assessment. However, there was no mention of self-assessment, peer assessment and online assessment by any PD in their interviews.

In 1998 the process of assessment standards was started by WFME in policy document.¹⁴ MHPE standards were available in Feb 2016.¹³ In 2009 Downing, in 2012 Altahawi,⁶ in 2015 Fitzgerald⁷ talk of various challenges in assessment in health professions in general and issues related to students perspectives, competency and portfolio based assessments. Self-assessment is integral to many appraisals. In 2008 Colthart¹⁵ talks of self-assessment on identification of learner needs, learner activity and impact on clinical practice. The issue of ideal

method of comprehensive assessment is not resolved and would continue to remain so in the scenario of ever-changing methods of instruction, curriculum, required competencies and outcomes. Online assessment is another viable available tool depending upon quality IT networking.

EPAs as competency

In 2008 Beth and Bierer et al¹⁶ at Cleveland clinic college of medicine faculty decided that assessment should enhance learning and adopted only formative assessments to document student performance in relation to nine broad-based competencies. No grades were used to judge student performance throughout the 5-year program. Instead, assessments were competency-based, related directly to performance standards, and were stored in e-Portfolios to track progress and document student achievement. The class size was limited to 32 students a year. In 2012 Gruppen¹⁷ proposed competency-based model for preparing health professionals and constructing educational programs for improving global health. In 2013 Eglar et al¹⁸ used competency-based education in family medicine. In 2005 Reich et al¹⁹ designed comprehensive educational competency improvement program for their residents in medicine and in 2007 Dannifer²⁰ devised portfolio-based approach to a comprehensive, competency-based assessment system that is fully integrated with the curriculum to foster an educational environment focused on learning.

Similarities and Variation (EPAs as competency)

However almost all PDs objected to the idea of introducing EPAs in medical education to make it a competency-based program with the plea that EPAs are clinical related activities and are not time bound whereas MHPE is a time bound course. Every PD has to make a willful effort to introduce some competency-based curriculum in which outcome could be observed by some assessment tool.

Conclusion

This study has helped to bring program directors of seven MHPE programs in the country together. Assignments (40-60% weightage) and end of module/ end of term assessment (40% weightage) are agreed as

similarity and proposed as contextualized local assessment standards, whereas, OSTE and internal assessment including punctuality, participation, presentation skills are proposed as variations for guidance of accrediting agencies. Accreditation of these programs and implementation of newer methods of assessment, like EPAs, self-assessment, peer assessment and online assessments are the future challenges. Further studies are required to know the perspective of the students.

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Assessment of facility-based emergency care services for road traffic injuries in tertiary care hospital, Larkana

Mansoor Ahmed Qazi¹, Saima Rafi²

¹ Demonstrator, Department of Community Medicine, Shifa College of Medicine, Shifa Tameer-e-Millat University, Islamabad, Pakistan.

² Demonstrator, Department of Community Medicine, Shifa College of Medicine, Shifa Tameer-e-Millat University, Islamabad, Pakistan

Author's Contribution

¹, ² Manuscript writing, compiling data and analysis

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Correspondence

Mansoor Ahmed Qazi

kazi.mansoor.nisar@gmail.com

A B S T R A C T

Background: Road traffic injuries are considered as main public health problem; strenuous efforts are required for its prevention. Facility based emergency care for road traffic injuries is considered as an important but challenging component of post-crash care response. It demands healthcare providers to make quick life-and-death decisions based on minimal information. The objective of our study was to explore the challenges for emergency services for road traffic injuries within Tertiary care hospital.

Methodology: Qualitative methods were used including 15 interviews and 02 focus group discussions. Topic guide was developed for all the participant's interviews, in order to explore the challenges for effective emergency care services at tertiary care level in Larkana city, Sindh. Topic guide was developed for all the participant's interviews.

Results: After making the transcripts of qualitative data, thematic analysis framework was used to analyze the transcripts, by which two main themes; recognition of causes and adverse consequences of road traffic accidents and health system challenges for delivering emergency care were extracted. Results suggest that improvement in documentation and record keeping system, security for health care providers, provision of timely interventions and proper training for health professionals at hospital level can be helpful for the provision of effective emergency care services.

Conclusion: An integrated trauma care system along with the improvement in documentation, efficient record keeping system, security for health care providers, provision of timely interventions and training for health professionals is needed for effective post-crash care management at the hospital level.

Keywords: Road traffic accidents, post-crash care, emergency care system, emergency medical services, health care providers, Larkana.

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Introduction

Rising population has not only created voluminous socio-economic and environmental apprehensions but has mounted the number of road traffic accidents as well, therefore, making it as an important public health issue. Generally, Lower middle-income countries are showing upward trend of lives lost due to road traffic accidents in comparison to higher middle-income countries. As Road traffic accidents are responsible for 90 percent of disability

adjusted lives lost years (DALYs) and 85 percent of all deaths.¹

Globally, out of all causes of deaths, Road traffic accidents is ranked third on the list which involves all the individuals ranging from five to forty-four years of age group. According to the statistics, 3000 deaths occur due to the road accidents daily, and approximately 1.3 million

people succumb to road traffic accidents annually. Moreover, several researches have suggested that, about 20 to 50 million people round the globe, experience certain level of physical disability due to the road traffic incidents and live with that for their whole lives afterwards.^{2,3} Ironically, situation for Pakistan is not different, about 25 thousand to 30 thousand deaths occur due to the road traffic accidents annually and it's predicted that, half the number of casualties will be caused by road traffic accidents alone by 2020, stated by World Health Organization. Pakistan's Road traffic accident mortality rate is 14.2 per 100 thousand populations.⁴ It is estimated that, if required efforts will not be taken then road traffic injuries by year 2030 would become 7th prominent cause of death. As per Sustainable development goals agenda by the year 2020, target has been set to lessen the number of deaths and injuries due to road traffic accidents. Among Other Non-communicable diseases injuries share 11 percent of the total burden of diseases in Pakistan, due to the increasing population, rapid urbanization the number of road traffic accidents likely to be increased⁵ so, it requires concerted efforts and inter-sectoral collaboration to minimize burden due to road traffic accidents.

Methodology

Qualitative methods were used in order to explore the challenges for effective emergency services at, tertiary care level. Study was conducted in tertiary care hospital, Larkana, Sindh. This area was chosen because of the importance of its location, as it surrounds the web of main roads that makes it vulnerable to road traffic accidents. General hospital information is mentioned in Table 1.

Table 1: Hospital Information

Health workforce Staff	Numbers
Physicians	3
Surgeon	3
Gynecologists	3
Pediatricians	3
Doctors/GMO	295
Nurses	120
Dentists	13
Total beds	1250
Emergency ward bed	50
Daily OPD	2000-3000

Study was conducted among emergency health care providers like, administrator/manager emergency ward, Head of surgery, Head of Nursing, senior medical officer and surgical intern of emergency in tertiary care hospital, Larkana. All personnel involved in emergency care working in the hospital were interviewed during day shifts. 15 in-depth interviews and 02 Focus group discussions were conducted after taking verbal consent and each interview took approximately 30-60 minutes. For the interviews, topic tool guides were developed for each type of study participant, the key areas broadly covered in the interview guide were, to assess the perceptions of emergency health care providers regarding increasing number of road traffic injuries and its overall impacts on health system, along with the knowledge about the importance of emergency care services for road traffic injuries and lastly, challenges faced by health care providers while giving emergency care for road traffic injuries.

Results

Total 15 in-depth interviews (IDI) and two Focus groups discussions (FGD) were conducted. The participants (Administrator/manager emergency ward, Head of surgery, Head of Nursing, Senior medical officer and surgical intern in emergency) were interviewed to assess their perceptions regarding increasing number of road traffic injuries and its overall impacts on health system, Knowledge about the importance of emergency care for road traffic injuries and challenges faced by health care providers while giving emergency care for road traffic injuries. Thematic analysis was done, after transcribing the interviews and reading the data again and again familiarizing with the data, initial relevant codes were extracted from the data after reviewing those codes sub themes and two main themes identified and named were "Recognition of causes and consequences of road traffic accidents" and "Health system challenges for delivering emergency medical services". Topic guide mentioned in Table 2.

Table 2: Topic Guide for In-depth Interviews and Focus Group Discussions.

Topic Guide	
Respondents	Questions asked
IDI for Managers / Administrators:	<p>I would like to begin by asking about your perceptions regarding the increasing number of road traffic accidents and its overall impacts on the health systems.</p> <p>1: What are your views regarding increasing number of road traffic injuries? Share your views with us?</p> <p>-Can you give us a brief insight/detail about the type of cases you get in your emergency?</p> <p>-Tell us about the number of patients you get related to road traffic injuries (approx.: no per month).</p> <p>2: Do you think that road traffic accidents as an important public health issue and responsible for increasing burden on our health systems and how?</p> <p>-What steps are needed to minimize burden due to road traffic accidents</p> <p>3: Do you think there is a need of making a proper policy for road safety and efforts for reducing the traffic accidents?</p> <p>-Tell us about the efforts or strategies which can limit the fatalities related to road traffic accidents.</p> <p>-What can be done to get all the local and regional political leaders together to address this issue?</p> <p>-As evident from my literature search, how to address the prevailing research gap related to the emergency care system for road traffic injuries in Pakistan?</p> <p>Now I would like to know about your perceptions regarding importance of emergency care system for road</p>

<p>traffic injuries and different strategies exist in your hospital.</p> <p>1: Do you think by providing effective and timely emergency pre and post-crash care can actually play a vital role in lowering the death toll?</p> <p>-Tell us how lowering the death toll plays an important role in improvement of your hospital emergency care system?</p> <p>-Do you provide proper rehabilitation facilities including occupational and physiotherapy for the injured patients?</p> <p>2: In your hospital for quality trauma care in emergency departments, what kind of strategy exists for the planning, organization and provision of timely emergency care?</p> <p>-Can you tell us about the injury care including triage (allocating aid) for resuscitation and management in your facility?</p> <p>3: As it's a tertiary care hospital and the link between primary, secondary and tertiary centers is essential so what channels are utilized to maintain the communication with other levels of care?</p> <p>-Why it's really important to maintain the communication between the other levels of care?</p> <p>-What can be done to improve communication with the other levels of care?</p> <p>Now I would like to know about the challenges you face during the provision of emergency care for road traffic injuries and how to address them.</p> <p>1: What challenges do you face while dealing road traffic injuries on the hospital level?</p> <p>-Do you think in Pakistan trauma related emergency care needs to be</p>

	<p>revamped?</p> <p>-In your opinion do you think there is a shortage of trained doctors and other health related personnel in emergency departments?</p> <p>-Do you think that instituting of operative trauma care systems, along with proper documentation and record system is a need of an hour?</p> <p>1: How to address those challenges within possible available resources and improve the level of emergency care?</p> <p>-What message in particular do you want to give to the policy makers to address this issue?</p>	<p>emergency care system for road traffic injuries and different strategies exist in your hospital.</p> <p>1: Do you think by providing effective and timely emergency pre and post-crash care can actually play a vital role in lowering the death toll?</p> <p>-Tell us how lowering the death toll plays an important role in improvement of your hospital emergency care system?</p> <p>-Do you provide proper rehabilitation facilities including occupational and physiotherapy for the injured patients?</p> <p>2: In your opinion how important is to train nurses for critical care provision who are regularly dealing with road traffic injuries?</p> <p>-Tell us about any training courses/sessions are being done for the provision of emergency care at your hospital so far?</p> <p>-What are the certification requirements and done by who?</p> <p>3: Do you/or nursing staff know the importance of each episode of care should be documented?</p> <p>-Tell us about the record keeping mechanism of your hospital</p> <p>-Do you think that record keeping mechanisms really helpful for the improvement of emergency care system for road traffic injuries? And How?</p> <p>Now I would like to know about the challenges you face during the provision of emergency care for road traffic injuries and how to address them.</p> <p>1: As a nursing head can you tell us about the challenges/issues nurses face while giving emergency care for</p>
<p>IDI for Head of Nursing and FGD for Nursing staff:</p>	<p>1: As a head of the nursing what are your views regarding increasing number of road traffic injuries?</p> <p>-Can you give us a brief insight/detail about the type of cases you get in your emergency?</p> <p>-Tell us about the number of patients you get related to road traffic injuries (approx.: no per month).</p> <p>2: Do you think that road traffic accidents as an important public health issue and responsible for increasing burden on our health systems and how?</p> <p>-What steps are needed to minimize the burden due to road traffic accidents?</p> <p>3: How many beds are available for the emergency patients?</p> <p>-Do you think that the present workforce meeting the needs of maintaining emergency care for road traffic injuries?</p> <p>-What else is needed to give a better emergency care for road traffic injuries in your hospital?</p> <p>Now I would like to know about your perceptions regarding importance of</p>	

	<p>road traffic injuries?</p> <p>-Do you think in Pakistan trauma related emergency care needs to be revamped?</p> <p>-In your opinion do you think there is a shortage of trained nurses and other health related personnel in emergency departments?</p> <p>-What other problems do you face while giving the care for road traffic injuries in your ward?</p> <p>2: How to address those issues in order to improve the emergency care for road traffic injuries?</p> <p>-Any additional thing you want to add or tell us related to this issue?</p>	<p>which can limit the fatalities related to road traffic accidents.</p> <p>-What can be done to get all the local and regional political leaders together to address this issue?</p> <p>-How to address the prevailing research gap related to the emergency care system for road traffic injuries in Pakistan?</p> <p>Now I would like to know about your perceptions regarding importance of emergency care system for road traffic injuries and different strategies exist in your hospital.</p> <p>1: Do you think by providing effective and timely emergency pre and post-crash care can actually play a vital role in lowering the death toll?</p> <p>-Tell us how lowering the death toll plays an important role in improvement of your hospital emergency care system?</p> <p>-Do you provide proper rehabilitation facilities including occupational and physiotherapy for the injured patients?</p> <p>2: In your hospital for quality trauma care in emergency departments, what kind of strategy exists for the planning, organization and provision of timely emergency care?</p> <p>-Can you tell us about the injury care including triage (allocating aid) for resuscitation and management in your facility?</p> <p>3: As it's a tertiary care hospital and the link between primary, secondary and tertiary centers is essential so what channels are utilized to maintain the communication with other levels of care?</p> <p>-Why it's really important to maintain the communication between the other levels of care?</p> <p>-What can be done to improve</p>
<p>IDI for the Head of the Surgery and FGD for surgical department:</p>	<p>I would like to begin by asking about your perceptions regarding the increasing number of road traffic accidents and its overall impacts on the health systems.</p> <p>1: What are your views regarding increasing number of road traffic injuries? Share your views with us?</p> <p>-Can you give us a brief insight/detail about the type of cases you get in your emergency?</p> <p>-Tell us about the number of patients you get related to road traffic injuries (approx.: no per month).</p> <p>2: Do you think that road traffic accidents as an important public health issue and responsible for increasing burden on our health systems and how?</p> <p>-What steps are needed to minimize burden due to road traffic accident</p> <p>3: Do you think there is a need of making a proper policy for road safety and efforts for reducing the traffic accidents?</p> <p>-Tell us about the efforts or strategies</p>	

	<p>communication with the other levels of care?</p> <p>-What are the strengths of this hospital's emergency care system?</p> <p>Now I would like to know about the challenges you face during the provision of emergency care for road traffic injuries and how to address them.</p> <p>1: What challenges do you face while dealing road traffic injuries on the hospital level?</p> <p>-Do you think in Pakistan trauma related emergency care needs to be revamped?</p> <p>-In your opinion do you think there is a shortage of trained doctors and other health related personnel in emergency departments?</p> <p>-Do you think that instituting of operative trauma care systems, along with proper documentation and record system is a need of an hour?</p> <p>2: How to address those challenges within possible available resources and improve the level of emergency care?</p> <p>What message in particular do you want to give to the policy makers to address this issue?</p>	<p>(approx.: no per month).</p> <p>2: Do you think that road traffic accidents as an important public health issue and responsible for increasing burden on our health systems and how?</p> <p>-What steps are needed to minimize burden due to road traffic accidents</p> <p>3: Do you think there is a need of making a proper policy for road safety and efforts for reducing the traffic accidents?</p> <p>-Tell us about the efforts or strategies which can limit the fatalities related to road traffic accidents.</p> <p>-What can be done to get all the local and regional political leaders together to address this issue?</p> <p>-How to address the prevailing research gap related to the emergency care system for road traffic injuries in Pakistan?</p>
<p>IDI for the Senior Medical Officers/Residents/House officers:</p>	<p>I would like to begin by asking about your perceptions regarding the increasing number of road traffic accidents and its overall impacts on the health systems.</p> <p>1: What are your views regarding increasing number of road traffic injuries? Share your views with us?</p> <p>-Can you give us a brief insight/detail about the type of cases you get in your emergency?</p> <p>-Tell us about the number of patients you get related to road traffic injuries</p>	<p>Now I would like to know about your perceptions regarding importance of emergency care system for road traffic injuries and different strategies exist in your hospital.</p> <p>4: Do you think by providing effective and timely emergency pre and post-crash care can actually play a vital role in lowering the death toll?</p> <p>-Tell us how lowering the death toll plays an important role in improvement of your hospital emergency care system?</p> <p>-Do you provide proper rehabilitation facilities including occupational and physiotherapy for the injured patients?</p> <p>5: In your hospital for quality trauma care in emergency departments, what kind of strategy exists for the planning, organization and provision of timely emergency care?</p> <p>-Can you tell us about the injury care</p>

	<p>including triage (allocating aid) for resuscitation and management in your facility?</p> <p>6: As it's a tertiary care hospital and the link between primary, secondary and tertiary centers is essential so what channels are utilized to maintain the communication with other levels of care?</p> <p>-Why it's really important to maintain the communication between the other levels of care?</p> <p>-What can be done to improve communication with the other levels of care?</p> <p>-What are the strengths of this hospital's emergency care system?</p> <p>Now I would like to know about the challenges you face during the provision of emergency care for road traffic injuries and how to address them.</p> <p>1: What challenges do you face while dealing road traffic injuries on the hospital level?</p> <p>-Do you think in Pakistan trauma related emergency care needs to be revamped?</p> <p>-In your opinion do you think there is a shortage of trained doctors and other health related personnel in emergency departments?</p> <p>-Do you think that instituting of operative trauma care systems, along with proper documentation and record system is a need of an hour?</p> <p>2: How to address those challenges within possible available resources and improve the level of emergency care?</p> <p>-What message in particular do you want to give to the policy makers to address this issue?</p>
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A. Recognition of causes and adverse consequences of road traffic accidents

During interviews, it was reported that enough level of knowledge is not given to the masses. As, one of the participants recalled a memory and told about an incident and how people take this issue for granted.

"I remember when an only son of a famous politician had a massive accident while driving, brought to our emergency. As we were under immense political pressure in order to take all the possible steps to save his life at any cost, which we did, and luckily saved his life. Only in that moment his father who was a political leader as well, realized and regretfully shared that, we have not done enough efforts to spread knowledge about the use of road safety measures to our kids and keep them aware with its adverse consequences" P4-IDI-AED.

It is really very important that Government should do danger spotting on those roads which are thought to be causing accidents. This was suggested by the head of nursing as he said, "Government must identify the danger zones where there are increased chances of having road accidents may be due to its location or whatever cause may be. It should be identified and spotted" P5-IDI.HOD Nursing.

By establishing effective punishment system for rule breaker can be proved useful in order to minimize the incidence of accidents, as administer emergency said that, "In our cities, assigned traffic police officers/sergeants are not performing their duties properly, I would suggest even if they don't do anything but only puncture the tires of motorbikes of who were caught doing fast wheeling, and fine them along with reporting to their parents, then next time surely they will avoid this kind of irresponsible behavior" P4-IDI-AED.

When the accidents happen, there are chances that injured can die before reaching to the emergency ward, so it's important that all levels of care performing their functions according to the set rules and the availability and accessibility of the facilities nearby danger spots must be ensured by the government. "Caring for the injured starts from the scene of accident up to the reaching emergency department of the hospital. Most of the times deaths occur due to three types of cases respiratory suppression, hemorrhages, and foreign bodies. So, these

cases require an immediate first aid or pre hospital care at the scene in order to secure the lives of victims and this can only be achieved if proper pre hospital care mechanism is in place" P5-IDI-HOD. Nursing.

Proper transport system is very important part of the injury prevention during crashes, it can help in lowering the death toll by transporting injured patients to the hospitals on time, surgical intern shared his views regarding the importance of proper transport mechanism that, "Effective timely care for the injured cannot be started until patient is not transported to the emergency ward on time. In our city because of affordability and accessibility to the issues patients lose their lives on the scene or in between the route of incident scene and up to reaching emergency department" P3-IDI-HOD. Surgery.

In order to minimize the fatalities caused due to the road traffic accidents, it is important to make strict licensing policies and ensure the implementation of all the already set rules and regulations. Administrator emergency shared his views in this regard, "Plenty of policies, rules and regulations are already present, but the issue is that these policies are not properly implemented. Most of the traffic personnel get involved in illegal activities like taking bribes from people instead of implementing regulations strictly. It's also Government's duty to ensure proper implementation of the policies" P4-IDI-AED.

Road traffic accidents are considered among the leading causes of death and disability as senior medical officer in emergency department told us that, On daily basis we get a lot of cases which are related to the road traffic accident out of them some are non-fatal with minor injuries while other are fatal with major bone fractures, joint dislocations, skull damages, vascular injuries and other soft tissue injuries. Because of major fractures most of the patients become disable for the rest of their lives and some even become dead due to visceral or neuro related damages" P1-IDI-SMO.

Among the main consequences of road traffic injuries, socioeconomic impacts are worth mentioning. As the senior medical officer rightly described it, "Because of the major accidents a lot victims become disables for rest of their lives and this not only impacts the victim's life but also affects his immediate family as well. As he may be

the only bread winner they had but because of that road traffic injury he became disable and dependent on others. Moreover, any catastrophic expenditure will ultimately push him below the poverty line" P1-IDI-SMO.

The importance of trained staff in emergency department cannot be denied as its very important that trained staff should be present in order to treat injured road traffic injury patients effectively, as senior medical highlighted the importance of the trained staff in emergency, "Yes, training of the staff/all medical care providers is very important and if its present then it can help in improving our emergency medical system including for road traffic injuries" P1-IDI-SMO.

Communication between all levels of care is also considered as an essential part of medical care especially for the injured patients. It was explained by the surgical intern that, "Communication is very important for establishing links between different levels of care, it can be done by proper telephonic communication. Authentic numbers must be mentioned in all health care centers at every level so that communication can be done before referring cases to higher level especially in emergency situations. It is important because any injured who requires an immediate emergency care then through communication with other hospitals timely care be initiated" P2-IDI-SI.

B. Health system challenges for delivering emergency medical services

For effective management of the emergency department the main challenge was to have a proper record keeping and documentation system. It improves the overall functioning of emergency as well as the whole hospital indeed. This was also mentioned by the surgical intern as well, "Definitely, proper documentation system and record keeping mechanism is one the important components of effective management of the hospital including emergency, as it gives us the whole idea about the types of cases. As far as nurses are concerned, they are quite aware of the fact that proper documentation is in their best interest, as it allows them to make negligible medical errors, makes them efficient and responsive while giving care for emergency services as well" P5-IDI-HOD.Nursing.

Effective management of the emergency department can help in earning of the patient's trust on the services which are being provided by the hospitals. Head of surgery mentions it in this way, "When we give timely and effective services to the injured patients with our expert team on board then we can lessen the death toll remarkably. This efficient provision of services not only improves hospital's credibility but also earn the trust of patients in medical care system especially of public sector" P3-HOD.Surgery.

Time factor is very important while treating patients in emergency, as far as service provision for road traffic injuries is concerned, time is the most important factor which decides the fate of injured person. As it was explained by senior medical officer working in emergency department that, "Yes, timely and effective provision of services is very important, as you must have heard of the term "Golden Hour", which is very crucial time period after the crash is happened, and if in this particular time period effective actions are being taken and patient gets required interventions then his life can be saved" P1-IDI-SMO.

One of the biggest challenges for emergency care system in hospital was not having proper security system in place. Head of the surgery shared his experience and emphasized the need of proper security in emergency ward especially, "Security is the major concern for our emergency department, as most of the times our doctors are being attacked or harassed while performing their duties in emergency ward. It completely disrupts our wards functionality and discourage health care providers from performing their assigned duties without fear of being attacked by the patient's attendants" P3-IDI-HOD surgery.

Administrator emergency emphasized on the importance of trained professionals and how they face problems while care giving, "On hospital level no doubt we are doing our best within possible available resources, but still we lack in trained sub specialists like we have good orthopedic surgeons but we need trained vascular surgeons, and especially critical care specialists in emergency department who can improve the functioning of our emergency department" P4-IDI-AED.

On the matter of emergency services at tertiary care hospital, administrator emergency shared that, "We lack

in ventilator facilities for our patients at emergency ward and because of that most of the serious patient get referred to other tertiary care hospitals of big cities instead of getting timely treatment here" P4-IDI-AED.

For proper functioning of hospital management, it is important to have proper reward and punishment mechanism in place, "There is no culture of giving incentives to our health care providers in hospitals nor, there is any strict system for their accountability. In my opinion proper reward and punishment system should be present so that we can monitor and improve overall progress of the hospital" P5-IDI-HOD.Nursing.

From the current study, results advocate that, an integrated trauma system along with improvement in documentation and record keeping system, security for health care providers, provision of timely interventions and training for health professionals is also crucial to be considered for effective post-crash care management at hospital level. So, the importance of building an effective trauma care system, using available professional resources and implementing low cost and evidence-based improvements such as establishing dedicated trauma teams along with proper triage mechanism cannot be denied. Moreover, trauma training for staff (both the nurses and doctors in emergency medicine, critical and trauma surgery) on a regular basis is necessary in order to improve delivery of trauma care at the hospitals. Furthermore, proper security system for health care providers' unavailability of ventilators and lack of Incentives and punishment mechanism were among the main problems identified during this study.

Discussion

Immediate on-the-scene rescue and assistance is vital, especially if emergency care response is absent or significantly delayed. The quality of the first response strongly depends on adequate training to develop necessary skills to render first response this study is also consistent with the previously done research work which identifies the lack of proper scene care as one of the important challenges.⁶ Moreover, single universal access number that is valid country-wide and linked to centralized ambulance dispatch is optimal, simple systems requiring only mobile phones and well-designed protocols can also greatly improve care.^{7, 8} However, few studies which were

conducted in lower middle income country settings stressed on the improvement of facility based trauma care and the availability of all possible resources required for the provision of this care as consistent with this study as well, so, if we work for the betterment of the pre and post-crash emergency services then we can save 1.2 million deaths and 50 million cases of disable persons in the first place.^{9, 10}

Emergency care is delivered in an inherently challenging environment, often requiring providers or dedicated team, to make quick life-and-death decisions based on minimal information.^{12, 13} Many who enter the emergency care profession enjoy the challenging work and the high-pressure environment, and take satisfaction in providing care to patients in urgent need.¹⁴ This study highlighted Coordinating doctors, nurses, and subordinate staff to care for patients requires dedicated teamwork and leadership. This is particularly true in emergency settings where care providers from numerous specialties converge to care for critically ill and injured patients with limited data and under strict time constraints. This study is also consistent with the findings of one of the previous studies, which explains that, emergency personnel especially nurses are vital for the delivery of quality emergency care that is safe, effective, patient-centered, timely, efficient, and equitable.^{15, 17} Moreover, without screening, clients' trauma histories and related symptoms often go undetected, leading providers to direct services toward symptoms and disorders that may only partially explain client screening for trauma history and trauma-related symptoms can help behavioral health practitioners identify individuals at risk of developing more pervasive and severe symptoms of traumatic stress. Screening, early identification, and intervention serves as a prevention strategy.¹⁸ An emergency medical service (EMS) can be effective at reducing losses associated with RTI, by streamlining the chain of survival, effective EMS systems depend upon the prompt transportation of injured people from the scene to the trauma center. It is considered as a major challenge for all health care professionals, along with the various difficult situations related to the life and physical injuries to body can make the decision-making process while giving emergency care difficult. It is important make such efforts which are helpful for injury

prevention and medical care for the victims of accidents.^{19,20}

Conclusion

The importance of building an effective trauma care system, using available professional resources and implementing low cost and evidence-based improvements such as establishing dedicated trauma teams along with proper triage mechanism can be proved as the suitable solution in improving emergency care services for road traffic accidents.

Ethical Considerations

Keeping in mind the safeguarding of dignity, rights and safety of the participants for this research study; informed consent was taken from all of the participants prior to the collection of data. The study was approved by the institutional research board of health services academy Islamabad.

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Views of expatriate Pakistani doctors about quality of medical education in Pakistan

Atif Razzaq Wali¹, Tahir Mahmood Akbar²

¹ Consultant Anesthesiologist, Department of Anesthesiology and Pain Management, Tawam Hospital, Al Ain, United Arab Emirates

² Anesthesiologist and Pain Physician, Department of Anesthesiology and Pain Management, Tawam Hospital, Al Ain, United Arab Emirates

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¹, ² Manuscript writing, compiling data and analysis

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Correspondence

Atif Razzaq Wali
atifwali@gmail.com

ABSTRACT

Introduction and objective: Road Survey to evaluate and analyze the views of Pakistani doctors working in various developed countries about the quality of undergraduate and postgraduate medical education they received in Pakistan and how well it prepared them for their role as senior physicians in a multicultural healthcare workforce in many countries and in terms of parity to the medical education in their current country of work.

Methodology: A web-based survey consisting of twenty item questions with graded answer choices, was prepared by the authors to include a multidimensional comprehensive questionnaire to collect the views of the target participants. The survey was completed anonymously on a mobile device or a computer with internet access and took 5 to 10 minutes to complete.

Results: The results of this qualitative survey indicate that there is generally a broad convergence of opinion regarding the quality of Pakistani medical education, with primary medical education, more consistently considered higher quality, amongst the Pakistani physicians currently working in UK, USA and Middle Eastern countries.

Conclusion: Overall the Pakistani education seems to be of a satisfactory level, but cannot be considered to be superior to the counterpart education from these countries, based on this survey results. Areas such as research methodology appear to be particularly weak and there was a divergence of opinion regarding what the top priority should be to address within Pakistani medical education and training environment. Many of these physicians would like to work in Pakistan again, provided that the working conditions are favorable.

Keywords: Medical education, qualitative survey, education quality

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Introduction

There has been much debate recently about several issues related to the migration of physicians from developing to developed countries. However, few studies have been conducted to address these issues in a systematic fashion.¹

There is little published information about the views of Pakistani physicians regarding medical education in Pakistan. The quality of medical education needs to be examined and compared with the standards of the developed nations. The number of medical colleges

doubled from 1997 to 2005 despite a dearth of teachers, facilities, and teacher training institutions for medical colleges.² Many of the Pakistani doctors argue that, Medical Education needs to change in Pakistan.³ It has been identified by various authors that the medical education in Pakistan may have suffered a decline in some areas. Doctor's profession has long been among one of the most attractive professions in Pakistani society, but doctors are increasingly getting dissatisfied with their jobs.⁴

There is a large number of Pakistani physicians who work abroad which may be linked to the poor quality of job satisfaction and quality of medical education including postgraduate (PG) training. It is reported that 68% of the doctors working in the teaching Hospitals of Karachi are not satisfied with their jobs and female doctors are less satisfied as compared to their male counterparts.⁵ As a result, many doctors choose to leave the country and work abroad. International medical graduates constitute between 23 and 28 percent of physicians in the United States, the United Kingdom, Canada, and Australia, and lower-income countries supply between 40 and 75 percent of these international medical graduates. India, Philippines, and Pakistan are the leading sources of international medical graduates.⁶

In order to successfully practice medicine and pursue a rewarding career in any field of medicine, it is essential that the graduates from Pakistan receive a high standard of medical undergraduate and PG education and training. The medical training standards internationally have recently been highlighting in medical literature. The discourse of the universal global physician calls for a curriculum that is standardized and portable.⁷ The purpose of this survey was to evaluate the quality of the medical education, in terms of how the past graduates find it helped them prepare for their medical careers abroad, where they must demonstrate a minimum level of competence, not only in comparison to the local graduates of that country but also an international body of doctors who would compete for the same positions in the healthcare market.

Sara Bano of Michigan State University, in her chapter "Reverse Brain Drain"⁸ argues that based on statistics, cultural and social reports, there appears to be a trend of many highly skilled Pakistani professionals returning back to their homeland from USA, "Most of them motivated by the idea of making a difference back home, by contributing positively to the society".⁷ To further explore this hypothesis as related to the medical workforce, we also included a question in our survey, about the intention of the participant physicians to return back to Pakistan and if not, the reasons behind their decision. It can be argued that new ideas from these developed countries, about the method and content of medical training can add a fresh perspective with potential for improvement in the

Pakistani medical education environment. Our survey also explores certain areas such as role of research and role of mentors, academic and governing bodies etc. and how this may contribute to improve standard of Pakistani medical education and training.

It seems logical to think that the physicians who have gained experience abroad would be equipped with additional insight that may improve the medical education standards if they return back.⁹ This survey is an attempt to add to the insight and knowledge about the views of the Pakistani physicians who have been living and working in many different parts of the world outside Pakistan, in regards to how they view the Pakistani medical education that they received and how do they compare it to the international standards.

Methodology

Ethical approval:

The study was submitted to Tawam Hospital Research Ethics approval committee for ethical approval and was approved before the commencement of the survey.

Survey Participants:

The participants included are physicians of Pakistani origin, working in various countries across the world. All of the participants are currently employed in various specialties and have completed their PG medical training either from Pakistan or from abroad.

Questionnaire development and distribution:

After a thorough literature research in the relevant online available Pakistani and international journals, 20 question items were prepared by the authors to conduct a qualitative survey. To facilitate anonymity, accuracy and ease of participant use, a web-based software was employed; paid version surveymonkeys.com ©2019. An internet link of the survey was sent to the participants which enabled them to complete the survey on a personal computer or internet enabled smart phone. The authors chose to use the built-in, anonymous response option to ensure the privacy as per the local ethical committee guidelines and the international medical research norms. The survey could be completed between 05 to 10 minutes. The responses were sent directly to the password protected cloud-based program with access

available only to the authors on a single work lap top shared between the authors exclusively.

Data handling and analysis:

The responses were collected through the software paid version surveymonkeys.com® 2019. Given the qualitative nature of this survey the authors studied the individual responses in depth to be able to comprehend and present accurate analysis in qualitative terms, which was more suitable to the nature of this research.

Results

Response rate:

95 physicians agreed to participate and responded to the survey.

Outcomes:

The participants worked in 7 different regions of the world, mainly in United Kingdom (40%), Middle East (45.26%), United States of America (9.47%). A single participant each worked in Brunei, East Africa, Australia and Canada with One participant now moved back to Pakistan (making up 5.26%). The participants worked in various specialties with majority working in acute specialties such as anesthesia (17.8%), medicine (25%) and surgical (22%). Other groups included emergency medicine (6.3%), general practice (21%), psychiatry, radiology and pathology. Majority of the participants had finished basic medical education 20-30 years ago (48.4%), or longer (12.6%), whereas graduates from recent years represented a tiny proportion of the survey participants.

Majority 71% of the participants worked in consultant positions and 3 (3.16%) participants worked as professors in their respective fields. Others worked in service posts and one participant was in a training post. Out of the 95 participants 48.38% had completed some form of postgraduate qualification from Pakistan with majority (32.63%) having FCPS. Just over 51% had not reported to have finished a postgraduate qualification before starting a career abroad. It should be noted that many of participants (but not all) who achieved PG qualification from Pakistan, also achieved further qualification from the country they moved to. 62% of the participants had gained a qualification from their current country of work,

whereas 38% were employed based on their postgraduate qualification from Pakistan. 100% of participants working in USA gained PG qualification from USA (despite some having Pakistani qualification) and 97% of UK participants reported PG qualification from UK. From Middle East region 55% had qualification from Pakistan, 45% reported qualification from abroad but not necessarily from the country they work in with most having UK qualifications such as FRCA, MRCP etc.

When asked the question about, how well did basic medical education prepared these participants for their new role abroad, the majority answered very effective (37.8%), 17.89% replied extremely effective and 29.47 saying it was somewhat effective, with only 12.63% saying it was not so effective and 2.1% saying it was not effective at all. This seems to reflect a high level of confidence and satisfaction amongst the participants in the basic medical education received in Pakistan by them.

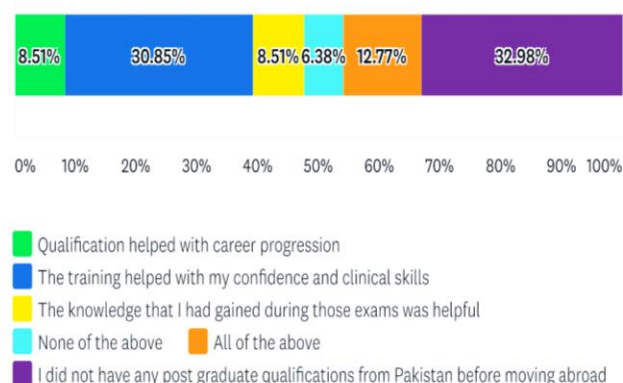


Figure 1: Did the postgraduate training help?

When asked about the participant's views about how the Pakistani medical education compared with the medical education from their current country of worked, overall response was in favor of Pakistan medical education as shown in figure 2, but it varied depending upon location of the responders. Subgroup analysis showed that amongst the UK candidates 43% rated Pakistani basic medical education they received as inferior or a lot inferior to the counterpart UK basic medical education in their view. 16% rated as superior in this group and 41% rated it as just as good. Response of the participants that if postgraduate training helped them at all and in what way (figure 2).

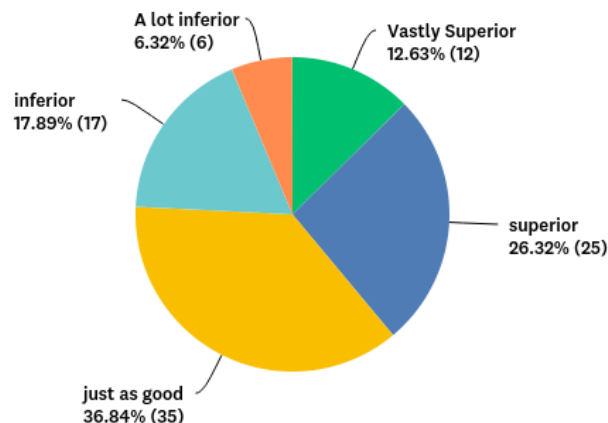


Figure 2: Comparison of Pakistani medical education compared with abroad

Amongst US participants 45% rated it as superior (0% for vastly superior) or just as good (11% and 34% respectively) whereas 55% rated Pakistani basic medical education they received as inferior, but no one rated it as a lot inferior. The group from Middle East region rated as, 18.6% saying vastly superior, 41.8% reported as superior, 34.8% as just as good and only 4.6% reporting Pakistani basic medical education to be inferior quality compared with that of Middle Eastern countries. No one reported it as a lot inferior.

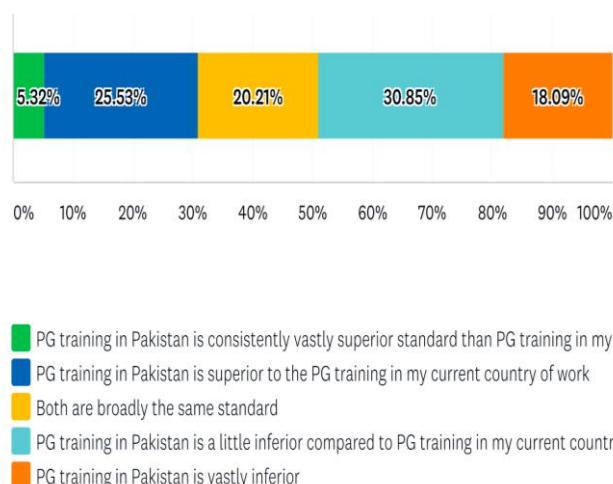


Figure 3: Comparison of Pakistani PG training with abroad

A subgroup analysis was done of the views from the three main groups of participants about their view of the quality of Pakistani PG training and exams. Amongst the UK candidates, 15.79 % reported it to be superior (0% for vastly superior), 18.42% as broadly the same, 42.11% as a little inferior and 23.68% as vastly inferior compared to counterpart training in UK. Amongst the US group. Pakistani PG training was thought to be 25% as same standard, 50% as little inferior compared to US and 25% vastly inferior. No one thought that it was superior or consistently vastly superior to PG training in USA.

The group from middle eastern countries rated Pakistani PG training and exams, as 9.3% reporting consistently vastly superior to the counterpart standards of their current country of work, 41.8% as superior, 20.93% as same standard, 13.9% as inferior to the counterpart postgraduate training, and 13.9% as vastly inferior.

Views of the participants about the quality of Pakistani postgraduate training as compared to the same in other developed countries. When asked about how satisfied the participants were with the quality of education in research methodology during the under graduate medical education in general in Pakistan. 3.1% replied excellent, 4.2% as good and 17.85 as adequate, which makes an overall one fourth (25%) response of some degree of approval of the standard of research methodology that was taught in Pakistani medical colleges at the time when these participants attended medical colleges.

36.8% reported almost nil in reply to this question reporting a total lack of education received in this area and 37.8% reported very poor standard of medical education in the area of research. A further question about standard of research methodology teaching at postgraduate level was asked with a similar pattern of reply as of basic medical education research methodology teaching. 2.13% reported excellent, 9.57% as good, 21.28% as adequate. 52.13% as poor and 14.89% as almost nil. An item question included in the survey asked the participants about their view of the clinical skills achieved after finishing basic medical education. 15.79% replied "excellent for that level", 28.42% as "good", 38.9% reported "acceptable for that level", 12.63% thought that the clinical skills after finishing their basic medical education should be described as "unsatisfactory", 3.16%

chose the response “very poor” and one participant chose the response NA (Not applicable) for unknown reasons.

Table 1: Area in Pakistani medical education needing to be addressed as the top priority

Answer Choices	Responses	
Basic medical education teaching as a whole (1)	24.47%	23
Post graduate training as a whole (2)	21.28%	20
Clinical skills teaching (3)	8.51%	8
Research training (4)	13.83%	13
Training in medical education (5)	4.26%	4
Training in non-clinical skills i.e., ethics, team work, communication (6)	23.40%	22
Other (please specify) (7)	4.26%	4
Total		94

Basic medical sciences and academic teaching was considered the top priority by 24.27%, followed by PG training. Research training and clinical skills teaching were also considerably highlighted by the participants, training in non-clinical skills such as communication, team work and ethics was selected by 23.4%.

When asked if the basic medical education received by the participants reflected good value for money. 91.53% responded yes (including one participant from a private medical college), whereas 7.8% stated it was not good value for money with a 50/50 split between high expenditure and poor quality of education that they received as the reason for them this choice of reply “not good value for money”. In order to estimate the value placed by these Pakistani physicians working abroad, to the importance of basic medical sciences, we asked if in their opinion, understanding of the basic sciences was an asset that helped them pass the PG exams. 80% thought that it was true, and 17.8% disagreed. We were interested to find out, if the participants were inspired by some of their senior clinicians in Pakistan during their training period and looked up to them as role models, 76.8% replied positively selecting the answer “yes”, but 23.16% disagreed.

In order to explore, if there are any regional differences amongst the Pakistani physicians working abroad, regarding their desire or ambition to return back to their home country we performed a subgroup analysis of the participant’s reply to our final question addressing

this area. Following results were yielded. The question asks, “if you were offered the same amount of salary/income as you currently earn, would you consider moving to Pakistan? Everything else like working conditions, country’s political and socio-economic situation unchanged. Majority of the physicians working in Middle East replied in favor of returning back to homeland if conditions are favorable, followed by US and UK groups. Small proportion of physicians was not sure or didn’t show interest to return back.

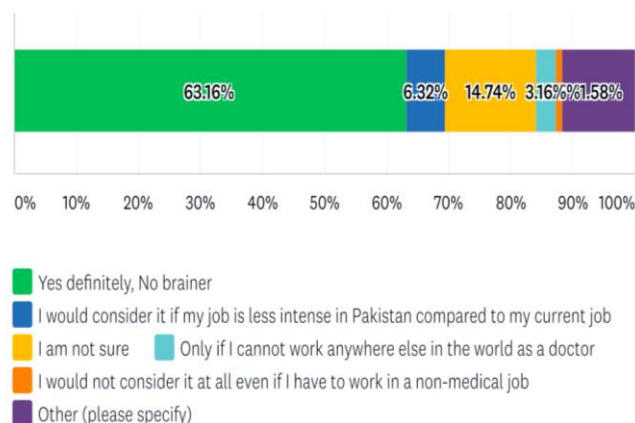


Figure 4: Desire to repatriate

Discussion

As can be seen by the demographic information about the participants of this survey, the participants were distributed in three main regions of the world, United Kingdom, USA and Middle Eastern countries. These are also the developed regions of the world where there is a high demand for highly skilled foreign professionals and the salaries are significantly better with career prospects that may not exist in Pakistan due to lack of investment by successive governments in health care infrastructure, leading to lack of job satisfaction.⁵ The participants were mostly working at senior level in their respective fields, which implies that these participants were all very well qualified to comment on the education system and comparison of the medical education and training provided to them in Pakistan to that of the country of their current residence where most senior doctors are involved in teaching and training of medical students, trainee doctors, nurses and other healthcare workers as well as being involved in research and publication. The participants represented many medical specialties

including the acute medical and surgical specialties as well as general practice, psychiatry and radiology etc.

Most doctors thought that the Pakistani basic medical education had prepared them well to be working at international level. Response of participants about Pakistani medical education compared with the medical education from their current country of worked highlights the possible difference in the quality of basic medical education that our participants observed between the western countries such as UK and USA compared to the standard in Middle East. If one uses these views as a yard stick then it may be concluded based on these responses that the quality of Pakistani medical education lies somewhere between that imparted in USA and UK and that in Middle East countries such as KSA, UAE etc.

Regarding Postgraduate medical education, again most respondents thought that it was helpful in various ways, such as career progression, clinical skills and confidence and adding to clinical knowledge. A subgroup analysis of Pakistani PG training and exams showed that, amongst the UK and US groups, majority labelled it as equal or inferior standards as compared to their countries of residence, whereas majority of the group from Middle eastern countries rated Pakistani PG training and exams as superior or equal to the counterpart standard of their current country of work.

These results are interesting and show the regional differences between the countries where Pakistani physicians are mostly employed outside of the home country. There was a vast agreement between the participants that the knowledge of basic sciences helped them in passing the PG exams, which highlights the importance of emphasis that should be placed on the basic sciences teaching in the curriculum in Pakistani universities and medical colleges. A faculty with a very high professional standing and qualifications should be hired by the medical colleges if the standard of Pakistani medical education has to be brought up to parity level with the developed nations of the world. At the end of basic medical qualification in Pakistan, the medical students are expected to be competent to perform basic medical tasks and must have acquired competencies in the area of clinical skills to be working as a junior doctor. The level of self-satisfaction was explored in this survey through one of the itemized questions and the vast majority responded

favorably that at the end of their training they were either competent at an acceptable level of at a good or excellent level with 16% reporting an unsatisfactory or poor level of competence at the end of their basic medical education.

The rapid changes in medical science compel physicians to keep abreast with the latest developments by gaining an understanding and using scientific principles and methods.¹⁰ It was found through this survey that the quality of medical research within Pakistani basic and PG medical training is not of a high quality. Less than a quarter of the participants placed the teaching of research methodology in Pakistan at an acceptable standard. A strong, therapeutic, and effective relationship is the sine qua non of physician—patient communication¹¹ and many modern medical education systems are geared towards providing teaching in this area, however there may still be a need to improve the standards in this area within Pakistani medical education. The survey explored the views of the participants about what areas needed to be addressed as the top priority and interestingly these seemed to be a higher emphasis on basic science education (24%) and education in non-clinical skills such as effective communication (23%). Others suggested to target PG training as the top priority (21%) and research methodology (13%).

Strengths and limitations:

The strength of this study lies in the target group of participants who have experience and qualification to comment on the research focus. These individuals represent different regions of the world where the medical education is well developed and the traditions of innovation and research are traditionally strong. The participants also represent a heterogeneous group of doctors who work in various fields of medicine and are involved actively in the teaching and training of junior doctors and medical students.

The target participants were the willing individuals from two professional internet-based forums with an exclusive Pakistani Physician membership. This method of identifying and requesting consent to participate in the survey means that the response rate may not be accurately calculable because, the true number of people who would have received the invitation to participate in the survey cannot be known, hence the denominator

needed to calculate the response rate cannot be the whole membership of those forums.

Another potential weakness in this study is that the significant majority of respondents are those doctors who have graduated more than 10-20 years and hence there may be a lack of perspective from the graduates from more recent years.

Conclusion

Medical student's observations of behaviors, specifically those of their role models, are believed to affect learning more than formal teaching.^{12, 13} Research shows that, indeed, as many as 90% of medical graduates remember role models who shaped their professional attitudes.¹⁴ It was explored if the participants were fortunate enough to benefit from the presence of role models within their time in Pakistani medical education system, and 77% of the respondents agreed that they had encountered at least one senior clinician or faculty member who was able to provide a role model for them to derive inspiration from.

Finally, the survey explored if some of these respondents would want to return back to Pakistan if they had a similar level of income and working conditions. Most respondents replied in affirmative however there were regional differences with the highest number from Middle East willing to return back. The regional differences may in part be due to the fact that most of the western countries offer a citizenship to the foreign doctors after a number of years residency and employment in their country, which is not the case in middle eastern countries.

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A pragmatic perspective on mental disorders by psychiatrists of Karachi, Pakistan: A qualitative study

Rehana Khalil¹, Zahid Naeem², Allah Bachayo Rajar³, Uroosa Talib⁴

¹ Assistant Professor, Department of Family and Community Medicine, Unaizah College of Medicine & Medical Sciences, Qassim University, Kingdom of Saudi Arabia

² Professor & HoD, Department of Community Medicine, Shifa College of Medicine, Shifa Tameer-e-Millat University, Islamabad, Pakistan

³ Professor, Department of Community Medicine, Muhammad Medical College, MirpurKhas, Pakistan.

⁴ Head of Medical Services & Consultant Psychiatrist, Karwan-e-Hayat Psychiatric Care and Rehabilitation Center, Karachi, Pakistan

Author's Contribution

¹ Conceived, design and data analysis, review, editing and final approval of manuscript

² Qualitative analysis, assemble data, editing, critical revision, intellectual content.

^{3,4} Data collection, interpretation, drafting, critical revision, import, Intellectual contents, final approval.

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Correspondence

Rehana Khalil

dr.r.noman@gmail.com

A B S T R A C T

Introduction: There is an alarming rise in mental health problems in Pakistan, due to various reasons including genetic vulnerability. There is a paucity of reliable and updated data on mental illnesses in Pakistan.

Objective: The main objective of our study was to explore the perspective of psychiatrists on frequency of mental disorders, their related factors and expected recovery from mental illnesses in a Psychiatric Care and Rehabilitation center of Karachi, Pakistan.

Methodology: This qualitative study was conducted at the Karwan-e-Hayat Psychiatric Care and Rehabilitation center, Karachi, Pakistan from Dec 2019 to April 2020. Seventeen study participants were recruited through purposive sampling and data was collected through in-depth interviews. Qualitative thematic analysis of content was done through generation of a coding scheme.

Results: Analysis of the interview transcripts revealed two main themes related to psychiatrists' views about mental disorders in Pakistan; (1) Contributing and consequential correlates of mental disorders (2) Effective therapeutic strategies and recovery rate from mental disorders.

Conclusion: Our study concluded that mental disorders are increasing with high proportion of psychosis and schizophrenia cases in Pakistan. The productive young age group and male gender are most commonly affected. The factors associated with mental disorders include lower socio-economic status, Low-literacy, divorce, exposure to traumatic events like violence and political turmoil, and sleep disturbances. The recovery rate from mental disorders is promising with integrative approach including pharmacological, psychosocial and care management strategies.

Keywords: Pragmatic perspective, mental disorders in Pakistan, psychiatrist's perspective, qualitative study

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Introduction

Mental illnesses are visibly prevalent all around the world and are globally acknowledged as a crucial social issue which should be aggressively addressed.¹ The spectrum of mental illnesses range from mood disorder to

irreversible disability and even death.² Globally about 400 million people have been stricken by some type of mental disorder during their lifetime and most of them are living in developing countries.³ Mental health is significantly under-

estimated in Pakistan and is a burden on its health care system.⁴ A clinical study⁵ found a large number of psychiatric cases including depression at the top, followed by schizophrenia and substance abuse. This fact is reinforced by a nationwide study.⁶ The reasons behind this huge increase in mental illnesses include unemployment, poverty, violence, political instability besides the genetic and biological vulnerability.⁷

In Pakistan, mental health issues are mostly attended at primary health care settings, so currently available data is not hospital based. That is why, most of the mental disorders remain unrecognized. Other very ignorant factor is timely referral from general practitioners to psychiatrists which is lacking in our country.⁴ The prime goal of our study is to explore the perspective of our experienced psychiatrists on frequency of mental disorders, their related factors and expected recovery from mental illnesses in a Psychiatric Care and Rehabilitation center of Karachi, Pakistan.

Methodology

Setting and Participants:

The study took place at the Karwan-e-Hayat Psychiatric Care and Rehabilitation center (KHPCRC), Karachi, Pakistan. It maintains one of the largest numbers of psychiatric inpatients' in Karachi and consists of three centers including a Psychiatric Care and Rehabilitation Centre at Keamari, which comprises of 100-bed inpatient facility providing treatment and rehabilitation services, an outpatient clinic at Khayaban-e-Jami, and a community Psychiatry Center at Korangi. The three facilities jointly demonstrate step-by-step care through quality medication, therapy, counselling, and rehabilitation. Participants of our study included Psychiatrists with more than 5 years' experience in Psychiatry and working at KHPCRC.

Ethical Approval: The study was approved by the Institutional Review Board (IRB) at Karwan-e-Hayat Psychiatric Care and Rehabilitation center (KHPCRC).

Data collection procedure: A purposive sample of study participants was contacted in their offices and were invited to participate in the study. Potential participants were provided with an information sheet about the

purpose of the study. Those who agreed to participate were recruited for in-depth interviews.

Data Collection and Analysis: Seventeen in-depth interviews were conducted with participants who were cognitively functional and medically stable and had work experience of more than five years. Duration of data collection and analysis was from Dec 2019 to April 2020. A semi-structured, open-ended interview guide was developed which was focused on eliciting psychiatrists' perspectives on mental disorders, related factors and intervention strategies. All participants followed the same discussion guide that allowed comparisons between various responses. Interviews lasted between 45 and 60 minutes. The notes were further expanded immediately after each interview concluded. Qualitative thematic content analysis was performed. A preliminary coding scheme was generated, which facilitated an organized identification of apparent patterns and theoretically important concepts from the data. Minimal demographic information was gathered from the participants.

Information regarding number of patients admitted, frequency of psychiatric illnesses, age-group, gender distribution and daily out-patient clinics was obtained from the medical records of all diagnosed patients, who were already admitted in the hospital at the time of our first interview. They were included in the study by convenient sampling and followed for outcomes for five months (duration of our study) which enabled us to calculate the recovery rate of patients. The patients who were still on treatment after ending our study duration (either still admitted or discharged but getting medicines, counselling or any other form of intervention) were counted as "not recovered".

Results

The sample consisted of 17 participants out of which almost half, 53% (09 out of 17) were working as a psychiatrist for 5 to 10 years, while 35% (06 out of 17) had 11 to 15 years, and 12% (02 out of 17) had 26 to 30 years of professional experience. The mean age of study respondents was 55 ± 10 years, and more than half (10, 59%) of them were female. They were attending 70 to 150 patients per day in their out-patient clinics. There were total 90 patients admitted in the ward at the time of first

interview. Break-up of patients by disorders included 50% psychosis and schizophrenia cases, 32% bipolar affective disorder cases, 14% depression and anxiety disorders cases, and 4% other cases as shown in Figure 1. Seventy-six percent of patients were in the age bracket of 18 to 45 years. Gender distribution of the patients showed male dominance i.e., almost three forth (67%) of the patients were male as shown in Table 1.

Table 1: Demographic characteristics of the study respondents and admitted patients

Study Participants (N = 17)		
Characteristics	Frequency (n)	Percentage (%)
Age (years)		
45-54	8	47.1
55-65	9	52.9
Gender		
Male	7	41.1
Female	10	58.8
Work Experience		
5- 10 Years	9	52.9
11-15 Years	6	35.3
16-20 Years	0	00.0
21-15 Years	0	00.0
26-30 Years	2	11.8
Admitted Patients (N=90)		
Age (Years)		
<18	00	00.0
18 -30	33	36.7
31-45	35	38.9
46-60	10	11.1
61-75	12	13.3
Gender distribution		
Male	60	66.7
Female	30	33.3
Outcome		
Recovered	41	45.6
On treatment	49	54.4
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45-54	8	47.1
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61-75	12	13.3
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Outcome		
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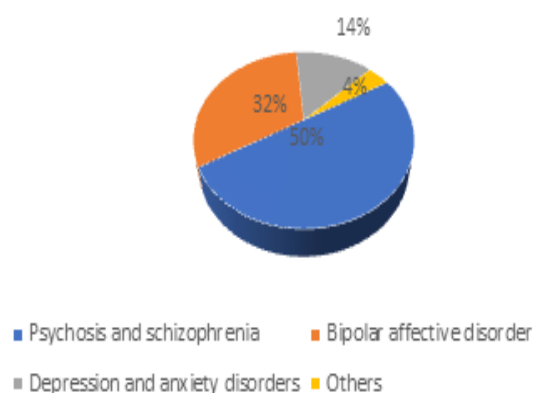


Figure 1: Breakup of patients by disorders

Analysis of the interview transcripts revealed two main themes related to psychiatrists' views about mental disorders in Pakistan; (1) Contributing and consequential correlates of mental disorders (2) Effective therapeutic strategies and recovery rate from mental disorders.

Table 2: Summary of identified aspects

Contributing and consequential correlates of mental disorders	Factors leading to mental disorders	Contributing Factors <ul style="list-style-type: none"> • Low Socioeconomic Status • Divorce • Family issues • Termination of job • Retirement • Illiteracy • Unemployment • Media-induced hopelessness • Violence • Political turmoil • Sleep disorders
	Resulting effects of mental disorders	Consequential correlates <ul style="list-style-type: none"> • Sleep disorders • Bizarreness of dreams
Effective therapeutic strategies	Helpful interventions in use by experienced Psychiatrists for management of mental disorders	Medicines (oral or injectable) <ul style="list-style-type: none"> • Cognitive behavioral therapy (CBT) • Family Therapy • Dialectical behavior therapy (DBT) • Eye Movement Desensitization and Reprocessing (EMDR) • Exposure and response prevention therapy (ERP) • Occupational therapy (OT), and Psychoeducation • Electroconvulsive therapy (ECT) • Counselling support system • Motivational interaction Lifetime morbid risk (LMR) sessions

Theme 1: Contributing and consequential correlates of mental disorders:

Our study participants expressed in detail about factors which may lead to or intensify mental disorders and also the peculiar characteristics which are seen in the patients as a result of mental illnesses. Almost three-quarters (76%) said there is a relationship between mental illnesses and social factors. A variety of factors were offered as the following statements illustrate: "There is a strong connection of social factors with psychosis.

One of them is economic status. Lower financial status is commonly seen in the patients with mental disorders" (R8); "In my opinion, stressful social experiences like divorce, family issues, termination of job, and retirement can trigger mental disorders ranging from depression to psychosis". (R1); "I label Anxiety, depression, phobias and panic attacks as 'Media induced disorders' in our country, as we have a lot of 24-7 news channels which spread negativity and hopelessness among their viewers and most of our people are addicted to those channels". (R4); "Illicit Substance use is one of the commonest causes of mental illness" (R7); "people with lower education level or illiterate are more liable to mental illnesses" (R14); "Unemployment is found to be a common factor among our patients" (R5); "Violence and political turmoil in Pakistani society is responsible for increasing mental disorders" (R6).

Two interesting and prototypical observations about psychiatric patients, were sleep disorders and bizarreness of dreams. One participant explained, "Sleep disorders are potential symptoms of almost every psychiatric illness" (R9). Others said, "To an extent, sleep quality can be a measure of mental health" (R3); "Sleep disorders often coexist with depression, panic disorders, anxiety disorders, Attention Deficit Hyperactivity Disorder (ADHD), schizophrenia, eating disorders, substance use disorder, personality disorders, obsessive-compulsive disorder (OCD) and bipolar disorder" (R11). Most of the participants (70%) agreed that dreaming experiences of psychiatric patients are different from normal people by notifying the following: "Dreams of the psychiatric patients are different from a normal person as psychiatric patients have dreams related to their illness e.g., maniac patient dreams about fame, money etc. others report vivid dreams which are quite scary and thematic dreams related to their psychopathology" (R12); "Some patients have experience of open-eye dreams which are repetitive and fearful" (R2); "Anxiety disorder patients have dreams about loss or threat". "Psychosis patients have dreams about unusual things and superstitious content related to the severity of their symptoms" (R16); "Some of the patients report that they don't see any dream at all" (R13).

Theme 2: Effective therapeutic strategies and recovery rate:

The participants were asked to list down some effective strategies to treat mental illnesses and they showed consensus with the fact that medicines (either oral or injectable) are essential by stating as follows: "Medication for psychiatric patients is very important but once they get stable in a sense that they gain insight and can understand things better than before, they should be referred for psychotherapy sessions along with rehabilitation program. This would greatly help in their speedy recovery" (R5); "Continuing medication with Cognitive behavioral therapy sessions lower down one's chances of relapse" (R2); "Regular use of prescribed medicines are the only way to address a psychiatric problem" (R6). Most of the psychiatrists (12 out of 17) said that psychiatrist patients need life-long medicines while 4 out of 17 reported that medication duration depends on diagnosis and severity of the illness like in depression, psychotherapy without medicines is equally beneficial. Other modes of treatment apart from medication identified by our study participants included the following: "Cognitive behavioral therapy (CBT), and Family Therapy are some modes of treatment we usually prescribe for patients along with medicines" (R9); "Dialectical behavior therapy (DBT), Eye Movement Desensitization and Reprocessing (EMDR), are some very useful therapeutic interventions for psychiatric patients" (R7); "Exposure and response prevention therapy (ERP), Occupational therapy (OT), and Psychoeducation, are proven beneficial for a lot of patients when they gain insight during follow-up and rehabilitation period" (R4); "Electroconvulsive therapy (ECT), Counselling support system, Motivational interaction, lifetime morbid risk (LMR) sessions are used at our institution and they prove to be fruitful for a lot of our patients" (R13); "Psychotherapy, Family Therapy and Day treatment are good strategies among available facilities at our center" (R15).

The participants showed a very positive attitude towards rate of recovery from mental illnesses. Their responses included the following: "Psychiatric patients recover completely if the compliance is good and they regularly come for follow-up" (R10); "Recovery from mental illnesses is promising with medication. Yes! medications will have side effects, but they won't experience all of the possible side effects listed in the

drug warnings, and the side effects they do experience may be worth it for the benefit they receive from the medicine" (R16); "Mental disorders are treatable. No doubt the recovery takes time but the prognosis of mental disorders with treatment is very good" (R17).

Discussion

This study aimed to explore the perspective of psychiatrists on frequency of mental disorders, their related factors, effective intervention and expected recovery from mental illnesses. The present study suggested significantly higher prevalence of psychiatric illnesses (67%) among males as compared to females (33%). A prevalence study⁸ of psychiatric patients reported the similar results in which male patients outnumbered females with 1.2:1 ratio. A study done in Dow University Hospital, Karachi, at its Ojha Campus which is a tertiary care Hospital (2014),⁴ and another hospital-based study done in Karachi (2015),⁹ also showed slight gender difference with male dominance, 51.5% and 51.2% respectively, in psychiatric morbidity. This male over presentation in emergency consultations of psychiatry, cannot be explained on the basis of demographic patterns in the country. It remains ambiguous, whether there are lesser chances of emergency manifestations among female psychiatric patients or this is due to avoidance of their families to bring them in emergency.⁸

Our study found highest proportion of psychiatric disorders among the young age group of 20 to 45 years. Similar findings were seen in the study done by Ayesha Sarwat et al. in 2014.⁴ The diagnostic breakup of our study showed psychosis and schizophrenia were the highest reported cases (50%) in KHPCRC, Bipolar affective disorders (32%) were the second common diagnosis, neurotic illnesses (depression and anxiety disorders) were (14%) ranked third. In contrast to this, depression was reported to be the most common psychiatric disorder, with the rates of 6%, Schizophrenia 2%, anxiety 3% and Obsessive-compulsive disorder was about 7%, by Gadit and et.al in 2007.¹⁰ Ayesha Sarwat et al. in 2014⁴ showed 50% of the patients were suffering from depression, 30.9% patients had anxiety disorders, 29% had psychosis and 24% patients were schizophrenic.

The traditional way of social life in Pakistan is disrupted by factors including growing (disorderly) urban development, unemployment, cultural conflict, poverty and mistrust in state institutions. These factors have significantly contributed in the increased incidence of mental health issues in Pakistan.¹¹ Finding of our study are in agreement with earlier researches^{12, 13, 14} which showed that poor mental health is associated with lower economic status and poverty. Other significant finding of our study includes, high literacy being positively associated with better mental health status, which is in consensus with a study done by Dohrenwend BP et al.¹⁵ One important factor associated with mental disorders is found to be divorce in our study. The impact of marital life on mental health has been studied widely. One's mental health is improved by social security and emotional stability related to marital life. On the other hand, divorced, separated and widows are reported to have higher rates of mental illnesses as compared to the married people.^{16,17} Dominance of modern, urban settings, in Pakistan, aided by the modern media, is leading to an acquired helplessness among people.¹¹ Our data supports association of media-induced negativity with mental disorders. There are 30 news channels in Pakistan and are among highly watched ones.¹⁸ Pakistanis are addicted to news because of exposure to traumatic events like violence and political turmoil. This continuous threat to life and violence has a damaging impact on the psychological health²⁴ of Pakistani society.²⁰ Mental health problems in Pakistan, a developing country, have reached an appalling level in the last few decades^{19,20} which is linked to not only the present-day violence in Pakistani society^{21,22} but disintegration of its social structure as well.²³

Psychiatric disorders and sleep are interrelated in important ways and the lasting viewpoint of this relationship is sleep problems as symptoms of psychiatric disorders, but there is growing evidence in experimental research that the association between psychiatric illnesses and sleep is very complex and it includes a bi-directional causation. However, the risks of psychiatric disorders in people with sleep disturbances are less well-established as compared to the sleep disturbances associated with psychiatric disorders.²⁵ Our findings are consistent with this prevailing viewpoint that sleep

disturbances are generally symptoms of the associated psychiatric conditions.

A considerable literature has been published concerned with the effectiveness and efficacy of a broad range of psychosocial, pharmacological, and care management interventions for treatment of psychiatric disorders and addiction.²⁶ Our study shows that in addition to the pharmacological interventions, other modes of effective treatment for mental disorders include Cognitive behavioral therapy (CBT), Family Therapy, Eye Movement Desensitization and Reprocessing (EMDR), Dialectical behavior therapy (DBT), exposure and response prevention therapy (ERP), Occupational therapy (OT), Psychoeducation, Electroconvulsive therapy (ECT), Counselling support system, Motivational interaction, lifetime morbid risk (LMR) sessions, Psychotherapy, and Day treatment. There are good chances of disability reduction following an integrated psychosocial and pharmacological treatment. Our findings are in consensus with a study done by Vikram Patel et al (2007), which reviewed the evidence on productiveness of strategies for the prevention and treatment of some mental illnesses in middle-income and low-income countries. According to the study, depression can be successively treated in middle-income and low-income countries with low-cost antidepressants or with cognitive-behaviour therapy and interpersonal therapies. Step-by-step care through collaborative models provides a successful framework of integrated treatments which can increase the rates of compliance to treatment. First-generation antipsychotic drugs are found to be cost effective option for treatment schizophrenia and their benefits can be strengthened by psychosocial interventions, such as community-based models of care.²⁷

The recovery rate in our study is found to be 46%. Mental health professionals proposed various definitions of clinical recovery. Its widely accepted definition is a sustained state for a period of two years comprises of complete symptom remission, part-time or full education or work, independent living without supervision by informal careers and having friends with whom activities can be shared.²⁸ Another understanding of recovery discern personal recovery from clinical recovery and it emphasizes on the identity, hope and personal responsibility.²⁹ In the Delphi study comprised of 381

participants with personal psychosis experience agreed that recovery is the achievement of a personally acceptable quality of life and 'recovery is feeling better about yourself'.³⁰ There is only a little evidence about the association between clinical recovery and personal recovery.³¹⁻³⁴ However personal recovery is newer and more acceptable as compared to clinical recovery. There is no epidemiological research to acknowledge how identity development as a person unfolds over time in personal recovery. Therefore, it is scientifically unjustifiable to give a quantitative statement about recovery rates. Those who had tried, have definitely under-estimated, and relatively major under-estimation, of the true likelihood of recovery.

Conclusion

Our study concluded that mental disorders are increasing with high proportion of Psychosis and Schizophrenia cases in Pakistan. The productive young age group and male gender are most commonly affected. The factors associated with mental disorders include lower socio-economic status, Lower-education, divorce, exposure to traumatic events like violence and political turmoil, and sleep disturbances. The recovery rate from mental disorders is promising with integrative approach including pharmacological, psychosocial and care management strategies.

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Flora of Pakistan: An ethnopharmacological perspective

Farhan Shahid¹, Rabbia Shahid², Tanya Waseem³, Shabab Hussain⁴

¹ Pharm. D Scholar, Shifa College of Pharmaceutical Sciences, Shifa Tameer-e-Millat University, Islamabad, Pakistan

² M.Phil Scholar, Department of Biochemistry, Quaid-e-Azam University, Islamabad, Pakistan

³ Instructor, Shifa College of Pharmaceutical Sciences, Shifa Tameer-e-Millat University, Islamabad, Pakistan

⁴ MS Scholar, Department of Biosciences, COMSATS University, Islamabad, Pakistan

Author's Contribution

¹ Literature search

^{2,4} Manuscript compilation & writing

³ Manuscript writing & review

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Correspondence

Farhan Shahid

farhanshahid0076@gmail.com

A B S T R A C T

Ethnopharmacology relies on the knowledge and use of traditional medicinal plants in various human diseases. These plants are a source of nutritional, medicinal and financial support to a greater part of Pakistani population, both in rural and urban setting. Either in the crude form or prepared pharmaceutical formulations, these plants are considered an essential part of the health-care and support system. Being regulated mainly as a part of the Complementary and Alternate Medicine, the plants and their products are used for the treatment of ailments of different organ systems. Their applications vary from being used as tonics, protectants and aids to being used as cytotoxic and antibacterial agents. Pakistan has a variety of biogeographical components which serves as a rich source of medicinal plants. With a deep-rooted history of Unani and Ayurvedic systems in Pakistan, the empirical knowledge about these plants has passed from one generation to the next. Some of these have also been recorded in the historical books of medicine and the components derived from them, now form an essential part of the modern-day pharmaceutical industry. This review provides the information of the flora of medicinal importance acquired from the various parts of Pakistan. The detailed information will help the researchers to develop an understanding about the biological activity and efficacy of phytochemical present in these plants.

Keywords: Ethnopharmacology, therapy, phytochemical, complementary and alternate medicine.

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Introduction

The Islamic Republic of Pakistan is located in the western part of South Asia. It comprises of five main administrative regions stretching from the north to the south as Gilgit-Baltistan and Kashmir, Khyber Pakhtunkhwa, Punjab, Baluchistan and Sindh. There is a diverse climatic variation in these regions.¹ The country enjoys all the four seasons. However, there is a considerable variation in the temperature range and duration of each season.

Pakistan has an agriculture-based economy. Moreover, due to a variety of climatic and biogeographical conditions, the country enjoys a wide floral diversity. A greater part of the population is dependent on plants to derive their nutritional, medicinal and financial

sustenance. Due to the un-availability of basic medical facilities in the far-flung areas, these medicinal plants are used in a variety of formulations including extracts, decoctions, syrups, poultices, lozenges and elixirs. These plants, hence, form an essential component of the health-care system of the country. Due to an ever-changing climatic conditions, there is a constant threat of various biotic and abiotic stress factors to the food crops, cash crops and medicinal plants.^{2,3,4} Efforts should be made to ensure that such threats are addressed appropriately to continue and develop the health care system based on indigenous plants. The current manuscript reviews the flora of medicinal importance belonging to the various regions of Pakistan.

Gilgit Baltistan and Kashmir:

Gilgit Baltistan is the northern most part of Pakistan. The average altitude is 1500m and is a tourist destination in almost all seasons. Health care facilities are scarce especially in far flung areas and doctor to population ratio is alarmingly disproportionate. Due to lack of advance healthcare facilities the use of plants for treatment of various ailments is practiced since ages in the region.

Researchers have reported a number of local plants for medicinal use. The whole plant of *Equisetum arvense* L. (chihly) is used for kidney stones.⁵ *Allium carolinianum* DC. (khush) is used for swellings, dysentery and joints pain.⁶ The leaves and bulbs of *Allium cepa* L. (kashuh) are used as salads and in cooking. Bulbs are chief source of income. Medicinally bulbs are used as aphrodisiac and extract is used in ear pain, flatulence, bacterial infections and skin diseases.⁷ The whole plant of *Allium humile* Kunth (cherum) is used in blood purification and swellings. Similarly, *Allium victorialis* L. (faloon) is used for abdominal problems, swellings, asthma, respiratory problems and dysentery.⁸ The roots of *Asparagus filicin* are internally used for uterine tumors, leucorrhoea, disturbed menstruation and nervous disorders.⁹ The roots of *Polygonatum geminiflorum* (saat Ashee) are used for dysmenorrhea, uterine tumor and swellings. Some people use its roots as general tonic with milk and ghee.¹⁰ *Zea mays* L. (makayi) belongs to family Poaceae and is the second chief source of food and straw. Its grain is also used medicinally for dysentery and cough.¹¹ *Lepidium sativum* L. (zachik) seeds are used in constipation, reproductive problems, uterine tumors and eye problems.¹² Similarly, the neighboring Jammu and Kashmir region, is rich in the local flora that can be exploited for medicinal purposes.

Researchers reported the use of various plants for their medicinal purposes. *Berberis lyceum royle* (kalam), belonging to family Berberidaceae, the roots and stem of which are used to treat dyspepsia, jaundice and sore throat.¹³ *Cassia occidentalis* (talwar phali or kaswandi) is applied on skin externally for treatment of fungal infections.¹⁴ The leaves of *Erenthemum pulchellum* (neeli booti) are boiled with mustard oil and used for cure of blisters and skin cracks.¹⁵ *Jasminum humile* (peeli chambeli) is used for treatment of skin inflammation and ring worm infection.¹⁶ *Myrsine africana* (gugul) is used for

detoxification and its fruit is used as laxative. The leaves of *Lonicera quinquelocularis* (phut) are grinded into powder form then used for healing of wounds.¹⁷



Figure 1: Indigenous trees and shrubs of Pakistan. A. *Rosa indica* (gulab), B. *Eucalyptus regnans* (safaida), C. *Thuja standishii* (mor pankh)

Khyber Pakhtunkhwa:

Khyber Pakhtunkhwa incorporates the northern mountainous regions and the plain regions of north western part of country bordering Afghanistan. Much similar to the Gilgit Baltistan, KP is scarcely resourced in terms of medical and healthcare facilities. The population is mainly dependent on natural remedies of flora of Khyber Pakhtunkhwa.

Accacia arabica (kekar) belonging to the family Mimosaceae, is widely used as wound dressing material.¹⁸ *Accacia modesta* (Palosa) is used as a tonic and stimulant. It is taken with milk and provides instant energy.¹⁹ *Allium sativum* (Ezzah) has anti-hyperlipidemic effect.²⁰ The underground part of *Arundo donax* (kalam) is burned and the resultant ash is used after boiling with water and filtration for diuretic effect.²¹ *Cyanon dactylon* (owshoo) is a simple herb, which is used to treat small pox by grinding it with rice and *Curcuma longa* and also used for the treatment of piles.²² *Dalbergia sissoo* (sheesham) is used as medicine for mental disorders.²³ The fruit of *Eugenia jambolana* (jaman) has got the medicinal property of lowering the blood glucose level thus used as an anti-diabetic agent. Non-edible part of this fruit (seeds) are used in powdered form for gastric problems.²⁴ *Echinops echinatus* (ont katara) is a member of family Asteraceae and is used for the treatment of liver problems.²⁵ Roots and rhizome of *Glycyrrhiza glabra* (mulathi) are used for cold and flu.²⁶ *Acacia catechu* (katha safaid) aqueous extract is used for treatment of diarrhea.²⁷ *Delphinium denudatum* (jadwar) is used as analgesic and anti-rheumatic agent.²⁸

Podophyllum hexandrum (kakora) is a member of family Berberidaceae and is used in the treatment of liver diseases.²⁹ *Sarcococca saligna* (Landanr) is used to relieve the muscular pain.³⁰ *Nasturtium officinale* (Talmera) is very famous due to its use against constipation and stomachache.³¹ *Chenopodium album* (sarmay) is used as carminative and diuretic agent.³² *Hypericum perforatum* (Shin chai), belongs to Clusiaceae and acts as a diuretic agent. Its tea is used as stimulant and also taken as an analgesic.³³ One of the medicinal plant of the family Cuscutaceae, *Cuscuta reflexa* (Zelai), is used for urinary incontinence and taken as antidiabetic and for blood purification.³⁴ *Dioscorea* spp. (kanis) belongs to Dioscoreaceae and is used for the treatment of jaundice and ulcers.³⁵ *Rumex dentatus* (shalkhay) is a member of Polygonaceae and is used for wound healing.³⁶ *Debregeasia saeneb* (Ajali) belongs to Urticaceae family. The leaves of this plant are ground into a paste which is applied on the blistered feet and is also used for eczema.³⁷

Punjab Region:

Punjab is the most populous province of the country. It stretches the lad between KP and Sindh and Indian Punjab and Baluchistan. Basic health facilities are mostly present but a number of people still follow complementary and alternative medicine specialists. They use their ethnobotanical knowledge to treat common ailments.

Most of these drugs are derived from plants. *Achyranthes aspera* (puth kanda) belongs to family Amaranthaceae. Its different parts are used for medicinal purposes, such as in the treatment of kidney problems and cough.³⁸ The leaves and seeds of *Mangifera indica* (Aam) are used to treat earache and vomiting. *Nerium indicum* Mill (Kanhara) is member of family Apocynaceae. The roots of plant are grinded into powder and are used for abortion.³⁹ Arecaceae family has the medicinal plant *Phoenix dactylifera* (Khajur) that is used to decrease the general body weakness.⁴⁰ *Calotropis procera* (Ak) is used in the treatment of asthma.⁴¹ *Aloe vera* (kwargandal) belongs to Asphodelaceae family. These plants are used to treat the rheumatism, body weakness and in the treatment of pimples or acne.⁴² *Artemisia scoparia* (jhahoo) is used as a purgative.⁴³ The seeds of *Carthamus oxycantha* (poli) are grinded into

flour which is used to treat complications associated with ulcer.⁴⁴ The paste of *Eclipta alba* (Sofed Bhangara) leaves is applied to treat allergy, athlete's foot and ringworm. *Rosa indica* (Gulab) is used in treatment of eye disorders and heart disease.⁴⁵ *Citrus limon* (nimboo) belongs to family Rutaceae and is used as toothpowder for dental infections. *Dodonaea viscosa* (sanatha) is used to treat gastritis and skin allergy.⁴⁶ *Datura innoxia* (Datura) is used to treat the gonorrhea.⁴⁷ Dried seeds of *Planago ovata* (ispaghol) is used as laxative and demulcent. *Foeniculum vulgare* (Saunf) belongs to family Umbelliferae and its dried fruit is used as carminative, stimulant and expectorant.⁴⁸ A number of plants also form the basis of many antiviral strategies.⁴⁹

Achyranthes aspera (puth kanda) belongs to family Amaranthaceae. Asthma is treated with the help of plant ash. It is also used for the treatment of skin diseases.⁵⁰ *Digera muricata* (tandla), is used in treatment of constipation.⁵¹ *Agave americana* (kanwar phara) belongs to Amaryllidaceae, Jaundice is treated with the help of plant pulp.⁵² The seeds of *Anethum graveolens* (soy) are given to females for increased lactation.⁵³ *Cannabis sativa* (bhang) is a member of Cannabinaceae family, it is used as an anti-lice agent.⁵⁴ *Calotropis procera* (Aak) is used for the treatment of asthma. It is also used against snakebite and treatment of jaundice.⁵⁵ *Bombax malabaricum* (sumbul) belongs to Bombacaceae family. Its decoction prepared from roots has killing effects on abdominal worms.⁵⁶ *Eruca sativa* (taara mira / jamahoon). It is used to treat constipation and to kill the abdominal worms. Plant oil is widely used as anti-lice agent. Jaundice is also treated with the help of taara mira.⁵⁷ *Capparis decidua* belongs to family Capparidaceae, is used as blood purifier and the twig is used as a tooth stick (Miswak) to relieve toothache and pyorrhea.

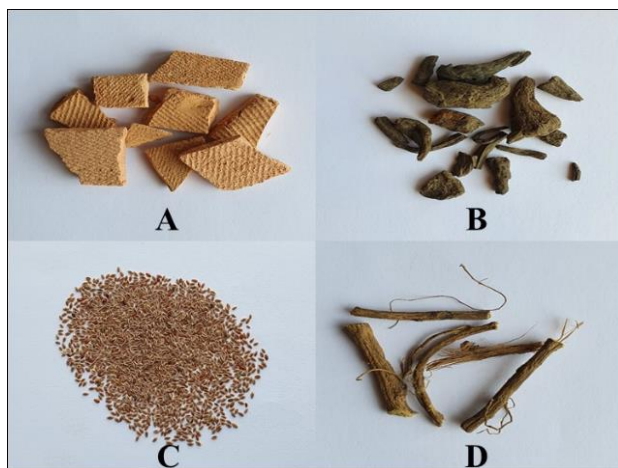


Figure 2: Indigenous crude drugs of Pakistan. A. *Acacia catechu* (katha safaid), B. *Delphinium denudatum* (jadwar), C. *Planago ovata* (ispaghhol), D. *Glycyrrhiza glabra* (mulathi).

Baluchistan:

Baluchistan forms the western most province of Pakistan and is the largest province in terms of land area. Due to the harsh climate and unfertile land, flora of the province is not as diverse in comparison to other areas but the locals utilize available plants and use their ethnobotanical knowledge to treat minor ailments.

Among the various medicinal plants of Baluchistan, *Pimpinella ranunculifoli* (washboo), belonging to family Apiaceae, is used for digestion and is also used to treat heart burn or stomachache. *Stewartiella baluchistanica* (mashlakh) is used as carminative. *Heliotropium baluchistanicum* (daroo) and *Heliotropium ulophyllum* (sag daroo) is used to treat the eye diseases.⁵⁸ The fruit of *Berberis* spp. (karwasakai) is used to treat Snake bite and gynecological problems.⁵⁹ One of the medicinal plant of family Chenopodiaceae is *Atriplex* which is used to treat the skin diseases, as a thirst quencher and for joints pain. *Astragalus khalifatensis* (jib) and *Astragalus lowarensis* are used in colic pain, leprosy treatment and also as an anti-cancer agent. *Berchemia pakistanica* (spera butae) is used in treatment of fever, headache and muscleache.⁶⁰

Sindh:

The southern-most province of the country is Sindh which has a variety of sociological aspects. From extremely under developed regions like the desert of Thar to the cosmopolitan like Karachi, the province's medical and healthcare facilities vary widely.

Abutilon indicum (khangli) is used to relieve the menstrual pain, painful urination and gynecological problems.⁶¹ *Acacia nilotica* (Babool/Desi Keekar) belonging to family Mimosaceae, is used to treat dysentery, diarrhea and vomiting. *Acacia Senegal* (kumbat) is used to treat the burns and inflammation and applied on the skin in the form of a paste.⁴¹ *Achyranthes aspera* (kandii) is used for treatment of abdominal cramps, ulcers and also in vomiting and dysentery.⁶² *Aeluropus lagopoides* (pooji) is used for wound healing and as an analgesic.⁶³ *Aerva javanica* (boo) is used to treat asthma, headache and as a diuretic.⁶⁴ *Aizoon canariense* (Welaiti battar/Dotak) belongs to family Aizoaceae and is used in the treatment of hepatitis and jaundice. *Caesalpinia bonduc* (karbat) belongs to family Caesalpiniaceae and is used in treatment of joints pain associated with trauma and arthritis.⁶⁵ *Launaea resedifolia* (badtar) belongs to family Asteraceae and is used in the treatment of leucorrhoea and jaundice.

Future Perspectives and Conclusion:

The rich diversity of flora in Pakistan and the use of these plants for pharmaceutical purposes calls for the incorporation of modern scientific techniques and procedures to establish the safety and efficacy of these phytochemicals. These plants form the basis of a number of Complementary and Alternative Medicine (CAM) systems. Integration of advanced biological and pharmacological sciences like bioinformatics and pharmacogenomics can help in deciphering the molecular mechanisms involved in the activity of these phytochemicals.⁶⁶ Efforts shall be made to develop the phytochemical based pharmaceutical industry in order to ensure the availability of safe and therapeutically effective medicinal options to a larger population base.

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Bibliometric research productivity analysis: A case study of Shifa Tameer-e-Millat University

Amir Latif¹, Ikram Ul Haq²

¹ Librarian, Shifa College of Pharmaceutical Sciences, Shifa Tameer-e-Millat University, Islamabad, Pakistan

² Librarian, College of Dentistry, King Saud bin Abdulaziz University for Health Sciences, Riyadh, Kingdom of Saudi Arabia

Author's Contribution

¹ Manuscript writing, data collection

² Data investigation, review of manuscript

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Correspondence

Amir Latif

librarian.scps@stmu.edu.pk

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A B S T R A C T

Objectives: This study is aimed to conduct a bibliometric analysis of research productivity of Shifa Tameer-e-Millat University (STMU).

Methodology: Data was collected from online resources from 2012 to 2018. The outcome parameters were the number of publications in each year, document type, scrutiny of the subject area, authorship pattern, research collaboration, frequently used journal and the range of references.

Results: STMU produced 231 documents with frequent references between of 20 to 29. Two-thirds of total publications consisted of original articles and Pharmacology was found to be the preferred area of research.

Conclusion: Research publication is the key element to measure academic performance. There has been a growing tendency in publications over the past three years.

Keywords: Bibliometric, scientific productivity, research, publications.

Introduction

The advancement of knowledge depends on continuing research and enhancing scientific and scholarly communication. Conducting systemic research is an innovative activity to enhance the existing theories and provide a suitable solution to the problems.^{1,2} Medical research has been carried out to discover new treatment of diseases in order to improve the prognosis and quality of life.³ Higher education institutions and universities are known to be the knowledge hub and center of research.⁴ The estimation of research publication output is one of the imperative gauges to assess the quality of education and prestige of the specific institution.⁵ The research publications have been increased manifold during the last decade due to the accessibility of digital resources and the allocation of sufficient finance for higher education.⁶ So, the studies on bibliometric evaluation of literature have also been amplified.^{7,8} Alan Prichard originated the term bibliometric in 1969, which is a combination of mathematics and statistics on books and other published materials.⁹ Bibliometric studies help to find out the least

and most preferred areas of research as well as other attributes of publication output.⁵ These studies are used for the decision-making process and allocation of funds.¹⁰

The research output of the university scientists in the form of research papers in peer-reviewed scholarly journals is being considered as one of the main criteria for assessing the performance of the university scientists and faculty.⁵ Shifa Tameer-e-Millat University (STMU) is a recognized institution for providing education and training to health care professionals and students, located in Islamabad, the capital of Pakistan. It was established in 2012 sponsored by Shifa International Hospital. STMU is paying special attention to hi-tech health care research and is striving hard to increase the quantity and quality of publications. Due to the sincere efforts of the management, it has been seen that scholarly publications have been increasing lately.¹¹

A 2012 study evaluated the publication output in the field of medical sciences by the universities of Pakistan from 2007 to 2010. Twenty-four medical universities

produced 5,889 publications with an average of 1472.25 documents per year and an average of 245.35 documents per university. Karachi University was found to be most productive followed by Aga Khan University and the University of Punjab.¹² Another study indicated that Pakistan produced 38,274 documents from 1996 to 2020 and the share of Pakistan's research output was only 0.32% from the global perspective.¹³ A recent study analyzed the scientometric examination of 4,876 documents created by the researchers of the National University of Sciences and Technology, Islamabad from 2004 to 2018.¹⁴ Iqbal et al. analyzed the research growth of Pakistan from 1981 to 2015. The study revealed that Karachi University emerged as the most productive university and King Saud University of Saudi Arabia was found to be the top priority in international research collaboration.⁶

Sab C. et al. conducted a scientometric analysis of medical research in India from 2009 to 2018 as reflected in Web of Science. A total of 29,153 documents published by Indian medical researchers were reviewed. All India Institute of Medical Sciences arose as the most prolific organization with 2,209 documents and Indian Journal of Medical Research stood at top in journals' rank with 2,158 documents. The study also exposed that United States was on the top with 471,342 publications on medical science during the same period followed by China with 134,685 documents.¹⁵ A 2010 report examined the medical research output by Iranian researchers from 1978 to 2007. A total of 15,487 documents were published by Iran over 30 years with an average of 516.23 documents per year and Pharmacology was found to be a preferred area of research with 2,222 (12.35%) documents.¹⁶ Haq and Alfouzan carried out the bibliometric analysis of 775 publications produced by King Saud bin Abdulaziz University for Health Sciences from 2005 to 2015. Medicine (n=119; 15.35%) was the most opted for area of research and United States was found to be on top priority in international research collaboration.⁵

The quality of research publications reflects the excellence of the institution and the standards of teaching. The current bibliometric study involves the requirement of evaluation of scholarly publications produced by the researchers of STMU and its findings available for the authorities in strategic decision-making

for enhancement of academic and research quality. The aim of the study is to present the bibliometric profile of research publications produced by the faculty of STMU during the targeted period set in the methodology.

Objectives

Following were the objective of the study:

1. To investigate the growth of the research output by the authors of STMU,
2. To distribute the documents by types and by subjects,
3. To assess the pattern of authorship, national and international collaboration, frequently used journals, distribution of journal by country and range of references.

Research Methods

The data was collected using four online data bases including Google Scholar, Medline/PubMed, Scopus, and Web of Science from January 2012 to December 2018. It comprised records of publications of authors affiliated with STMU and its constituent institutions. The study organized the bibliographic information of all the retrieved documents and moved them to Microsoft Excel Sheet for investigation. The bibliometric parameters including number of publications in each year, document type, scrutiny of a subject area, authorship pattern, and research collaboration, frequently used journal along with publications country and number of publications as well as the range of references have been presented in a tabulated form. Following formula¹⁷ has been used to get the annual average growth rate.

$$\text{Annual growth rate} = 100 \frac{(\text{most recent value} - \text{past value})}{\text{past value}}$$

Inclusion Criteria:

All kinds of documents with authorship affiliated with STMU and its constituent institutions published till December 31st, 2018 have been included in the analysis of this paper.

Exclusion Criteria:

The documents which are publishing since January 1st, 2019 and the publications that didn't mention STMU and its constituent institutions as affiliated address have been excluded.

Results

The researchers of STMU and its constituent institutions produced 231 documents during the period of seven years from 2012 to 2018 with an average of 28.87 documents per year as shown in Table 1 and Figure 1. The rising tendency of publications was found with an average annual growth rate of 88.64%. There were only 3 publications produced in the year 2012 and a maximum of 66 documents were found in the year 2018. Furthermore, more than fifty percent of the publications have been published in the last two years.

Table 1: Year-Wise growth of Publications (n=231)

Year	Number of documents	Percentage	Annual growth rate
2012	3	1.29%	--
2013	12	5.19%	300.00%
2014	17	7.35%	41.66%
2015	21	9.09%	23.52%
2016	49	21.21%	133.33%
2017	63	27.27%	28.57%
2018	66	28.57%	4.76%
Average Annual growth rate			88.64%

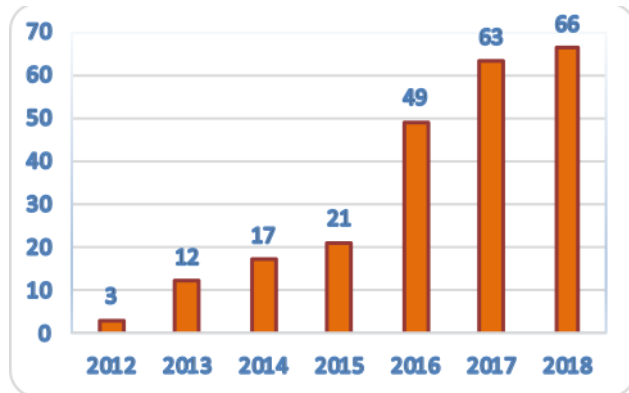


Figure 1: Year-Wise growth of Publications (n=231)

The analysis of document types shows that majority of publications written in the shape of original research articles (n=154; 66.66%), followed by case report/study (n=23; 9.95%), letter to editors (n=18; 7.79%) and book chapters (n=9; 3.89%). The details of other types are given in Table 2.

Table 2: Distribution of Document type (n=231)

Document type	Number of documents	Percentage
Article	154	66.66%
Case Report / Study	23	9.95%
Letters to Editors	18	7.79%
Book Chapter	9	3.89%
Editorial	6	2.59%
Review Article	6	2.59%
Abstract	3	1.29%
Short communication / Report	3	1.29%
Conference Paper	2	0.86%
Erratum	2	0.86%
Survey	2	0.86%
Brief Communication	1	0.43%
Doctoral Thesis	1	0.43%
Paper Poster	1	0.43%

The authors affiliated with STMU carried out research projects on a variety of themes. The subject-wise segregation of documents reveals that majority of research was conducted on pharmacology (n=31; 13.41%), medical education (n=30; 12.98%) and medicine (n=23; 9.95%). Most and least preferred areas of research are listed in Table 3.

Table 3: Subject-wise distribution of documents (n=231)

Subject	Number of documents	Percentage
Pharmacology	31	13.41%
Medical Education	30	12.98%
Medicine	23	9.95%
Community Medicine	20	8.65%
Cardiology	16	6.92%
Neurology	15	6.49%
Physical Therapy	15	6.49%
Genetics	10	4.32%
Ophthalmology	9	3.89%
Physiology	9	3.89%
Surgery	8	3.46%
Nursing	6	2.59%
Pathology	6	2.59%
Oncology	4	1.73%
Orthopedics	4	1.73%
Urology	4	1.73%
Rheumatology	3	1.29%
Biochemistry	2	0.86%
Gastroenterology	2	0.86%
Library Science	2	0.86%
Management Sciences	2	0.86%
Microbiology	2	0.86%

Anthropology	1	0.43%
Dentistry	1	0.43%
Dermatology	1	0.43%
Engineering	1	0.43%
ENT	1	0.43%
Immunology	1	0.43%
Gynecology	1	0.43%
Pediatrics	1	0.43%

A total of 1202 authors, including multiple counts, contributed in writing 231 documents, out of these authors, 554 (46.08%) authors are affiliated with STMU and its constituent institutions. In 128 (55.41%) documents, the principal investigators belonged to the STMU community. Table 4 describes the various authorship patterns being used to compose 231 documents, the authorship pattern of 4 authors was found to be most common followed by 3 authors and 5 authors pattern. Only 16 (6.92%) documents were written by solo authors. Vast majority of publications (n=215; 93.07%) were found to be the result of collaboration among researchers.

Table 4: Authorship Pattern

Rank	Pattern	Number of documents	Percentage
1	4 authors	46	19.91%
2	3 authors	27	11.68%
2	5 authors	27	11.68%
3	2 authors	26	11.25%
4	6 authors	25	10.82%
5	7 authors	24	10.38%
6	Single author	16	6.92%
7	8 authors	15	6.49%
8	9 authors	9	3.89%
10	10 authors	5	2.16%
11	> 10 authors	11	4.76%

Table 5 states the organizational affiliation inside the STMU. A bulk of documents are produced by the researchers affiliated with Shifa College of Medicine (n=131; 56.70%), followed by Shifa College of Pharmaceutical Sciences (n=39; 16.88%), and Department of Physical Therapy (n=17; 7.35%). There is a need to increase the research activities in Shifa College of Nursing, Department of Management Sciences, and Shifa College of Medical Technology.

Table 5: Internal organizational affiliation

Internal organizational	Number of documents	Percentage
Shifa College of Medicine	131	56.70%
Shifa College of Pharmaceutical Sciences	39	16.88%
Department of Physical Therapy	17	7.35%
Shifa International Hospitals	15	6.49%
Shifa College of Nursing	14	6.06%
Shifa Tameer e Millat University	10	4.32%
Department of Management Sciences	2	0.86%
Shifa College of Medical Technology	2	0.86%
Allied Health Sciences	1	0.43%

Table 6 depicts the analysis of international research collaboration, STMU authors collaborated with the researchers of 19 countries in 49 documents. The highest research collaboration (n=20; 8.65%) was found with the authors of United States, followed by UK (n=11; 4.76%) and Saudi Arabia (n=7; 3.03%) respectively. Only one paper was found to be in collaboration with authors of 11 countries each.

Table 6: International Research Collaboration (n=49)

Country	Number of documents	Percentage
USA	20	8.65%
UK	11	4.76%
Saudi Arabia	7	3.03%
Germany	6	2.59%
Canada	3	1.29%
Netherlands	3	1.29%
Malaysia	2	0.86%
Romania	1	0.43%
Spain	1	0.43%
Columbia	1	0.43%
Austria	1	0.43%
Israel	1	0.43%
France	1	0.43%
Belgium	1	0.43%
Norway	1	0.43%
Sweden	1	0.43%
Switzerland	1	0.43%
China	1	0.43%
UAE	1	0.43%

Out of 231 documents, 12 documents are non-journals material consisting of book chapters and a thesis, the remaining 219 documents have been published in 110 journals. There are 84 journals with a single publication each and 11 journals with 02 publications each and 03 journals with 03 publications each. Table 07 describes the list of top ten frequently used journals by the researchers of STMU. Out of these top ten favorite journals, eight are published from Pakistan. The journal entitled "Cureus", published from the United States was found on the top with 31 publications followed by Rawal Medical Journal (n=15) and Journal of the Pakistan Medical Association (n=13) respectively.

Table 7: Frequently used journals

Sr	Name of Journal	Documents	Publishing country
1	Cureus	31	USA
2	Rawal Medical Journal	15	Pakistan
3	Journal of the Pakistan Medical Association	13	Pakistan
4	Journal of the College of Physicians and Surgeons Pakistan	9	Pakistan
5	Journal of Shifa Tameer e Millat University	8	Pakistan
6	International Journal of Rehabilitation Sciences	5	Pakistan
7	Pakistan Journal of Neurological Sciences	5	Pakistan
8	The Professional Medical Journal	5	Pakistan
9	Journal of the Neurological Sciences	4	Netherlands
10	Journal of Ayub Medical College Abbottabad	4	Pakistan

The documents produced by STMU researchers were published in 110 journals published from 20 countries of the world including Pakistan. Almost forty percent (n=91; 39.39%) of the documents were published in 26 journals published from Pakistan. Thirty-one documents (13.41%) published in 16 journals published from United States

while 18 (7.79%) documents published in 18 journals of United Kingdom. Thirteen Indian journals with 16 (6.92%) documents stand on 4th rank.

Table 8: Distribution of journals by country (n=20)

Rank	Journal's geographical address	No. of Journals	No. of Publications	%age
1	Pakistan	26	91	39.39%
2	United States of America	16	31	13.41%
3	United Kingdom	18	18	7.79%
4	India	13	16	6.92%
5	Netherlands	8	11	4.76%
6	Poland	3	5	2.16%
6	Bangladesh	3	5	2.16%
7	China	3	4	1.73%
8	Germany	3	3	1.29%
8	Iran	3	3	1.29%
9	Brazil	2	2	0.86%
9	Malaysia	2	2	0.86%
9	Turkey	2	2	0.86%
9	UAE	2	2	0.86%
10	Nigeria	1	2	0.86%
11	Chile	1	1	0.43%
11	Egypt	1	1	0.43%
11	Saudi Arabia	1	1	0.43%
11	Romania	1	1	0.43%
11	France	1	1	0.43%

The estimation of references used by researchers in all documents counted 5,929 with an average of 26.53 references per documents. There are 11 book chapters and one online published thesis quoted the 959 references with an average of 79.91 references per documents. Almost one-third (n=75; 32.46%) of the total documents have used the reference range between of 20 to 29, followed by 62 (26.83%) documents using 10-19 reference range. More than half (n=137; 59.30%) documents have been following the range of references from 10 to 29. Only two documents used more than 100 references and there were 29 documents with less than 10 references.

Table 9: Range of references in documents (n=231)

Range of References	Number of documents	Percentage
Between 100-200	2	0.86%
Between 50-99	6	2.59%
Between 40-49	12	5.19%
Between 30-39	27	11.68%
Between 20-29	75	32.46%
Between 10-19	62	26.83%
Less than 10	29	12.55%

Discussion

STMU is a newly established general category University, located in the capital of Pakistan, Islamabad. Though the university is relatively new, it has come a long way as far as its publications are concerned. STMU produced only 3 papers in the year 2012 but the document numbers reached 66 in 2018 with an average annual growth rate (AAGR) of 88.64. King Saud bin Abdulaziz University for Health Sciences produced 775 documents in 11 years with an AAGR of 31.66.5 The AAGR of STMU is promising and its researchers used all formats of publications for their research; the majority of documents consisted of original research articles (n=154; 66.66%) and only six review papers were found. A report on Indian medical research productivity for 2009 to 2018 revealed that out of 29,153 documents, 18,477 (63.37%) consisted of original research articles. STMU results have almost resembled in terms of percentage with Indian medical research.¹⁶ The data of the World Fact book revealed that the health expenditure of Iran and Saudi Arabia have 8.1% and 5.7% of their GDP respectively, while Pakistan has allotted only 2.8% of its GDP on health expenditure. It is evident that the sufficient funding on health expenditure helps boost health sciences research in the country.¹⁸

All the documents of STMU have been categorized into various disciplines to view the strong areas of research. Pharmacology, medical education, medicine, community medicine and cardiology were found to be the top five areas of research. The publication growth of any area of research depends on dedicated research team and the supportive administrative environment. The research activities can be enhanced by providing research grant and lucrative incentives to the researchers. An analysis of Iranian medical research output of thirty

years also showed that Pharmacology has been the desired area of medical research in Iran. Authorship pattern of STMU showed that only 16 (6.92%) documents were written by a single author while the majority of documents (n=215; 93.08%) were the result of research collaboration. Four-author collaboration pattern was ranked on the top with 46 (19.91%) documents. Only 16 documents were found with 10 or more than 10 authors. A 5 years' bibliometric study on documents published in Journal of College of Physicians and Surgeons Pakistan (JCPSP) rendered that out of a total of 721 articles published from 2010 to 2014, 128 (26.06%) articles were written in four-author pattern. More than half of the articles cited the references between of 21-30. Medicine, Pathology and Surgery were found to be the top areas of research.¹⁹

There are nine different institutions of STMU that contributed their research in the targeted period, SCM (n=131; 56.70%) exceeded over other departments in the research outcome. STMU has been actively involved with international researchers in creating quality publications, out of all 231 documents, more than one-fifth of the documents (n=49; 21.21%) were the result of international collaboration with 19 countries with United States being on the top with 20 documents, followed by United Kingdom and Saudi Arabia respectively. STMU authors succeeded in publishing their research in 110 journals published from 20 countries of the world. United States' journal 'Cureus' has been on the top with 31 publications followed by Rawal Medical Journal and Journal of Pakistan Medical Association with 15 and 13 publications respectively. Forty percent of research was published in locally published sources while 60% appeared in overseas sources. STMU researchers cited 5,929 references in 231 documents with an average of 26.53 references per document. Almost one-third of the documents (n=75; 32.46%) followed the reference range between of 20-30.

The present study has some limitations which can be addressed in the future. STMU documents can be analyzed on the qualitative aspects e.g. citation impact of publications, most productive author, highly cited paper and impact factor of journals. Further, the research methodologies and role of STMU's authors in research can be assessed.

Conclusion

Medical science is a noble profession and it is the responsibility of all the practitioners to disseminate their scholarly, professional knowledge and findings of experiments for the benefits of the whole humanity through scientific writing. The research publication is the key element to measure the performance of an academic institution. The authors of STMU are producing noteworthy publications with national and international research collaboration. However, there is a need to write more papers on the least preferred areas of research, e.g., dentistry, dermatology, gynecology, psychology, and pediatrics. There is also a need to develop and periodically review research policy to enhance research collaboration both nationally and internationally. Although the growing trend with a rapid steady surge was observed during the last three years still STMU needs to keep this momentum with a dedicated team of researchers.

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A case of ingrown toenail with maggots: A personal experience

Arshad M. Malik¹, Manal Arshad Malik²

¹ Professor of Surgery, Department of Surgery, Karachi Institute of Medical Sciences, Karachi, Pakistan

² MBBS Scholar, Department of Surgery, Liaquat National Medical College, Karachi, Pakistan

Author's Contribution

¹ Manuscript writing, referencing and proof reading

² Synthesis, planning and management of research

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Correspondence

Professor Arshad Malik
arshadhamzapk@yahoo.com

A B S T R A C T

The invasion of the skin and sub-cutaneous tissues with larvae (Maggots) is not infrequently seen in humans. It is basically the flies which feed on living tissues and lay eggs which develop into maggots and start eating the dead tissue. We present a very unusual case of a 35-year-old, mentally retarded man who presented with infected ingrown toenail. The patient had inborn deformity and crowding of the toes. On examination a large number of maggots were found crawling over and coming out from deeper tissues. The wound was explored and treated by excising the tissue alongside the nails with nail removal at the same time. The nail plate excised on the sides and maggots cleared.

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Keywords: Ingrown toenails, infection, complications, maggots, ambulatory surgery, dead tissue.

Introduction

Ingrown nail is not infrequently seen in surgical practice among young population causing severe pain and limitation of routine activities.¹ Its commonly because of inappropriate clipping of nails, use of tight shoes, overcrowding of toes, unhygienic conditions, fungal infection, ignorance, obesity and genetic predisposition.² The ingrown toenail usually passes through stages of inflammation, pain, edema and abscess formation.³ Pain and walking difficulty are one of the major reasons for patients to seek medical advice.⁴ The disease mainly involves the great toe but finger nails may also occasionally get involved.⁵ It is more commonly reported in females.⁶ The incidence of infection in the ingrown toenails is reasonably high. Ambulatory surgical treatment is in vogue currently with cosmetically acceptable results.⁷ Despite and increased rate of infection, there is hardly any case with maggots reported so far in literature.

Case report

A 35 years young, mentally retarded, unmarried man presented with infected ingrown toenail. On examination he was found to have overcrowded toes with a closed front covered shoe. The toe was dressed up and on opening there was massive infection with edema and cellulitis. The tissues on the sides of nail was darkened and few maggots were wriggling inside Figure 1. Preliminary workup was followed by excision of the toe nail. After excision of the nail a large number of maggots were found deep in the tissues lateral to the nail edges and there were pores through which they were coming out on pressing the great toe Figure 2. A wide excision was made with nail bed excised from the sides. The wound thoroughly washed with pyodine and surgical dressing done after securing hemostasis.

Figure 1: Ingrown toenail



Figure 2: Excision of the nail



Discussion

Ingrown toenail is frequently associated with pain and can be secondarily infected requiring surgical treatment.⁸ A number of anatomic and habitual factors are reported to

be the risk factors such as improper and inadequate trimming, repeated trauma, genetic makeup and poor foot hygiene.⁹ Great toe is the most common victim but occasionally fingers can be affected with prevalence at its peak in second and fifth decades.¹⁰ We report a case of a young, mentally retarded man who presented with infected, unilateral ingrown toenail with maggots crawling in the infected wound. Despite being a common condition, maggots are not reported in the ingrown toenails. This is a unique case which indicates that ignorance can lead to a worsening of the condition and the treatment then demands an extensive tissue removal to ensure clearance. We treated the patient under local anesthesia and removed the nail and found maggots crawling underneath. Deeper dissection was done and the lateral nail plates excised. The wound is being dressed after toilet with pyodine.

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Impact of the human genome assignment on biology and generation

Sumreena Mansoor¹, Almas Ashraf²

¹ Associate professor, Department of Biochemistry, Shifa College of Medicine, Shifa Tameer-e-Millat University, Islamabad, Pakistan

² Instructor, Department of Biochemistry, Shifa College of Medicine, Shifa Tameer-e-Millat University, Islamabad, Pakistan

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² Manuscript proof reading

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Correspondence

Sumreena Mansoor

sumreena.scm@stmu.edu.pk

A B S T R A C T

The Human Genome Project has revolutionized biology by deciphering a reference human genome sequence along with many other organisms' complete sequences. The project reflects a great example of integrated inter-disciplinary approach to develop sophisticated technology and brought engineers, computer scientists and mathematicians at one platform with biologists. Further improvements have made from projects ENCODE, to find functional elements of genome; and Human Proteome Project, to map human proteins through the genetic map. Moving one step ahead, the gaps that were present to study evolution of many species are now decreasing due to better understanding of the genome. There has been an open approach to data sharing and open-source software, thereby data is publicly accessible for more breakthroughs from data banks such as GenBank. Physicians approach to practice medicine is changing and becoming more personalized as a result of this project. There has been development in treatments of many diseases for example through genome-wide association studies. Diseases prognosis and risk can be now more accurately predicted through the advancements in HGP. However, we are still in initial stages and in the process of understanding the huge data generated by HGP and its implications. Moreover, the ethical, social and political issues that arise due to this genetic research needs to be addressed alongside.

Keywords: Human genome project, proteomes, genome-wide association study, gene mapping.

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Introduction

Human Genome Project:

The Human Genome Project (HGP) has played a key role in transforming the fields of biology and medicine. Initially, most of the biologists were against the idea of human genetic mapping and it was favored more by the US congress and the US Department of Energy (DOE) than scientific community.^{1,2} The project started in 1990 and its data was published in 2004.³ It all started with first generation sequencing which was slow and cumbersome.⁴ For improvement, Craig Venter created 'Celera' to decipher the sequence using bacterial artificial chromosome (BAC) vectors which expedited the project.⁵ For more accuracy, smaller genomes such as yeast were mapped before mapping human genome. HGP fostered

the advancement in mathematics, computers and statistics for handling the analysis of large amount of data generated by this research project. Scientists produced accurate genome data for each chromosome with very small gaps.³ These reference sequences paved the way for further studies involving gene transcription and regulation.⁶

Influence on Biology:

The Human Genome Project was released with the intention to map the parts of complex biological system at molecular level in order to understand their connections, dynamics and functions.⁷ For instance in 2003, the project by NIH called ENCODE (Encyclopedia of DNA elements) was initiated, that aim at finding the functional elements of

the genome. Various techniques including the second-generation sequencing were used to yield massive data linked to regulatory networks that control gene expression.⁸ This played a pivotal part in the emergence of “Systems Biology”.

Furthermore, the HGP also paved the way for the proteomics.⁹ Human Proteome Project (HPP) is mapping human proteins through a genetic map.¹⁰ However, it is challenging project to accomplish due to cell type specific, spatial and temporal nature of protein expression and its functions.^{11,12} The completion of HPP and greater understanding of proteins, will lead to precise diagnostic, prognostic, therapeutic, and preventive medical applications.¹³

Through human genome project initiation, approximately 4000 sequences have been identified, of humans and other species mostly of bacteria.¹⁴ It has given an insight of how microbes and humans are connected, about their lineage and trace steps of evolution.¹⁵ Moreover in future, it will help in understanding of how new genes are formed, reorganized, homology of sequences among species; the list goes on. One of the most interesting discovery was the collection of the Neanderthal genome. A minor percentage of common genetic-code between Neanderthal man and humans suggests crossbreeding between the two species during their evolution.¹⁶

Influence on Technology:

The HGP led to the advancement in technology especially in computation and mathematics that created a common platform for biologists, physicists, engineers, mathematicians and software experts.¹⁷ HGP also focused on the idea to make the availability of this knowledge accessible to the public by user friendly data banks for example GenBank at the UCSC (University of California Santa Cruz) Genome Browser.^{18,19} In addition, the HGP also promoted open-source software, that provides the source code of programs which can then be edited according to the needs of researchers and scientists.²⁰ Physicians can access this data cloud and use it for personalized medicine in future that will change the practice of medicine and greatly contribute to the next generation of health systems.

In 2010, Human Proteome Project introduced a gene-centric approach to map protein expression from every gene locus.²¹ HGP has facilitated quantitative mass spectrometry for reference sequences and value of masses of peptides in human proteome. Mass spectrometry-based proteomics technology has given platform to new applications like targeted proteomics.²² HGP also requires precise computational resources, like Peptide Atlas and Trans Proteomic Pipeline.^{11,12}

Influence on Medicine:

Human Genome Project has led to several advancements in medicine. For instance, many common single nucleotide polymorphisms (SNPs) have been identified in various human communities.^{23,24} Furthermore, new SNPs, both common and rare, are being discovered every day that provide a high-resolution map of genetic variation among humans.²⁵

Information has also been generated through genome-wide association studies (GWAS), which associate targeted genetic variants to risk of a disease through case control studies and statistics.²⁶ This GWAS approach has modified the prognosis and treatment of various diseases such as multiple sclerosis, age related macular degeneration and Parkinsons.²⁷ Since 2005, over 1,350 GWAS have been published.²⁶

With thousands of exomes and whole-genomes sequenced, it will be easy to identify disease causing variants and we will be able to establish strong relationships between structural differences and precise phenotypes. The perfect case is of using large scale data for analysis of different cancer types.²⁸ As expertise grows with information and techniques, it will be possible to clearly pinpoint the underlying mechanism of diseases as well as to identify and quantify the risks of different diseases. Patients and healthy adults will be able to see the pattern to predict the occurrence of disease or to track its prognosis. They will be able to modify and improve their own healthcare through prevention or personalized therapeutic strategies which have been based on their genome sequence.²⁹

Influence on Society:

HGP has forced scientists to think about its ethical consideration almost at every step with social implications from the initiation of the project to the succeeding projects

in genetics. Around 5% of their budget was allocated for the social, ethical and legal aspects of human genome sequence research.³⁰ This process will continue as bioethics is an integral part of research. Ironically, biologists are unable to identify any race or cast related genes in humans but based merely on ancestors interbreeding and migration.³¹

The concerns of this research and its implications are valid for one as the impact can be huge. Firstly, it includes privacy and fairness in the use and interpretation of genetic information such as questions of ownership and control of genetic information. Secondly, fair use of this information for insurance, employment, criminal justice, education, adoption, and the military will be necessary. Moreover, reliance of genetic technology to make right decisions by individuals on issues of their health will influence them for rest of their lives and maybe even their off springs. So, to question the effectiveness and reliability of genetic research is importance as that; do we even have enough evidence to make certain decision or not. This further highlight and question how knowledgeable the health professionals are, because they have a huge influence on the decision that patient make. Then, the use of genetic research by the third party for commercialization of the products from human genetic research. Examples are questions of the ownership of tissue and tissue derived products, patents, copyrights, and accessibility of data and materials. It can be further disturbing, if using this facility to tweak human genomes without knowing the consequences, for instance to enhance intelligence or strength.

How far we have come?

Despite innumerable opportunities in research and huge application of human genome project, basic question of how to respond to this nebulous information remains a challenge.³² We are still in the learning phase of many processes. The quality of testing may be unreliable and the level of quality control of different genetic laboratories might vary. Many therapies based on genetic discoveries are still in process of clinical trials and their results might not correlate as predicted.³³

However, the advances made by human genome project cannot be ignored. There have been advancements in approach to medicine. Clinical practice

has been shifted to precise, predictive and personalized medicine.²⁹ Each individual can predict their risk linked to certain diseases. As each individual genome can be mapped, the treatment and progress of each individual can be personalized according to his/her requirements.

Few decades ago, there were many challenging questions which can be answered now. For instance, determination of three dimensional structures of proteins or link regulatory mechanisms at molecular level; or discovering gene products like RNA and proteins that are essential for life, and whether these ingredients be used to synthesize organisms from scratch or how components of a cell interact or can we develop our own computer model of a cell, a life? And most importantly, will we be able to accurately reconstruct the history of human populations and evolution of life on Earth?

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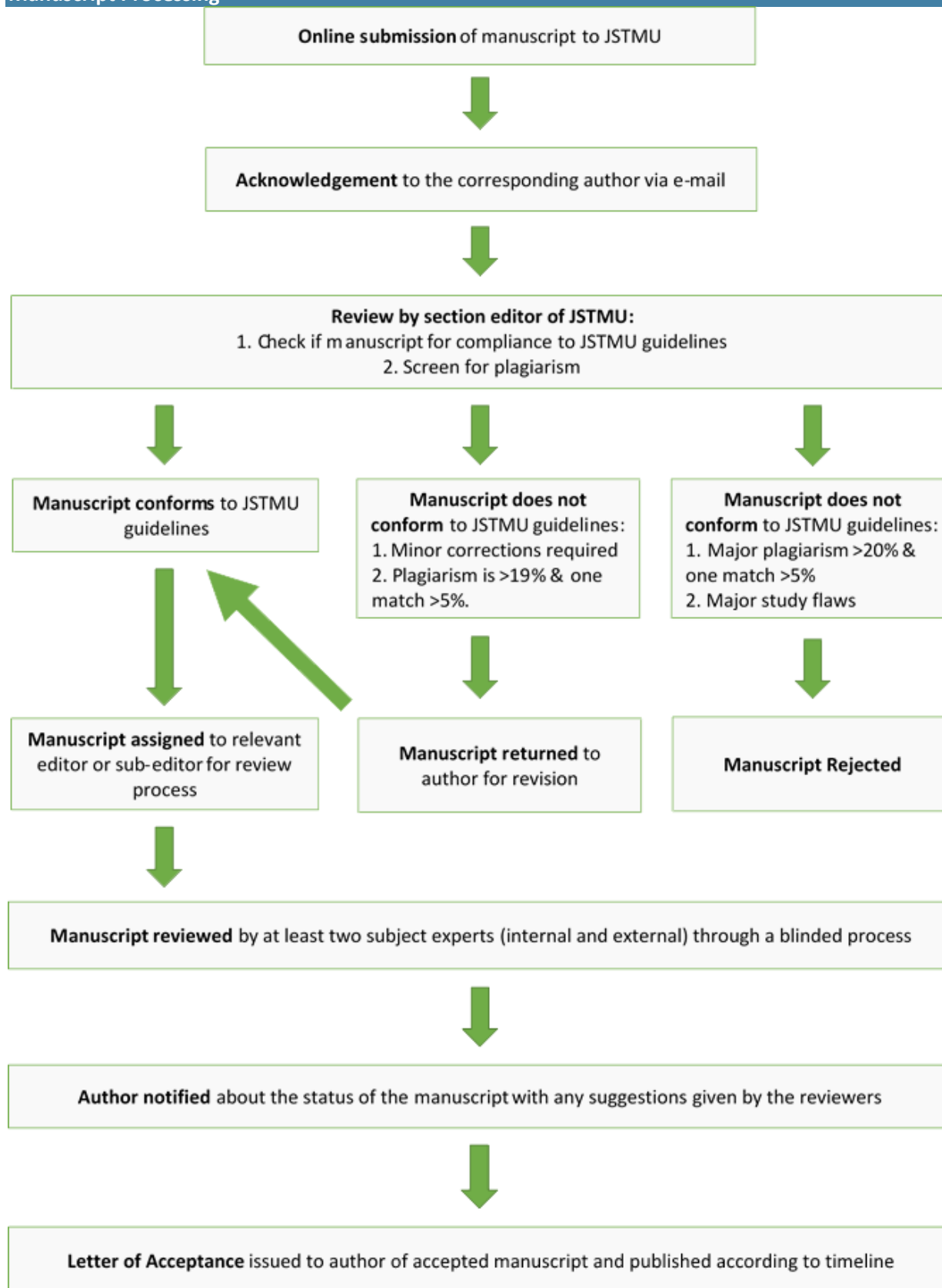
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Initial decision to review	1-2 weeks after submission
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Each original article must contain:

Title page *

Title page should contain the following information:

1. Complete title of the article
2. Name(s) of author(s)
3. Department(s)
4. Institution(s) at which work was performed
5. Official phone/fax number, mobile phone number, personal e-mail address of the corresponding author, and institutions address.

Abstract

The abstract should be structured and NOT more than 250 words. The abstract must be written under the following subheadings:

1. Introduction
2. Objectives
3. Methodology
4. Results
5. Conclusion

Text

Text must be arranged under the following headings:

1. Introduction
2. Methods
3. Results
4. Discussion
5. Conclusion(s)
6. Acknowledgements (if any)

Introduction: Should provide brief review of relevant literature in such a way that it highlights the importance of the study and that the purpose of the study should be clearly stated. The articles used in the review of literature should be properly referenced by Vancouver Style.

Methods: Should include the setting(s), the subjects (participants), sampling methods and sample size, if used, type of study design used, and other procedures that were conducted. The Methods section should be brief, crisp and detailed enough to enable the reader to replicate the study in another setting. Commonly used procedures and methods need not be described but require a reference to the original source.

Results: Should include the factual findings of the research study done and, presented in the form tables or figures. Each table and figures should be properly labelled with headings and numbers (e.g. Table

No. 1, Figure No. 1) on separate pages. The write-up of results in the text should highlight the important findings without duplication of presentations displayed in the tables or figures. *Explanation of the findings should be reserved for the Discussion section.*

Discussion: Should highlight the important findings comparing and contrasting the study's results with that of other similar researches published and it should be appropriately referenced. Discussion should be concise and supported by the presented data.

Conclusion: Is restricted to the study and is drawn from the results and discussion.

Acknowledgements: If any, should be placed at the end of the text and before references.

References: *

References should be cited consecutively in SUPERScript as NUMERICAL without parentheses and should appear AFTER the punctuation marks (., ; : ? ! " etc.) in the text/sentence. The final bibliography should be in the order in which they are quoted/cited in the text and written in Vancouver Style.

Citation Example:

Equal amounts of dietary carbohydrates have variable blood glucose response considerably as a function of specific food ingested.¹

Bibliography/References Example:

1. Wolever TMS, Yang M, Zeng XY, Atkinson F, Brand-Miller JC. Food glycemic index, as given in Glycemic Index tables, is a significant determinant of glycemic responses elicited by composite breakfast meals. *Am J Clin Nutr* 2006; 83(6):1306–12.
DOI: <https://doi.org/10.1093/ajcn/83.6.1306>

B. Meta -Analysis/ Systematic Reviews

Meta-analysis are systematic, critical assessments of literature and data sources pertaining to clinical topics, emphasizing factors such as cause, diagnosis, prognosis, therapy, or prevention, and that includes a statistical technique for quantitatively combining the results of multiple studies that measure the same outcome into a single pooled or summary estimate. All articles or data sources should be searched for and selected systematically for inclusion and critically evaluated, and the search and selection process should be described in the manuscript. Inclusion and exclusion criteria must be mentioned. Details of searching articles and search engines used should be clearly stated. The specific type of study or analysis, population, intervention, exposure, and tests or outcomes should be described for each article or data source. These should be described in the Method section. The data sources should be as current as possible, ideally with the search having been conducted within several months of manuscript submission. Authors of reports of meta-analyses of clinical trials should submit the PRISMA flow diagram and checklist. Authors of meta-analyses of observational studies should submit the MOOSE checklist. Follow EQUATOR Reporting Guidelines. The text **should NOT exceed 6000 words** excluding abstract, references, tables and figures.

Each of the sections of these articles should include specific sub-sections as follows:

Structured Abstract: (Not exceeding 250 words):

1. Objectives
2. Methodology
3. Results
4. Conclusion

Text should be organized under the following headings:

Introduction:

1. Rationale
2. Objectives
3. Research question

Methods:

1. Study design
2. Participants, interventions, comparators
3. Systematic review protocol
4. Search strategy
5. Data sources, studies sections and data extraction
6. Data analysis

Results:

1. Provide a flow diagram of the studies retrieved for the review
2. Study selection and characteristics
3. Synthesized findings

Discussion:

1. Summary of main findings
2. Risk of bias
3. Limitations
4. Conclusions

** For all other information including title page, typing and reference style, please follow the original articles instructions.*

C. Systematic Review (without meta-analysis): Review articles

Systematic Reviews/ review article are critical evaluation and assessments of scientific literature and other sources of data relating to health sciences topics, emphasizing factors such as cause, diagnosis, prognosis, therapy, or prevention. Systematic Reviews without meta-analysis are published as Review articles; those with meta-analysis are published as Original Investigations.

Systematic Reviews should include the following:

1. Abstract (Unstructured abstract of no more than 350 words)
2. Introduction (150-250 words)
3. Methods (150-250 words)
4. Results (1000-1250 words)
5. Discussion (1000 words)
6. Conclusions (2-3 sentences)

Maximum length: **Should NOT exceed 3500 words of text** (not including abstract, tables, figures, acknowledgments, references), with no more than a total of 5 tables and/or figures and no more than 50-75 references.

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D. Case Reports/Case Series

The journal will consider only those case report/series that represent very rare case(s), or epidemic diseases that are new or emerging, or first observation(s) of some emerging phenomenon or disease. They should have clinical significance and may also include observation of new adverse effect(s) of a drug, vaccine, or procedure or other unique observations, etc. Informed written consent of the patient or next of kin (if patient is not alive or comatose/disabled) should be obtained before submission of the manuscript. A covering letter from the authors that convincingly describe the merits of the case in the light of the mentioned criteria and it's educational or scientific merits should be sent along with the manuscript.

Case Report /case series should contain a single paragraph abstract and text **should NOT exceed 1000 words** (excluding abstract, references, tables and figures) with maximum 10 bibliographic references and either three figures or three tables. Each case report must contain:

1. Abstract (unstructured - should not exceed 120 words)
2. Introduction
3. Case Presentation
4. Discussion
5. Conclusion
6. Competing interest
7. Patient consent

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E. Rapid/Special /Short Communications

Rapid/Special/Short communication should be complete work, such as COMPLETE results of a short RESEARCH study, NOT a preliminary report and **should NOT exceed 1500 words** with one figure and/or one table. An editorial decision will be provided rapidly without reviews.

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Letters **should NOT exceed 400 words** of text and 5 references, 1 of which should be to the recent article. It should not have more than 3 authors. The text should include the full name, academic degrees, and institutional affiliation for author and the email address for the corresponding author. Letters considered for publication shall be forwarded to the author of the cited article for possible response. The editor reserves the right to shorten these letters, delete objectionable comments, make other changes, or take any other suitable decision to comply with the style and policies of the journal. For writing and references style, follow the same instructions listed above.

Letter in Reply

Replies by authors should not exceed 500 words of text and 6 references. They should have no more than 3 authors.

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The topics of the editorial are decided by editorial board and/or Editor-in-Chief. Editorial is written either by one member of the editorial board or some expert on that topic invited by the Editor-in-Chief. As a convention, the editorial addresses relevant areas of interest that may pertain to a range of areas influencing health and health care sciences.

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