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## Research and reporting

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**Keywords:** Research, reporting, medical writing

Research is indispensable for the growth and development of all disciplines, particularly medical sciences which fundamentally need continuous research and progressive innovation. The aim of any research should be 'solving of the unsolved' and adding up innovative expertise for the better clarification of scientific challenges. The real need of the society must be kept in mind while planning, devising and conducting research [1]. Only applied and translational research can serve this purpose. The challenges faced by the practicing physicians today are to provide update and cutting-edge care to their patients by incorporating the valid new information [2]. In order to ensure high- quality care and best practices, sound guidelines are developed based on recorded and transparently assessed clinical experience. Translational research (enabling the practical application of scientific discoveries to develop and implement, new ways of prevention, diagnosis and management of disease) has entirely changed the outlook of medical practice leading to notable progress in health care systems. Similarly, research has a colossal impact on human health and longevity of life, and that contributing to the national economy in addition to the individual benefits of improved health. To boost societal interest, the research must be robust and placed on fast track to answer the unanswered [3].

Writing and reporting scientific discoveries is an important outcome of a researcher. The scientific reporting on discoveries is important for society to improve health care through the advancement of knowledge beside a researcher's career growth. Scientific writing is a challenging task, and a mind-numbing process to crop up appropriate structure and style, expressing

subjective intellectual discoveries. Structuring and phrasing of research findings require appropriate training. Though Plentiful literature is available on scientific writing and reporting, beside hands on training programs on preparing scientific manuscripts. Nevertheless, there is no straight answer to the question; 'what constitutes a good paper worthy of publication'. We do not find foolproof rules in the literature guaranteeing success in publishing a manuscript. Even good scientific contents of a manuscript alone do not promise its publication in a good journal [4]. Mostly, editors and reviewers appreciate manuscripts that are easy to read and to edit beside valuable scientific contents. The art and science of medical writing requires; understanding of the concerned project, the purpose of reporting, approval process, a correct literature search strategy, adequate language skills, formatting, understanding and presenting research data, editing and publishing requirements. All data require presentation and interpretation, including tables and graphs which should be self-explanatory reflecting research design [5].

While constructing a manuscript, information must be truthful and complete including negative findings, taking care copyright laws, avoidance of plagiarism, following authorship criteria for research manuscripts, and the policies of journal must be respected at all cost.

Medical writings have significantly improved in past two decades resulting in increased number of medical journals and quality of reporting. Although, over six million medical articles are published yearly, yet quality of these articles published, even in the most prestigious journals is questionable. A vast majority of these articles is either clinical case series or clinical trials. The clinicians are encouraged to adjust their practices according to the

guidelines determined through trials, a gold standard evidence for defining usefulness of interventions. The clinicians and policymakers thus make sound evidence-based decisions for the adjustment of practices and health care choices. All studies need to be approved by Institutional Review Board (IRB) - a committee of independent physicians, statisticians, social scientists and representatives of the community, established to review, approve and monitor all research proposals including clinical trials. IRB regulates the ethical considerations, rights and welfare of the research participants, validates the worth of the study and ensures that the risk should not override the benefits. Based on purpose of writing, we can divide medical writings into: editorials, original articles, review articles, case reports, short communications, letters to the editor, personal views and special communication [6]. Thus, a writer takes personal responsibility of providing a valid, reliable, and well-defined information to the readers. Published research findings serve as basis on which clinical actions can be planned and implemented. Therefore, learning the art and science of medical writing is paramount for all teachers, scientists and academicians.

Once research findings are ready to be reported, a researcher makes an educated choice, as to where to get it published. Every researcher desires to get his work published in a high impact factor journal (Measuring the frequency and number of citation of a journal/manuscript). A high impact factor indicates that research findings published in journal are considered highly influential. All peer review journals while accepting for publication look for accuracy, novelty and ethical methodology of the research and ensure that manuscripts selected for publication certainly contribute to advance knowledge and improve health care of the masses [7].

With stirring zeal and drive, the "Journal of Shifa Tameer-e-Millat University" (JSTMU) is being launched and a dedicated team of editors, advisors and reviewers has been appointed to facilitate the researchers who wish to publish in JSTMU. We at Shifa, strongly believe that soon it will be among the most respected journals of health care fraternity.

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# Physicians' and Nurses' perspectives on the importance of advance directives in tertiary care hospitals

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## A B S T R A C T

**Objective:** This study aimed to explore and identify the nurses' and physicians' views about Advance Directives and identified their perspectives on its importance, in the context of Pakistan.

**Methodology:** Using a purposive sample, six physicians and seven nurses from two tertiary care hospitals in Karachi participated in the study. Data was collected using semi structured interviews that were transcribed verbatim. The interviews were coded and categorized manually. Analysis of the data drew four categories: roles of physicians and nurses in the End of life care, challenges they faced while taking end of life care decisions; their perspectives about Advance Directives, and the scope of acceptability of Advance Directives in the context of a Pakistani society.

**Results:** This study revealed that patients' families and physicians usually take decisions for patients' End of Life care. Although majority of participants acknowledged the usefulness of Advance Directives, they explicated several issues that may be encountered in implementing it. The issues included non-disclosure of diagnosis to the patient in Pakistani culture, the tedious legalization process involved, and the potential problem of forged documents.

**Conclusion:** Participants recommended establishment of Palliative Care services before execution of Advance Directives. This study indicated viability of Advance Directives; however, a wider exploration would be required in terms of study population. Reforms to support this concept would be required in systems, structure, legal policy, and training of Health care professionals. Besides these transformations, promotion of public education about the advantages of Advance Directives could enhance their acceptability among the general population.

**Keywords:** End of life care, Pakistani, advance directives, perspectives

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## Introduction

Worldwide, advancements in health care technology have been directed towards elaborative and futile treatments instead of PC for the terminally ill. Futile treatments refer to the provision of continuous medical or surgical treatment to the patient that may defuse the symptoms of the disease without curing it. They may lead to overtreatment and cause misery to the patient, and thus burden the family and society [1]. Because of these aggressive treatments, nearly two million people in

America are restricted to nursing homes and nearly 30,000 patients are surviving in comatose or permanently vegetative states [2, 3]. In Pakistan, families may exhaust their financial resources for the treatment of their loved ones, without considerable results.

The issue of futile treatment can be curtailed through ADs. ADs refer to the individual's expression of wishes about the type of treatment that they wish to receive when they become incompetent to make decisions [4]. ADs

have legal standing and it could be exercised in the form of a living will, health care proxy, or a durable power of Attorney. The living will is a directive in which individuals leave instructions about the extent of their treatment. Power of Attorneys and health care proxies, authorize a surrogate decision maker to take decisions on their behalf should they become incompetent to do so themselves [4].

In the absence of ADs, health care providers, especially physicians and nurses, face difficulties when confronted with the patients' EOLC decisions as they may be compelled to prolong the patient's life, but without quality [5]. Worldwide, especially in the western countries, ADs are currently used for the medical treatment of patients. As early as 1991, 93% of the outpatients in the US desired ADs [6]. Although the concept of ADs originated from USA, the need for ADs has been realized worldwide [7]. Research in the Asian countries, such as Thailand, Japan, and Malaysia suggests that ADs could be a useful strategy to overcome issues related to futile treatments, but according to a number of researchers certain modifications would be required to make it culturally relevant [8, 9, 10]. However, to the best of researcher's knowledge, the concept of ADs remained unexplored in Pakistan. Therefore, this study was designed to explore physicians' and nurses' perspectives about the importance of ADs, as they are the key stakeholders in the healthcare system.

As a healthcare professional working for a tertiary care hospital in Pakistan for fifteen years, the principal investigator had the experience of observing the plight of patients, and relatives in ICU, where use of gadgets like ventilators, Bipaps, etc., has led to delayed and miserable deaths, instead of making it a peaceful, natural process. The incumbent financial burden was also substantial causing families to lose most of their savings for the treatment of their loved ones who, in most cases, remained in a vegetative state before death.

The aim of this study was to explore the physicians' and nurses' views about ADs and to identify their perspectives on the importance of ADs in the context of Pakistan. It specifically aimed to answer the following questions:

1. What roles do the physicians and nurses play in the EOLC?

2. What challenges are faced by physicians and nurses related to the EOLC decisions in tertiary care hospitals?

3. What are the views of physicians and nurses about the importance of ADs?

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## Methodology

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An exploratory descriptive design was used to seek a comprehensive understanding and deep insights of a phenomenon [11]. A purposive sample of thirteen participants including physicians and nurses with a minimum experience of two years in critical care areas were recruited from two tertiary care hospitals in Karachi. One of them was private and the other was a charitable hospital. A diverse group of subjects was recruited to ensure variation in demographics of the study participants. This sampling strategy was used to obtain cases deemed information rich for the study purpose [10].

Data was collected through semi structured, in-depth interviews with probes to elicit the participants' verbal responses and non-verbal cues. Semi structured interviews permit flexibility to express ideas and thoughts liberally and help the researcher obtain enough data on preferred themes. The participants expressed their views either in English, Urdu, or bilingually. The interviews were transcribed verbatim by professional transcribers. Approval was obtained from the Ethical Review committee of both the hospitals before data collection.

Concurrent with the qualitative research approach, data analysis was done simultaneously with the data collection [12]. This strategy helped in identification of data gaps in the responses of the participants. Transcripts were verified with the recordings to acquire an in-depth understanding before synthesizing the data. Responses of participants to each question were collated. Relevant words, phrases and sentences were highlighted for coding both latent and manifest ideas and similar codes were grouped for sub categories and categories. The analysis process was overseen by the research supervisors.

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## Results

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There were nearly equal number of participants in terms of profession and their work experience ranged



from three to thirty years and only three participants had formally learnt about ADs.

The analysis obtained from the interviews was organized into categories and subcategories as are explained below with excerpts from the participants' interviews.

**Table 1: Categories and Sub-categories of the findings.**

Categories	Sub-categories
Roles in the EOLC	Care provider
	Counselor
	Decision Maker
Challenges in the EOLC Decisions	Disagreements in decision making
	Financial Issues
	Distributive justice
	Communication issues
	Quality of Life (QOL)
	Dealing with family care givers
Perspectives about ADs	Awareness about ADs
	Advantages of ADs
	Potential implications of ADs
Potential scope of acceptability of ADs in Pakistan	By self
	By loved ones
	By society

### Roles in the End of Life Care:

Three roles were quite apparent for nurses and physicians such as that of a care provider, counselor, and decision maker. Analysis revealed that the most common role adopted was of a decision maker. Majority of the participants shared scenarios about decision making where the family was involved in decision making for the terminally ill patients. Physicians in the non-paying hospital viewed themselves as independent decision makers and usually informed the family about the decision.

"End of life care decisions in the ICU are not patient-family decisions. If the families have specific concerns, we take them into consideration but these patients are in critical conditions and decisions should be taken by the health care teams."

This quote reflects that the family is not always considered capable of decision making and it is the physicians' prerogative to decide.

Most nurses felt that decisions were mainly made by doctors, in consultation with the family, and these views came from the non-paying hospital.

"We are not directly involved in the care decisions; it is the family and the doctors who decide."

However, the ICU nurses of the paying hospital facilitated decision making related to the continuity of care, but it was dependent on their individual knowledge and experience.

"Fifty percent role is played by the nurses in the EOLC decisions. When the consultant takes his decision in the ICU setting, the nurses' input is valued considerably because they are the primary care givers."

### Challenges in End of Life care decisions:

Several challenges in the EOLC decisions were identified by the participants, such as disagreements in decision making, financial issues, distributive justice, communication issues, patient's QOL, and dealing with family care givers.

The participants identified that multiple stakeholders are involved in the decision making, whose interests, responsibilities, and perspectives vary to a significant extent, which, in turn, complicates the decision-making process, as one participant explained,

"The patient's son in Karachi had already signed for DNR with pharmacological support. So, the patient was put on T piece. After 7-9 hours in this state, the other son arrived from Dubai...., he created a chaos, and said that the code status be changed to full code. So, this was a challenge; the decision taken in the presence of one son was changed by the other son, who was more powerful and, thus, demanded to revert the decision"

All the participants referred to financial burdens faced by the family. A physician explains,

"A woman had cancer and they kept treating her and eventually she died. Her husband had to sell his house and everything. If, at the end, the yield is so small and the economic devastation is great, we need to discuss finances, looking at the extreme expenditure of the patients".

Some participants highlighted the issue of limited resources and its implications on distributive justice. In their view, due to lack of resources, decision to continue treatment for one patient would mean denial of care for the others.

A scenario when the code status was undecided,

"The ventilator was occupied for three days on a terminally ill patient, and she finally expired in the ED...someone else could have benefitted from it and survived, but that family was not convinced"

Most participants identified ineffective communication as a challenge and were concerned that information given to the patients and families was inadequate, inappropriate and delayed. A nurse said,

"Counseling should start with the diagnosis of a terminal illness, but it doesn't happen. When things start getting worse, and then the counseling starts. At that time the patients' and the families' become resistant."

Many participants shared scenarios where life was prolonged, with a decline in the QOL where patients were kept alive in vegetative states. An intensivist shared,

"A 20-year-old woman devastated from a road traffic accident was paralyzed from below the neck, with severe encephalopathy. She had a bed sore which went all the way down to the sacrum... and she decompensated and yet the family said, 'do everything.' This patient had no life ...but the family wanted everything to be done."

### **Perspectives about ADs:**

Most participants had awareness regarding the concept of ADs. In line with the existing literature many participants in the current study described ADs as patient's own wishes about the care and treatment in terminal illness. The idea that prevailed was an expression of autonomy.

All the participants had knowledge about ADs and understood that it's a legal document, but a few perceived

ADs to be only for the terminally ill. For instance, a physician asserted that,

"ADs are legal documents and should be made for patients who are bed bound, those with terminal illnesses, and cancers".

Some of the participants understood that there could be a surrogate decision maker. As a nurse explained,

"The patient can make another person responsible to take a decision on his behalf it can be his son or daughter".

The participants recognized that ADs would have several benefits which would minimize the challenges at the EOLC. They expressed that with ADs decision making for the terminally ill will become easy, there would be equity in resource allocation, and would ensure QOL. Some of the participants expressed that PC services are needed in our country and they should be established before ADs. A physician stated,

"It's going to take time; like in the western countries, they did not jump to ADs.... one can approach it from another angle; we can set up PC services and then ADs could follow"

The analyses highlighted some implications that must be considered. The participants anticipated that a thorough legal mechanism, infrastructure, and mass education would be required. There would be hindrances due to the paternalistic culture, where the disclosure of diagnosis is limited to the family. A physician articulated,

"It's like a big elephant in a room [issue] nobody wants to talk about. Many a times, I have family members who come to my clinic even before the patient, and would say, 'my mother should not come to know about the diagnosis.' So, that is a major challenge in our culture, and it does not give us the opportunity to discuss ADs."

Moreover, concern regarding the possibility of forging of documents was expressed, due to which stringent legal laws need to be in place. A physician expressed,

"A country where the judicial system is a joke and there is no legal system to tell what is right or wrong. Anybody can write, 'this patient does not want to be resuscitated', and get it signed and then how will I challenge that in the court of law. It can be used against me."

### **Potential scope of acceptability of ADs in Pakistan:**

All the participants in this study were in favor of ADs for themselves. Most of them had expressed their ADs informally to their friends or family. A nurse said,

“God forbid, if something happens to me and I am dying, then do not unnecessarily prolong my life. I have told my friends about this.”

Most of the participants were in favor of discussing with their loved ones about their decision in conditions of terminal illness. Some participants expressed that they would prefer life sustaining treatments for their loved ones only if their prognosis would be good. Talking about her mother a nurse explained,

“It will depend ... what her co-morbidities are, and whether she requires ventilation for a reversible condition, I would go for it. But, God forbid if it is an irreversible condition, then I would not opt for intubation.”

This response implied that participants had a misconception that ADs are limited for the terminally ill patients.

Nearly half the participants expressed that ADs are a positive step in healthcare, a nurse stated,

“I guess, once ADs are introduced ... people will accept them. The responses may not be good initially, but when people will realize that the patient can die peacefully by having an AD, they will accept it.”

Most participants believed that the acceptance of ADs would be proportional to the level of education. A physician stated,

“In our country, with such a low literacy rate, people will not understand the concept of ADs but among the educated families it would be accepted.”

A nurse administrator revealed that ADs are being implemented, but usually it is the family who makes the decision when the patient is terminally ill. She elaborated,

“ADs are being implemented, like people express that we don’t want to go for support. It is being done for oncology patients, but there is no policy. ... So, we have started with the critical patients, but it is informal.”

Some participants were of the view that if a renowned hospital takes the lead in implementing the policy, it will be readily accepted and other hospitals would follow. A nurse said,

“If the policy of ADs could be initiated by internationally affiliated hospitals, like AKUH, whose services are availed by more educated and literate patients or consumers, the chances of its acceptability will increase.”

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## **Discussion**

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The two main roles discussed by most participants were of a decision maker and a counselor. It was found that the physicians usually made the EOLC decisions in collaboration with the families, but the patients were not involved most of the time. Comparing the views on ADs from different cultures findings corroborated with our results, that in Asian cultures, end of life (EOL) decisions were made by physicians and families, whereas, in the Western culture decisions were usually made by the physicians and patients [14, 15].

The most commonly discussed challenge was disagreements in decision making due to multiple stakeholders and their varying interests and accountabilities. Previous studies have also referred to these issues; such as differences in family and medical decisions, within the family, among medical teams, and between family and patient opinions [16, 14, 17, 18]. Another challenge, faced by the nurses and physicians, was financial constraints of the families of the terminally ill. This finding corresponds with the available literature [19, 20, 21, 22]. The existing literature has identified distributive justice as one of the consequences of life sustaining treatments in the terminally ill [23, 24, 25]. Similarly, it was also highlighted in the current study, as in a country like Pakistan if scarce health care resources are used on the terminally ill, salvageable patients are denied care.

In line with the existing literature, the participants in the current study described ADs as patient’s own wishes about the care and treatment in terminal illness [8, 26, 27, 28, 29]. These phrases reflected the principle of autonomy. A few participants had limited understanding of ADs as they thought that ADs could only be prepared for the terminally ill and many were not aware about proxy decision making. This was due to the lack of education about ADs. This study, therefore, necessitates that continuing education workshops be conducted for raising

awareness about ADs which corresponds with the available literature [9, 7].

In the participants' view, the main advantage of ADs was that decision making could be easier, as the onus of responsibility would be on the patient, instead of family members or HCPs and same has been expressed by participants in another study [26]. Participants identified ADs to be advantageous in terms of QOL as they focused on quality, rather than longevity of life. Another acknowledgement by the participants was equity in resource allocation, which was also consistent with other studies [23, 24, 25]. Thus, the use of ADs would benefit the patients and the health care organizations.

With regard to the implications of ADs, the participants expressed concerns about law enforcement in Pakistan. The process of legalization was highlighted by the physicians, who asserted that there should be a thorough legal process. A study contradicted the findings of the study and maintained that ADs should be used as guidance for decision making in EOLC, but should not be legally binding [17]. The difference in the opinions of the studies may be explained by the fact that one study was done in Portugal, where the judicial system is stringent, whereas, the existing study was conducted in Pakistan, where the judicial system is malleable and not so rigorous. Another concern was the issue that these documents could be forged and used to suit the relatives' wishes and later be used against them (physicians). A similar finding was revealed in a German study, where participants expressed their fear that relatives could abuse such documents [31].

Corresponding to the studies in Japan, Taiwan and Thailand, the participants of the current study reported that non-disclosure of diagnosis created hurdles in exploring options for ADs with their patients [8, 30, 10]. In contrast, the studies about ADs conducted in the western cultures emphasize that diagnosis and prognosis should be discussed with the patients to make informed EOLC decisions [32]. The reason for the difference was the population, and their cultural differences.

Similar to the studies conducted in the western world the participants of the current study unanimously favored ADs for self and others in this era of technology [33, 17]. However, studies conducted in other Asian cultures did

not hold favorable response for ADs [8, 9]. Similar to the findings in a study, the participants of the current study believed that discussion with loved ones about their ADs would be helpful [34]. Contrary to the findings of studies in other eastern cultures, the acceptance of ADs among HCPs in this study appeared to be higher. With regard to implementation of ADs in Pakistan, participants verbalized that this concept will gradually gain social acceptance and popularity. Moreover, the participants reported that ADs would be readily accepted if reputable hospitals would take the lead in implementing them.

This study generated data for further research on ADs. In addition, it even provided an opportunity for the participants to read about the concept and reflect on their perspectives about the importance of the phenomenon. Although this study indicates viability of ADs in the context of Pakistan, the participants were limited to thirteen nurses and doctors from two hospitals in Karachi. To gauge the acceptability of this concept among the general public, broader surveys of the population and HCPs are needed.

On the basis of suggestions from the participants and the analysis, some recommendations have been set forth for health care organizations and HCPs. Health care organizations and the government need to realize the importance of ADs in this era of advance technology. A policy regarding ADs should be made, after legal approval, at the government and institutional levels. Furthermore, health care institutions must include the concept of ADs and PC in their curricula. As part of continuing education, sessions for physicians and nurses must be arranged on ADs, EOL communication, and PC. In order to implement ADs, PC services need to be established first. Awareness on the concept of ADs for the general population must be created in conjunction with health education for chronic and terminal illnesses.

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## Conclusion

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Although there are difficulties and intricacies associated with the introduction and implementation of ADs, the execution of this concept in healthcare is a necessity. HCPs need to be educated and trained in relevant skills to implement this concept. This study indicated that the idea of ADs is viable in Pakistan. However, a broader exploration would be required with a



wider population. Moreover, a detailed exploration is required for the feasibility of ADs in terms of systems, structure, and legal policy needed to support this concept. Nevertheless, informal implementation of ADs to a certain extent is currently being done and public education could enhance their acceptability among the general population.

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# Awareness among medical students in Islamabad and Rawalpindi regarding use of anti-bacterial soaps: A cross-sectional study

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## A B S T R A C T

**Objective:** The objective of this study was to determine the knowledge, practices and attitudes of undergraduate medical students about anti-bacterial soaps and hand sanitizers.

**Methodology:** This was a cross-sectional study conducted with the help of a self-designed, validated online and paperback questionnaire. The questions were based on knowledge, attitudes and practices of students regarding antibacterial soaps and hand sanitizers.

**Results:** A total of 474 students participated in the study. Majority of the students preferred medicated soaps (55.7%) and hand sanitizers (41.6%) for daily use and considered these products to be superior to regular non-medicated soaps and hand sanitizers. Television commercials (61.8%) were the most common source of information about these products. Medical students found it important to further increase the use of medicated soaps for better protection against disease causing microbes.

**Conclusion:** Majority of the study participants were conscious about hygiene and hand sanitization because of interaction with patients. Moreover, most of the students perceived medicated soaps and hand sanitizers to be effective for protection against disease causing microbes under the influence of media marketing campaigns.

**Keywords:** Medicated soaps, hand sanitizers, medical students, hygiene

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## Introduction

In recent years there has been a substantial rise in the demand of unregulated over-the-counter (OTC) consumer products like soaps and hand sanitizers containing antimicrobial ingredients with intent to minimize bacterial contamination [1, 2]. According to the results of several studies, such products containing antimicrobial active ingredients have failed to provide significant difference on germ protection as compared to regular soap and water [3, 4]. This issue becomes more complicated when antibacterial products market employs aggressive marketing strategies to attract consumers as media

reports about emerging lethal infections make general population vulnerable to widespread advertising tactics.

The hazardous effects of antimicrobial ingredients used in medicated soaps and hand sanitizers have been investigated in a number of studies which have reported that widespread use of such products can disrupt composition of gut-associated microbiome and cause different diseases [5, 6]. Besides antimicrobial resistance, other potential adverse effects such hormonal disruptions, harmful effects on developing fetus, environmental bioaccumulation, ecotoxicity and carcinogenicity have also been associated with the use of such products [7, 8,

9, 10, 11, 12]. Recently, FDA has issued a warning against the use of different active ingredients in OTC health-care products without prior permission and has made it mandatory to establish scientific data regarding the safety and efficacy of such products keeping in view the large amounts of different metabolites being found in waste water which is ultimately contacted by humans [13, 14].

Considering the gravity of the situation, some attempts have been made to investigate molecular basis of all these effects but there exists limited data to educate the general population about collateral damage caused by these antibacterial products. If medical students and medical professionals have adequate knowledge about rational use of these products, it would become easier to convey this to the general population. With this background, aim of this study was to determine the knowledge, practices and attitudes of undergraduate medical students about anti-bacterial soaps and hand sanitizers and their harmful effects in different medical colleges of Islamabad.

## Methodology

This was a cross-sectional study and conducted at Shifa College of Medicine, Islamabad after obtaining the Institutional Review Board approval. The sample size for this study was 500 students. The sample technique used for the study was random sampling. The questionnaire was self-designed, validated and distributed both online and in paperback to many medical students across cities of Rawalpindi and Islamabad. A short consent form was attached with the provided questionnaire and students who accepted the consent statement voluntarily were included as participants of the study. The questionnaire had twenty questions and by applying Cronbach's alpha the internal consistency of the questionnaire was found to be 0.69. The questions were based on knowledge, attitudes and practices. The questions were designed using Single Answer Multiple Choice, Likert scale format, short answer text format and Multiple Answer/Multiple Choice format.

The online questionnaire was linked to an online Microsoft Excel Spreadsheet for the collection of data. The paperback questionnaires were distributed in hand to the students and collected immediately after they had

been completed. The data collection and entry process began on 20th January 2018 and ended on 20th March 2018. The data was entered in Microsoft Excel Spreadsheet.

The data obtained was analyzed on IBM's statistical package for the social sciences (SPSS) version 23 (IBM, Armonk, NY). Descriptive statistics were used to analyze and describe the data. Analysis of variance (ANOVA) was used to test the difference in the percentages of participants using medicated soaps and non-medicated soaps. A p-value of less than 0.05 was considered significant.

## Results

A total of 474 students participated in the study. The details for demographic variables are in Table 1.

**Table 1: Demographic variables.**

Variables	
<b>1. Age (years)</b>	<b>Mean <math>\pm</math>SD: 20.9 <math>\pm</math> 0.86</b>
<b>2. Gender</b>	<b>Number of respondents</b>
Male	199 (42%)
Female	275 (58%)
<b>3. Hostelites vs Day scholars</b>	<b>Number of respondents</b>
Hostelites	384 (81%)
Day Scholars	90 (19%)
<b>4. Students per academic year</b>	<b>Number of respondents</b>
1st year	110 (23.2%)
2nd year	79 (16.7%)
3rd year	110 (23.2%)
4th year	85 (17.9%)
5th year	90 (19.0%)

The participants were further asked in the questionnaire how often they washed their hands in their typical routine out of the 5 options provided and the results are in Table 2.

**Table 2: Frequency of hand-washing**

Frequency (times a day)	Number of respondents
≥ 1 to < 5	157 (33.1%)
≥ 5 to < 10	183 (38.6%)
≥ 10 to < 15	96 (20.3%)
≥ 15 to < 20	25 (5.8%)
≥ 20	13 (2.7%)

The participants of the study were also asked to report their preferences for a specific type of brand of soap for washing hands in routine. 265 (56%) participants reported preference for medicated soaps while 79 (16.7%) participants preferred non-medicated soaps and 129 (27.3%) participants did not have any preference. The difference between the two groups was compared using the Chi-Square test. A p-value of less than 0.05 was considered significant. The results are in Table 3.

**Table 3: Preferences for brand of hand soaps**

Name and Type of Brand	Number of respondents	p value
<b>Medicated Soaps</b>		< 0.01
Dettol	126 (26.6%)	
Safeguard	69 (14.6%)	
Lifebuoy	69 (14.6%)	
<b>Non-Medicated Soaps</b>		< 0.01
Lux	79 (16.7%)	

The participants were asked to report the number of times they sanitized their hands in a day as well as their preferences for any type of brand of hand-sanitizer. The results are shown in Table 4.

**Table 4: Frequency of hand-sanitizing**

Frequency	Number of respondents
1-3 times a day	189 (39.9%)
4-6 times a day	116 (24.5%)
7-9 times a day	41 (8.6%)
10-12 times a day	16 (3.0%)

The preferences regarding hand-sanitizer brands were as follows: 134 (28.3%) participants chose Dettol, 52 (11.0%) participants chose Dial, 46 (9.7%) participants chose Purell, 17 (3.6%) participants chose Bath and Body Works and 11 (2.3%) participants chose Lifebuoy. 116 (24.5%) participants did not have a specific preference for brand of hand-sanitizer.

268 (56.5%) participants were of the opinion that television commercials presenting facts and figures about medicated soaps with children as a target audience were beneficial. Similarly, 300 (63.2%) participants believed that medicated soaps should be promoted and 306 (64.6%) participants believed that medicated soaps are the only means of combating infection.

The study participants were also asked to report the sources of information that provided them with facts and figures of both soaps and hand-sanitizers. The results are shown in Table 5.

**Table 5: Sources of information**

Sources	Number of respondents
T.V. Commercials	293 (61.8%)
Social Media	68 (14.3%)
Word of Mouth	47 (9.9%)
Articles	35 (7.4%)
Billboards	15 (3.2%)
Newspapers	10 (2.1%)
Movies	4 (0.8%)
Radio	2 (0.4%)

## Discussion

Our study had both male and female participants from all academic years. According to our results, the majority of the participants were conscious about hygiene as about 92% of the participants washed their hands at least five times a day to a maximum of fifteen times a day. This behavior can be attributed to the awareness and realization about constant exposure to microbes in clinics and hand washing being a general idea of protection against such microbes [15]. Students had a clear preference (p value < 0.01) for medicated soaps for daily use over regular non-medicated soaps and this behavior could again be driven by the strong perception among

medical students that medicated soaps provide better protection against disease causing microorganisms [16]. Our results are similar to other findings which have also reported increased awareness about hygiene among medical students [17].

Our results also reported high frequency of hand-sanitizing and main reason behind this finding could be the general perception that washing hands only with regular soaps is not enough for protection against disease causing microorganisms. Another reason for this practice could be the non-availability of soap and water at all times and the fact that application of hand sanitizers is a quicker and portable method of protection against microbes [1].

Our results also report that television as a media was the most important source of information for the students regarding medicated soaps and hand sanitizers. The fact that aggressive marketing campaigns [18] employed on television highlighting medicated soaps as a better means of protections against disease causing microbes as compared to regular soaps along with the fact that students reported television as the most significant source of information about medicated soaps explains increased use of these products amongst medical students. Constant interaction with patients in clinical wards could also be a factor to make medical students vulnerable to believe such information [19]. These results are also consistent with other studies on this topic [17]. Majority of our study participants also expressed their opinion in favor of more media campaigns to promote use of medicated products while approximately two third of these students also suggested that animated movies targeted for children be used to promote use of medicated soaps and hand sanitizers. In this context, there exists a need to introduce guidelines to regulate current marketing practices [20] of medicated consumer products among children and general population similar to the recent steps which have been taken to limit the marketing of unhealthy food items, breast milk substitutes and tobacco in the best interest of public health [21].

## Conclusion

To conclude, there is a need to educate medical fraternity and especially medical students about the pros and cons of medicated products. Furthermore, large scale studies are required to further investigate the potential

beneficial effects of these products for increased protection against disease causing microbes. More scientific data is also needed to explore possible harmful effects of medicated consumer products in general population.

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# Contraceptive prevalence rate in women of reproductive age in a semi urban community of Islamabad

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## Author's Contribution

<sup>1,2</sup> Conception, design and planning of research study

<sup>3,4</sup> Data collection, analysis, interpretation and manuscript writing

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## A B S T R A C T

**Objective:** To determine the prevalence of utilization of family planning methods among married women of reproductive age in a semi urban community of Islamabad.

**Methodology:** A cross-sectional survey was done using two stage sampling, including cluster and consecutive sampling techniques. A proportionate sample from each mohallas of Nurpur Shahan was taken to achieve our sample size. All married women of the reproductive age group (15-45 years) living with their husbands, not diagnosed as a case of infertility and permanent residents of Nurpur Shahan were included.

**Results:** Total of 550 women were included in the study with mean age of 31.64 years. Majority of women 497 (94.7%) were currently married while 322 (59.9 %) were literate. Of all the women, 72 (13.2%) women were currently pregnant and only 62 (11.3%) had a planned pregnancy. Induced abortion was practiced once by 9 (1.8%) women and 21 (4.1%) had done it twice. 394 (72.8%) had knowledge of family planning methods and only 102 (19.5%) women were using family Planning methods currently.

**Conclusion:** Miscellaneous challenges are involved to increase involvement of the women and their families in the use of family planning services. Health education campaigns at community level to increase awareness regarding different family planning methods are highly needed. Government needs to improve the LHWs services to increase the use of family planning methods and combat induced abortions as a method of contraception. Controlling population through sterilization after attaining a large family size should not be the preferred method of family Planning.

**Keywords:** Family planning methods, woman literacy, knowledge.

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## Introduction

Global population stands over 6 billion. Uncontrolled population expansion is the main obstacle in national development. Pakistan is the 6th populous country in the world with a population of 210 million according 2018 censuses and expecting to reach 335 million in the year 2050. Over population in Pakistan is the main burning problem which is a major cause of poverty, illiteracy, decrease economic growth and ill health. An estimated 890,000 induced abortions occur annually according to

survey by population council, 196000 women are treated each year for complications resulting from unsafe abortions [1]. There are important negative consequences for health related to high fertility, impacting maternal and child morbidity and mortality, as well as economic development. High fertility also increases the number of times a woman is exposed to the risks of child bearing, e.g. unsafe abortions, anemia, and maternal death from complications [2, 3]. Family planning has been defined

(WHO, 2015) as “Family planning allows people to attain their desired number of children and determine the spacing of pregnancies. It is achieved through use of contraceptive methods and the treatment of infertility” [4]. While the previous definition focuses on limiting the size of the family, the 2009 Collins English Dictionary, specifies the use of contraceptives when defining family planning as “the control of the number of children in a family and the intervals between them, especially by the use of contraceptives” [5].

According to the Contraceptive Performance Report released by the government of Pakistan, Pakistan has the sixth position in the world population ranking with over 164 million people. This ranking is expected to rise by the year 2050 when Pakistan is likely to rank in 5th place. This rapid growth poses several problems like food insecurity, economic instability, increase need for health and energy resources and law and order situations. Therefore, the government of Pakistan prioritizes the need for expansion of Family Planning services throughout the country [6].

The Lady Health Workers’ Program, National Program for Family Planning and Primary Health care was launched in 1994 by the government of Pakistan. Through training of Lady Health workers (LHWs), the coverage of essential health services including family planning services extended to most parts of the country covering up to 60-70% of the population. The impact of this program has been such that there has been an increase in the Contraceptive Prevalence rate (CPR) in those communities being served by the LHWs [7]. On the other hand, there are also studies which show that rates of contraceptive discontinuation are also high due to several reasons including side-effects, health concerns, accessibility etc. [8, 9].

Nurpur Shahan is a semi-urban community located about 15 km from the city center of Islamabad with a population of around 50,000. This community is gradually expanding as it is a convenient facility for refugees and internally displaced persons. Low literacy rate and poor health status are remarkable challenges of this vulnerable population. Primary and secondary schools are very few with no colleges in the area. As this area is not catered to by any government facility like a basic health unit or rural health center most of the health care is provided by

private enterprises. Therefore, there have been no appointed LHWs working in the area. As a result, there is no systematically documented data regarding the needs and prevalence of utilization of family planning services within this area.

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## Methodology

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This community based cross sectional survey was done among 550 married women of reproductive age group in Nurpur Shahan, a semi-urban community of Islamabad. A semi-urban community is a community located between urban and rural areas and having minimum facilities as compared to urban areas. This area does not have any health care facility by the government and the nearest hospital is at a distance of about 15 KM, although some private clinics are working.

Sampling was done using two stage sampling, including cluster sampling and consecutive sampling techniques. WHO sample size calculator was used with 95% CI, 3% (0.03) absolute precision, and P (ref) of 16% (0.16). The sample size thus calculated was 574 rounded off to 550. Mapping was done and several major Mohallas were identified for collection of data. A sample of proportionate sample from each mohalla was taken to achieve our sample size. In each Mohalla, the first street was taken as the starting point. In case of refusal by a household, the next one was selected. In case there were more than one married eligible woman in the house, the first one was selected for the study after informed consent. A self-constructed questionnaire comprising of 51 questions was used as a tool after informed consent was taken. Women of reproductive age (15-45 years) living with their husbands, not diagnosed with case of infertility and permanent residents of Nurpur Shahan were included in the study.

The key variables of interest are women education status, family size, number of children, number of abortions and knowledge and use of contraceptive methods.

The data was stored and analyzed using Statistical package for social sciences (SPSS) version 21. Descriptive statistics were calculated for the quantitative variables. The chi square was applied to find the association between women education and knowledge about contraception and induced abortions.

Ethical approval of the study was taken from Institutional Review Board and Ethics committee of Shifa International Hospital before starting the study.

## Results

Age of women included in study were between 16 to 49 years with the mean age of 31.64 years. Majority of the women were currently married 497(94.7%) while 43 (7.8%) widowed, 8 (1.5 %) divorced and 2 (0.4%) were separated. Of all the women included in the study, 322 (59.9 %) were literate while 216 (40.1%) were illiterate. Literacy percentage was better in their husbands with 460 (84.6 %) literate while 84(15.4 %) illiterate.

Of the 550 women who were included in the study, 72 (13.2%) women were currently pregnant. Of the 72 women, who were currently pregnant, only 62 (11.3%) had a planned pregnancy while 34(6.2%) did not want to get pregnant and 454(82.5%) did not answer the question. Majority of women 309(56.4%) had 3 live children, 153(27.8%) had more than 3 while 86(15.7%) had no children. Preference regarding gender of the baby, 88 (31.5%) wanted a boy, 36 (12.9%) wanted a girl and 155 (55.6%) had no choice. Of all the women 9 (1.8%) had practiced (through a LHV/Dai) induced abortion once, 21 (4.1%) had done it twice while 477 (86.7%) had never practiced it.

**Table 1: Demographic Variables**

Demographic variables	Responses	Frequency (n=550)
Women education level	Primary	112 (34.8 %)
	Secondary	152 (47.2 %)
	Higher secondary	31 (9.6 %)
	Graduate	18 (5.6 %)
	Postgraduate	9 (2.8%)
Husband's education Level	Primary	118 (25.7 %)
	Secondary	218 (47.4 %)
	Higher Secondary	62 (13.5 %)
	Graduate	45 (9.8 %)
	Postgraduate	17 (3.7 %)
Women employment Status	Housewife	492 (89.5%)
	Government job	1 (0.2 %)
	Private job	12 (2.2%)

Husband's employment Status	Business	18 (3.3%)
	Other	27 (4.9%)
	Unemployed	40 (7.9%)
	Government job	109 (21.5%)
	Private job	168 (33.1%)
Women Income (Pak Rupee)	Business	74 (14.6%)
	Laborer	117 (23%)
	None	439 (80%)
	< 10,000	58 (10.6%)
Husband Income (Pak Rupee)	10,000 - 20,000	8 (1.9%)
	> 20,000	42 (7.7%)
	None	40 (8%)
	< 10,000	198 (39 %)
	10,000 - 20,000	163 (32.8%)
	> 20,000	100 (20.1%)

Maximum women 377(71.5%) had the knowledge that birth interval is good for health of the mother and child, 9 (1.7%) had the concept that's it's done to control the population, 43(8%) thought that it should be practiced due to financial reasons while 109 (20.3%) had other reasons.

The source of current family planning methods in use was government hospital 80(39.2%), family planning clinic 34(16.7%), private hospital/clinic 15(7.3%), others 31(15.2%) while 44 (21.6%) did not knew.

Strong association was found between women education and knowledge of family planning ( $P < 0.05$ ). There was no association between women literacy and induced abortions.

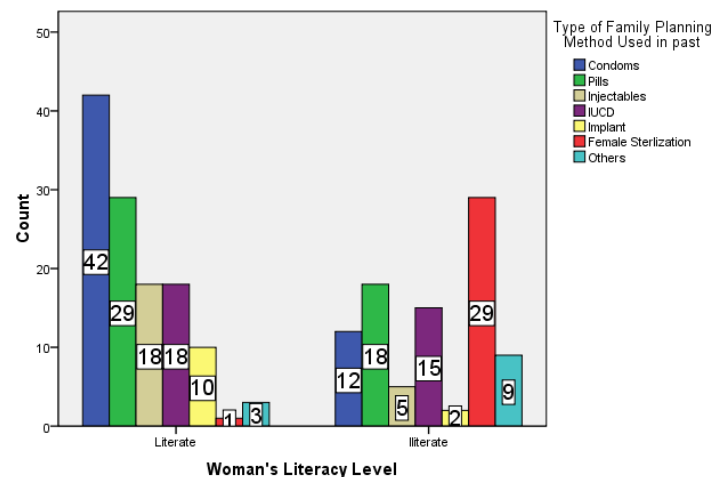
**Table 2: Family Planning Methods Knowledge**

Family Planning methods	Responses	Frequency
Knowledge of family planning methods	Yes	394 (72.8%)
	No	147 (27.2%)
Source of family planning methods	Govt. Hospital	120(22 %)
	Private clinic	99 (19.1%)
	Others	51 (9.6%)
	Don't Know	159 (30.6%)
Use of Family planning methods in past	Yes	208 (38.5%)
	No	331 (61.55%)

Decision maker for Family planning methods (first time)	Women	111 (55.8%)
	Husband	44 (22.1%)
	In-laws	9 (4.5%)
	Health worker	15 (7.5%)
	Others	20 (10.1%)
Duration of Family planning methods use in years	Less than 2	58 (55.2%)
	2- 4 years	11 (10.5%)
	More than 4	36 (34.3%)
Reason for stopping family planning	Wanted another child	29 (27.1%)
	Wanted a son	2 (1.5%)
	Afraid of side effects	5 (3.8%)
	Opposed by husband	17(6.8%)
	Relatives/in-laws opposed	7 (2.8%)
	Health reasons	26 (14.5%)
	Others	56(43.5%)

Future plans of FP use	Yes	245(47.6%)
	No	218 (42.3%)
	Not sure	52 (10.1%)

Relation of woman's literacy with Type of Family Planning Method Used



**Figure 1: Association between women literacy and the type of family planning methods used in the past**

Condoms were the most common type of family planning methods used by the literate women (42) while female sterilization (29) was the most preferred method of family planning among illiterate women.

## Discussion

Rapidly increasing population in Pakistan needs to be addressed as it's the key to control all the problems including scarcity of resources, poverty, ill health and illiteracy. The mean age of our participants was 31.64 years compared to 27.2 Years in a study from Karachi. Literacy rate in our study was low 322 (59.9%) which was better compared to the literacy rate 30% in the same study from Karachi and 60% in a study from rural area of Faisalabad. Of these women only 112 (34.8%) had primary education compared to 76 (17.7%) women and 31 (9.6%) had higher secondary education compared to 12 (2.8%) in a study from Karachi [1]. Husbands literacy rate was much better 84% compared to the women but this does not define higher education as we define that any person who can write his name is a literate or even has attended school below primary level.

**Table 3: Family Planning Methods Practices**

Family Planning Methods Practices	Responses	Frequency (n=550)
Currently using any FP method	Yes	102 (19.5%)
	No	422 (80.5%)
Type of family planning method used in past	Condoms	54 (25.6%)
	Pills	47(22.3%)
	Injectables	23(10.9%)
	IUCD	33(15.6%)
	Implant	12 (5.7%)
	Female sterilization	30 (14.2%)
	Others	12 (5.7%)
Preferred method of Family Planning	Condoms	48 (17%)
	Oral pills	59 (20.8%)
	Injectables	31 (11%)
	IUCD	14 (4.9%)
	Implants	2 (0.7%)
	Sterilization	77 (27.2%)
	Others	31 (11%)
	Don't know	21 (7.4%)



In our study, the number of women who had experienced abortions (spontaneous + induced) was 197 (36.1%) while the number of induced abortions practiced by women with help of Dai/LHV was 9 (1.8%) once and 21 (4.1%) twice. When we compare our results with another study the number of abortions is 78 (26%) one to two times and 05(1.6%) three to five times, which is almost same like our results but the frequency of induced abortions is not mentioned in that study [10].

The preferred family planning methods in our study were condoms 48 (17%), oral pills 59 (20.8%), Injectables 31 (11%), implants 2 (0.7%), IUCD 14 (4.9%), sterilization 77 (27.2%), others 31 (11%) and 21 (7.4%) did not knew. Barrier method 88 (20.46%) was the most preferred method in a study from Karachi while emergency contraception was practiced by 12 (2.8%) [1]. In a study from India, approximately 40% women were currently using one or the other method of contraception. Barrier method was the most commonly used (64%) followed by oral pills (25%). A study in China showed the condoms to be the common method adopted by women for contraception because of awareness for using condoms as the safest method of contraception [11]. A study in Malaysia showed that Depo-Provera is the most preferred method followed by Oral contraceptive pills and injectables [12]. Injection was the preferred method of choice used by majority (59%) of the women in another study from Pakistan [13].

In our study, the results of duration of use of any of the above modern contraceptive methods was less than 2 years 58 (55.2%), 2-4 years 11 (10.5%) and more than 4 years 36 (34.3%). In a study from Faisalabad the results of duration of use for less than 2 years was 215 (71.6%), 2-4 years 37 (12.3%) and more than 4 years 48 (16.2%). So, it shows that there is need of proper counseling and awareness about contraceptive methods so that the duration of use can be increased to have a good birth spacing.

Results regarding benefits of contraception in our study were that maximum women 377 (71.5%) had the knowledge that birth interval is good for health of the mother and child, 9 (1.7%) had the concept that it is done to control the population, 43 (8%) thought that it should be practiced due to financial reasons while 109 (20.3%) had other reasons. In the study from Faisalabad, the results

were for better health of mother and child 107 (35.6%), better upbringing and education of the child 39 (13%), better well-being 110 (36.6%) and 44 (14.6%) did not knew [7]. In another study from Nigeria television and radio messages were the associated with highest use of family planning methods [14]. In our study 394 (72.8%) of the participant women had knowledge of family planning methods compared to 89% (249/280), of respondents in a study from Ghana [15].

Main source of family planning services in our study was government hospitals 120 (22%), family planning clinics 91 (17.5%), private clinics 99 (19.1%), others 51 (9.6%) and 159 (30.6%) did not have any idea. In a study from India, the main source of knowledge was media followed by healthcare workers & social circle [16]. LHW/Nurse was the most common resource 90 (30%) while Neighbors/friend 89 (29.6%), Doctor 56 (18.6%) media 12 (4%), husband 21 (7%), mother/sister 11 (2.6%) and none 21 (7%) in the Faisalabad study [10].

According to our study, overall women using contraception currently was 102 (19.5%) compared to a study from India where 40% women were currently using contraception [15] and 27% in another study from Delhi [17].

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## Conclusion

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Miscellaneous challenges are involved to increase involvement of the women and their families in the use of family planning services. Health education campaigns at community level to increase awareness regarding different family planning methods are highly needed. These endeavors can best be achieved by private organizations working in the area including Shifa College of Medicine from where this study was initiated. The Government needs to improve the coverage of LHWs services within this area to increase the use of family planning methods and combat induced abortions as a method of contraception. With the new government taking over recently it is hoped that this objective may be achieved considering the area's close proximity to the Prime Minister's secretariat. Controlling population through sterilization after attaining a large family size should not be the preferred method of family planning as identified in our study.



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# Trends of undergoing formative assessment in undergraduate medical students

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## Author's Contribution

<sup>1</sup> Conception, synthesis, planning of research and manuscript writing

<sup>2</sup> Interpretation and discussion

<sup>3,4,5</sup> Data analysis, interpretation and manuscript writing

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## A B S T R A C T

**Objective:** Medical curriculum is always subject to new strategies to ensure effective delivery of learning material. Online formative assessments are gaining popularity over conventional paper based formative assessments due to recent advances in technology and increasing familiarity of students with computer-based examinations. With this background, objectives of this study were to explore trends of computer based formative assessment in undergraduate medical students and to investigate the impact of online formative assessments on summative assessment scores.

**Methodology:** A prospective cohort study was conducted on 100 medical students from 3rd year in November 2016 and July 2017. The data was collected using SPSS software and analyzed by T-tests and descriptive tables.

**Results:** The mean summative score of students who took an online formative assessment in a module was significantly higher compared to mean score of students who did not take formative assessment. Mean summative score of another group of students who took an online formative assessment in a different module was statistically different than mean score of students who did not take formative assessment (p- Value = 0.00).

**Conclusion:** Online formative assessment is an effective tool for improving student's performance in the summative assessment.

**Keywords:** Cohort study; Pakistan; Medical Education; CBA; Formative assessment

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## Introduction

Formative assessment is defined as "all those activities undertaken by teachers and/or students which provide information to be used as feedback to modify the teaching and learning activities in which they are engaged" [1]. It has been made an integral part of medical education after various studies proved it to be an effective tool for improving students' learning by making them self-directed, self-regulated life-long learners [2, 3]. This assessment is incomplete without effective feedback that focuses on addressing the topic, response, discussing errors, providing examples, guidance and opportunity to review [4]. When combined, the student is able to make a personalized portfolio. A portfolio is defined as "a

collection of evidence that is gathered together to show a person's learning journey over time and to demonstrate their abilities" [5] and is essential for self-reflection. As shown by a study, self-reflection from a portfolio enhances the entire learning process [6].

Medical curriculum is known to be subject to various strategies to rejuvenate the teaching and learning delivery methods, formative assessments are one such means to ensure deeper learning and understanding [7]. One study proposed that repetitive exposure to such testing techniques will promote self-reflection and self-efficacy for subsequent tests [8]. However, this strategy is believed to

be only useful when there is no presumed evaluation stress present in the minds of the students [9].

Paper-based formative assessments have many limitations [10]: students have to be gathered and supervised; individualized feedback is time-consuming, and not be feasible with large class sizes [11]; and analysis of question reliability and validity can be tedious [12]. The most important limitation is the fact that majority of post-graduate and specialization examinations have opted for a web-based approach. This web-based approach requires a different mindset that makes practice by paper-based formative assessments outdated. These are persuasive arguments for moving from paper-based to online formative assessments.

In recent times the use of technology is gaining popularity in every field and medical education is no exception. New recommendations in medical education support the use of technology as a teaching modality as well as an assessment tool [13]. These include multimedia, e-portals, simulations, and Computer Based Assessment (CBA); which is both delivered and marked by computer [14]. Online formative assessments are very effective for students: immediate feedback; flexible time and place of undertaking the assessment; feedback can be linked to learning resources, thus motivating proper study habits; opportunity for spaced repetition; and interactivity [10]. Furthermore, a comparative study has reported that online formative assessments might be of greater benefit for learning than paper-based equivalents [12].

CBA, as a tool for formative assessment, is being tested for its efficacy in relation to the students' performance in the summative assessment. In a review study of 85 articles, it was found that CBA is being employed widely in undergraduate medical education. Most of these assessments are conducted in the Multiple Choice Question (MCQ) format in both formative and summative assessments. Formative CBAs are being used as a prelude to summative assessment as a tool for providing effective feedback, identifying learning gaps, and guiding students' to improve their academic performance [15]. As demonstrated by Henly and Reid, the students who voluntarily choose to take online formative assessments are shown to be more thorough in

completing their tasks and are thus high achieving [16, 17].

With this background, objective of this study was to explore reasons for taking formative assessments by medical students. Furthermore, this study aimed to investigate preference of students among different tools of formative assessments and to evaluate the impact of online formative assessment on summative scores.

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## Methodology

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A prospective cohort study was conducted in November 2016 and July 2017 to explore the impact of CBA on summative assessment in undergraduate medical students. The study was based on a population of 100 medical students from 3rd year, Shifa College of Medicine respectively, for the two modules that were assessed for the study

Shifa College of Medicine (SCM) follows an integrated curriculum with longitudinally and vertically integrated themes. Each academic year is divided into several modules and taught through a combination of Large Group Interactive Sessions and Small Group Discussions. The assessment comprises of formative assessments during the module followed by an end of module summative assessment. After approval for the study was granted by the Institutional Review Board, two online formative assessments were conducted in a class of 3rd year students.

One of these formative assessments (test I) was conducted in November 2016 in the Essentials of Medicine II (EOM II) module which was 3 weeks long. The other formative assessment (test II) was carried in July 2017 in the neurosciences module which included psychiatry (NEU). NEU consisted of 8 weeks of teaching after which the students appeared in an end of module summative assessment. The tests were designed by the module coordinators and presented using the online website classmarker.com. The questions were of the multiple choice format and items were developed by the content experts. Both formative assessments were optional. Voluntary participation in the assessment was considered as consent for this study. The students were informed about the formative assessment at the end of small group discussions and were later reminded through e-mail. The tests were accessible for 36 hours over the

weekend and the students were allowed to access it at their convenience. They were not allowed multiple attempts at the same test. For both tests all questions were mandatory and carried equal marks. There was no negative marking.

Test I consisted of 22 multiple choice questions. A total of 26 minutes were given for taking the test and a 'resume later' option was available. After submitting answer of any question, students were not allowed to go back to attempt the question again these are specific type of questions. After attempting any question, the students were given messages in case of correct or incorrect answers but the key was not displayed in case the answer was incorrect. Test II consisted of 20 MCQs and the students were allowed only one attempt for each question. The students were allowed to pause the test and resume later. On the completion of each test, a result was displayed for the students which showed the number of correct and incorrect answers and a customized feedback.

Following each test, an interactive large group discussion was conducted by the faculty to discuss the correct answers for the given questions. This was also an opportunity for the students to clarify any queries regarding these topics. In these sessions, the students were distributed sheets to record their reasons for either taking the formative assessment or not. The students were also requested to comment on the formative assessments. At the end of both of these modules a summative exam was carried out.

The scores of all students were recorded on an excel sheet which also included the summative exam score for each student. The students were divided into two groups for each module concerned, A1: students who took the formative assessment and B1: students who did not take the formative assessment. SPSS software-based t-tests were used to produce summaries comparing the summative assessment and formative assessment results in form of tables

## Results

The features of both the online formative assessments were recorded in Table 1. The mean scores were used in further statistical analysis.

**Table 1: Features of EOM and NEU formative assessments.**

Features	EOM Formative Assessment	NEU Formative Assessment
Min. time taken (in seconds)	424	159
Max. time taken (in seconds)	1560	1320
Average time (in seconds)	1047	710
Min. score (%)	0	0
Max. score (%)	95.5	100

In the EOM module, out of 101 students, 49% took the formative assessment while 51% did not. The mean summative score for the group of students who took the online formative assessment was 11 marks more than the score of the students who did not. The male to female ratio was about 1:1. In the NEU module, out of 100 students, 48% took the formative assessment while 52% did not. The mean summative score for the group of students who took the online formative assessment was 9 marks more than the score of the students who did not. The male to female ratio was about 1:1.

To assess the overall impact of formative assessment assessments on the mean score for summative assessments, the scores were compared using a t-test and the results were recorded in Table 2.

**Table 2: Impact of computer-based formative assessments on summative assessments.**

Exam Type	Mean Score	p value
EOM formative assessment	31.4	< 0.05
EOM summative assessment	70.1	
NEU formative assessment	36.1	< 0.05
NEU summative assessment	72.9	

Furthermore, to assess whether the summative scores of students who took the formative assessment in each module (A1) were better than those who did not take the

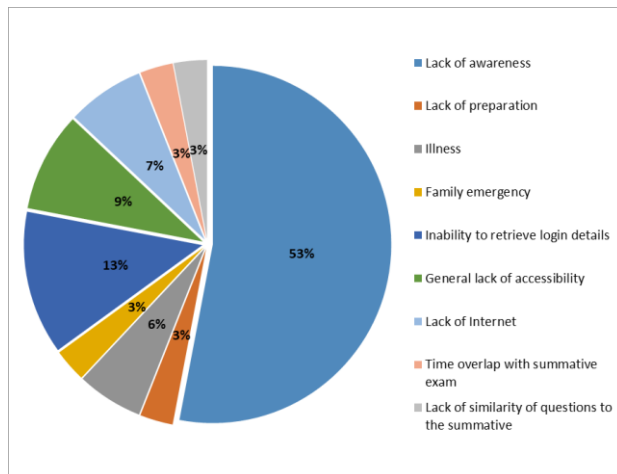
formative assessment (B1), another t-test was conducted and the results are in Table 3.

**Table 3: Comparison of summative scores for the two types of student groups.**

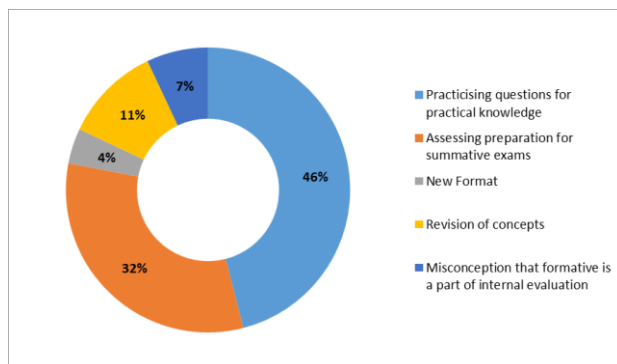
Summative Exam	A1*	B1*	p value
EOM	75.5	64.8	0.00
NEU	77.4	68.2	

\*A1=students who took the formative assessment, B1=students who did not take the formative assessment.

The Large Group Interactive Session that followed each formative assessment highlighted the students' reasons whether to take the formative assessment or not. Figure 1 and 2 display the results for the reasons provided by many students.



**Figure 1: Students' reasons for not taking the formative assessment.**



**Figure 2: Students' reasons for taking the formative assessment.**

General themes from the comments of the students were identified, with regard to specific unique details that some students had mentioned. Many participants commented that the formative assessments should be taken in every module (36%) with some mentioning that there should be a minimum of 3 online formative assessments (3%). Some participants even continued to explain that there is a lesser chance of bias (3%) and that this form of learning was both time-saving (8%) and mentally stimulating (3%). Some participants commented on one particular limitation about this form of assessment that the two exams, formative assessment and summative assessment be at least a week apart for less time overlap (5%).

## Discussion

The mean time in our study for both the online formative assessments was far lesser than the mean time of a 2008 study in which the average time was  $32 \pm 5$  minutes ( $1920 \pm 300$  seconds) [18]. This concludes that the number of questions in a formative assessment can definitely change the thinking time span because our study had 20 questions each for both online formative assessments whereas the study in 2008 had 25 questions [18]. Furthermore, our study included questions of a multiple-choice format while the study in 2008 had extended matching questions which concludes that the thinking time is also influenced by the style of these formative assessments. The percentage of students taking the formative assessment had slightly dropped (1%) in the NEU module which can be attributed to the fact that the summative assessment for NEU module was scheduled quite close to when the online formative assessment was conducted.

The formative assessment did generally improve the overall mean score of the summative exams for both the modules which was statistically significant ( $p$  value  $< 0.05$ ). Our results show that students who had taken the online formative assessment had a score of 75.5% in EOM and 77.4% in NEU summative assessment while the students who did not take the formative assessment had 64.8% and 68.2% in summative assessments respectively. This reinforces the idea produced by a 2015 study that formative assessments can improve learning



and students who might not be able to do well on the summative exam can be identified, beforehand [19, 20].

A study conducted in Malaysia showed that CBA with automated feedback improved the performance of high achieving students in subsequent summative assessment [21]. Although this needs further research, a positive impact of Computer Based formative assessment on summative performance, at least in the high achieving students, can be expected [22]. This is supported by our study. However, when compared with this study, the mean score of formative assessments of our students was lower, 31.4 and 36.1 versus  $61.7 \pm 17.6$  [23]. But, the scores of our students in summative exams were much higher than the students in the Malaysian study, 70.1 and 72.9 versus  $56.4 \pm 12.2$  [23]. The difference can be attributed to the reason that students focus more on exams that count towards their internal assessments.

In terms of students' perception towards CBA, a study in Singapore showed that 79.8% final-year students preferred computer based MCQ exam over paper-based assessment (PBA) [24]. Furthermore, in a similar study in post-graduate trainees in Pakistan, 61.8% rated CBA better than PBA [24]. Although our study did not aim at comparing the two modes of formative assessment our qualitative data reflected that the students will like to see more of this assessment tool in the course of their education which highlights the fact that computer-based assessments are much less threatening as shown by many studies [25].

The general themes that were concluded from the free-text comments provided by many participants strengthened the notion that CBA is a very flexible method of assessment [26]. Although online formative assessments are being introduced widely into undergraduate medical colleges, their benefits need validation by further studies. The results of our study can be taken as a cue for further exploration in the field of 'online formative assessments' as a replacement for 'paper based formative assessments' [27].

The noteworthy concerns regarding online formative assessments were mainly related to technical issues as stated by some students that they had difficulty in accessing the test due to poor internet connection and problems with the server which interferes with the validity

of CBA [28]. These factors will need further deliberation in our settings before online formative assessments can be made a more permanent feature of our assessment.

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## Conclusion

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To conclude, formative assessment is a very important tool to assess and improve learning. There should be more large-scale studies to evaluate multiple technological interventions to conduct formative assessment.

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# Medical students assisted health checkup and focused health education – An integration of community and family medicine

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## Author's Contribution

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<sup>3, 4</sup> Data analysis, interpretation and manuscript writing

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## A B S T R A C T

**Objective:** The objective of the study was to integrate family medicine practice with the theme of school health service, nutrition and communication skills in the year 4 MBBS curriculum at Shifa College of Medicine, Islamabad.

**Methodology:** Health checkup of students aged 5-15 years, in a private school Mashal Model School, Nurpur Shahan, Islamabad was carried out by a family physician assisted by 100 medical students of Year 4, undergoing Community and Family Medicine clerkship at Shifa College of Medicine, Islamabad. School children were given health education in their identified health problem. Medical students' views regarding the activity were recorded through focused group discussion.

**Results:** Each medical student got the opportunity to assist health checkup along with educating them on their health issue in an interactive group discussion for five minutes. Mean score of the impact of this activity on their career was found to be  $7.55 \pm 1.04$  while the impact of this activity in their role as a health provider was found to be  $7.64 \pm 1.12$ . Different themes were generated from the focused group discussion.

**Conclusion:** Themes of school health service, nutrition and communication skills can be successfully integrated in the undergraduate teaching of community and family medicine. Medical students by assisting the generalist practice in the school environment can learn communication skills, thus moving towards social responsibility.

**Keywords:** Community-Based Education, School health service, Health check –up, CANMED's, Integrated curriculum

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## Introduction

Health Advocacy as part of Community Based Education (CBE) is one of the seven important competencies for physicians as stated in CanMED's framework. CanMed's framework identifies the abilities a physician should have to effectively serve the health needs of the community they are to serve [1]. The definition of health advocate according to this framework is "As Health Advocates, physicians contribute their expertise and influence as they work with communities or patient populations to improve health. They work with those they serve to determine and understand needs, speak on behalf of others when required, and support the

mobilization of resources to effect change" [1]. Disease Prevention, Health promotion, and health protection play a vital role in improving the overall health of the community. A physician should be able to identify the needs of the community and devise an appropriate and effective mechanism to address these needs. Advocacy also involves engaging other health care professionals, local community agencies and health policy-makers in order to devise an effective long-lasting solution for the need of the community. CanMED's framework has now been applied to several undergraduate programs all over the world [2-6]. Different studies have advised

incorporation of health policy and advocacy in medical curriculum in order to make competent future physician [7].

Our study has been based on the health advocacy component of the CanMEDS's framework. Medical students need to develop health advocacy skills in order to address health issues meaningfully especially at the community level where there is a dearth of such services. The objective of the study was to identify areas for imparting health education to school children by doing their first health check up through the assistance of medical students, focusing primarily on nutritional assessment. Secondary Objective of the study was to integrate family medicine practice with the theme of school health service, nutrition, communication skills in the year 4 MBBS curriculum at Shifa College of Medicine, Islamabad, Pakistan.

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## Methodology

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We carried out a mixed method study; qualitative and cross-sectional study from June 2016 to June 2017 in Mashal Model School located in a peri-urban slum, Nurbur Shahan, Islamabad. The school consists mostly of local street children.

Health assessment of the students was carried out by faculty member with dual specialization in family medicine and public health. This was assisted by year 4 medical students attending the community and family medicine clerkship. There are five clerkship batches in Year 4 comprising of 20 students per batch, thus making a total of 100 students. It was mandatory for all the students to participate in the school based activity as part of community family medicine clerkship schedule. All the students consented to participate in the study, resultantly they all participated in the study. Each medical student assisted the family physician in checkup of 3 school children in a clerkship batch of 20 students, resulting in a checkup of 300 children in one session. The total student strength of the school is 750.

Data was collected from the school students over a period of one year through 5 clerkship batches. The school students were selected from consecutive sampling. Students who had been assessed by the previous batches were not checked again. To ensure this the researcher first prepared the sampling frame. Their

names were taken out once their data were collected. This list was brought by the researchers on every visit. The Identity of respondents was kept anonymous. Informed consent was obtained from the principal of the school. Following health assessment, medical students organized children into groups based on the common health problem. They were then given health education in the urdu language through an interactive talk. Medical students were evaluated during the entire process and were given feedback by accompanying faculty towards the end. A questionnaire containing different components of the activity was given to the medical students. The students were asked to score all the components of the activity on a scale of 1 to 10; with 10 being the maximum and 1 being the minimum score. The components assessed were; the impact of this activity on their career, their role as a health provider, relevance of this activity to the curriculum of community and family medicine, benefit of this activity to the school and the community as a whole and recommending this activity for future groups. Each medical student was given 10 minutes to fill these 4 questions. Following this, they were interviewed regarding the activity. A focused group discussion with 10 volunteers from each clerkship batch was carried out through a focused group guide. A questionnaire containing different components of the activity was given to the medical students. The students were asked to score all the components of the activity on a scale of 1 to 10; with 10 being the maximum and 1 being the minimum score. The components assessed were the impact of this activity on their career, their role as a health provider, relevance of this activity to the curriculum of community and family medicine, benefit of this activity to the school and the community as a whole and recommending this activity for future groups. Following this, they were interviewed regarding the activity.

Data was collected and entered into SPSS version 21. Descriptive statistics were calculated for all variables. Thematic analysis was done for qualitative variables.

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## Results

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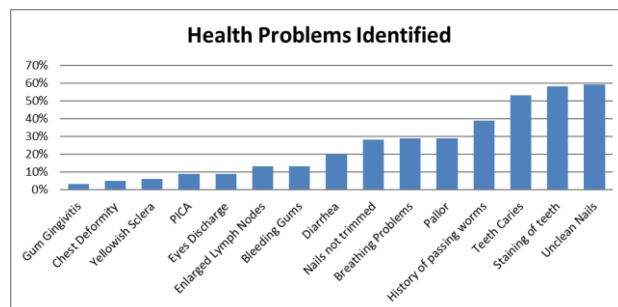
Out of 100 Year 4 medical students, 45% were males while 55 % were females. Mean age of the medical students was  $22 \pm 1.7$  years. All the participants recommended this activity to their peers. Scoring of

different components of this activity is presented in Table 1.

**Table 1: Mean score rated by year 4 MBBS students regarding different components of the school activity (n=100).**

Different components of the school activity	Mean $\pm$ SD
Benefit to School and the community as a whole	8.18 $\pm$ 1.32
Impact in terms of role as a health care provider	7.64 $\pm$ 1.12
Relevance to the curriculum of family medicine	7.97 $\pm$ 1.28
Impact on your career	7.55 $\pm$ 1.04

Out of 300 school children, 145(48.3%) were boys while 155(51.7%) were girls. Mean age of the school students was 9.3 $\pm$ 2.5 years while median number of siblings was 6. Mean mid arm circumference was 17.9 $\pm$ 2.5 cm while the mean BMI was found to be 14.7 $\pm$ 1.9 kg/mm<sup>2</sup>. Common health problems identified among school students are presented in Figure 1.



**Figure 1: Common health problems identified among school children.**

### Themes Identified based on focused group discussion:

#### Impact of this activity on the medical student:

“Useful and Constructive”. According to them, it was a good opportunity for them to interact with the community and it helped them improve their confidence in terms of interacting with patients and the community as a whole. Identifying the different health problem and addressing them via public health talk gave students a sense of achievement by enhancing their communication and counseling skills.

“Sense of Achievement and Responsibility”. They also reported that this experience helped them develop a sense of responsibility, empathy, and sympathy. This activity also gave them insight into different health problems faced by the less privileged communities.

#### Importance of Preventive Medicine:

“Early identification of disease”: They also appreciated the importance of identifying disease earlier in the course and that earlier detection and treatment can significantly decrease the prevalence of the disease. They were of the opinion that basic problems in term of health can easily be tackled with minimum resources. Medical students felt that there was a need to spread awareness not only about the disease but also about ways to prevent the development of a disease in the community.

“Hygiene and Quality of Life” Along with this, they also learned the importance of hygiene and its impact on quality of life. It encouraged the medical student to participate in keeping their surrounding and environment clean. Medical students also deduced that the school children can enhance the success of different community health awareness programs by imparting knowledge to their parents as well and their future generation.

#### Role and Importance of Primary Healthcare:

This activity helped them appreciate the importance of primary health care and motivated them to pursue a career in community health care. This activity also broadened their knowledge base. They felt that programs like these can help them get a better grasp on the medical knowledge they have acquired during their course of study. According to some students, this activity helped them in becoming a better person and they gained spiritual health from this activity.

## Discussion

Most of the medical knowledge is imparted to the students within the medical school premises with little focus on the community. While in reality most of the diseases occur in the community and only a small portion presents to the clinics. Hence, there is a need to focus on the community particularly in regards to disease prevention, cure and to attain better perception about disease pathology.



The University of Toronto in 2012/13 integrated compulsory clinical experience in homeless health as part of their family medicine clerkship [6]. The study concluded that integration of such programs in the medical curriculum can significantly contribute to the comprehensive advocacy curriculum. Another study concluded that incorporation of healthcare policy and advocacy training programs can significantly increase students' self-reported knowledge and confidence in their abilities [6]. In our study mean score of this activity in term of its impact on the career of medical student was found to be  $7.55 \pm 1.04$ .

After interacting with the school children the medical students deduced that the local family physician was not giving adequate time to the health of the children during the monthly check up and hence they were suffering poor health. The medical students concluded that a good physician should not only treat the disease but also impart knowledge about disease prevention to the patient so that the incidence of the disease can decrease. A study done in Iran had a similar conclusion [8].

Empathy is the capacity to understand or feel what other person is experiencing from within the other's being frame of reference. Patients want their doctor to be academically competent and have personal qualities that contribute to their professionalism. Patients whose doctors listen to them have been shown to demonstrate enhanced understanding of their disease and are found to be more satisfied with their treatment and have a better quality of life as compared to patients of a doctor with less empathy [9]. Clinical empathy can have a significantly enhance the quality of medical care [10]. Empathy helps the physicians by appreciating what the patient's actually mean, helps identify what the patient is anxious about, it facilitated patient trust and disclosure, increased to adherence to treatment, lesser malpractice complaint, related to more favorable health outcome and it makes practicing medicine more meaningful and satisfying [11, 12]. Different studies have concluded that lack of apathy in doctors is one of the most common sources of distress to the patients [13 - 15]. A study concluded that there was a need to teach empathy to the doctors to prevent burnout among doctors [16]. This activity helped the students to understand the concept of empathy and enhanced their empathy abilities. Most of the students

were of the opinion that having empathy is one of the qualities of a good doctor. Incorporation of activities of this kind in the medical curriculum can significantly enhance the empathy skills of medical students.

Such programs helped the medical students to identify the difficulties faced by the society and helped them identify the major impediments to various health programs going in that area. Thus, in future, they can modify their practices according to the needs of the community and can come up with better health awareness policies and campaign which is tailor made for the particular community. In our study medical students found out that although school children were aware of the proper practices regarding dental hygiene but unfortunately they did not practice them which resulted in poor dental health.

This activity also helped the student to appreciate the importance of proper personalized dietary device to the health of the patients. Some of the medicine students reported that this activity helped them appreciate different causes of nutritional deficiency and their prevalence in the society.

Implementation of community-based education will not only give a confidence boost to the medical student but will also benefit the community. Repeated visits by the students to the locality will keep the people aware of different health issues and would ensure that they are taking the proper preventive measures. A study concluded that developing interceptive awareness in people improved the degree of people practicing prevention in that area [17]. Our study had a similar result.

According to a study community program such as these can encourage the student to consider a career in general practice [18]. These programs were also found to influence medical student's intention to work in rural areas in future [20]. Such programs can solve the shortage of primary care physicians in rural areas. These programs have been shown to help students to apply their knowledge and skills to a particular community in future [20].

Since this activity of community and family medicine integration among the year 4 students was carried out through single interaction, this is the limitation of the study. It is suggested that more activities of this type

should be carried among different themes to determine the extent of integration among these two curriculum.

## **Conclusion**

Themes of school health service and nutrition among school children can be successfully integrated with health education and communication in the undergraduate teaching. Medical students while assisting the generalist practice in the school environment rehearse communication skills in the context of imparting health education, thus moving towards social responsibility.

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# Prevalence of sensorineural hearing loss among patients of diabetes mellitus in Southern Punjab, Pakistan

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## Author's Contribution

<sup>1</sup> Data collection, analysis, interpretation and manuscript writing

<sup>2</sup> Conception, synthesis, planning of research, literature review and manuscript writing

<sup>2</sup> Interpretation and discussion, manuscript writing and critical revision of article

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## A B S T R A C T

**Background:** Diabetes Mellitus (DM) is a common metabolic disorder with a prevalence of 11.77%. Studies report that DM can result in Sensorineural hearing loss (SNHL). A high prevalence of Hearing loss (HL) (43.6%) in diabetics was noted in an Indian study. In absence of local studies and a high expected prevalence, with no screening recommendations, this study was carried out to determine the prevalence of Sensorineural Hearing Loss (SNHL) in Diabetes Mellitus DM in Southern Punjab.

**Methodology:** In this cross-sectional study, a sample of 310 diabetics, hailing from southern Punjab and fulfilling selection criteria were recruited. Samples were collected using probability sampling technique from September 2016 to December 2016. Following detailed history and examination, cases were subjected to pure tone audiometry (PTA) at 0.5 to 6 KHz to obtain hearing thresholds to determine the prevalence. Data was analyzed by SPSS 20.

**Results:** Sample included N=310 diabetics with Mean age of  $35.00 \pm 6.93$  years with 58.39% males and 41.61% females. The prevalence of HL was 46.1%. Gender wise of the male population with HL, 27.97% and 28.67% had mild and moderate HL respectively with severe HL in 8.39% cases, while moderate HL was prevalent in females 20.98%, followed by mild HL in 9.97% and severe HL in 4.20%. There was significant correlation between Diabetes and SNHL with p-value < 0.05.

**Conclusion:** There is a high prevalence of sensorineural hearing loss in Diabetes mellitus.

**Keywords:** Diabetes Mellitus, Hearing Impairment, Prevalence, Sensorineural Hearing Loss

## Introduction

Diabetes Mellitus (DM) is a metabolic disorder characterized by chronic hyperglycemia, resulting from impaired secretion of insulin from the pancreas or faulty utilization/ action, to regulate blood sugar [1]. It is a common problem with prevalence of as 11.77% and a gender prevalence of 11.20% in males followed by 9.19 % in females, in a local study [2]. DM is classified as Type 1 DM predominantly characterized by destruction of beta cells of pancreas, Type 2 DM showing resistance to insulin and gestational variety with glucose intolerance [3]. Hyperglycemia may cause micro vascular changes resulting in ophthalmic, renal and neuronal complications

as its consequence [4]. Sensorineural hearing loss (SNHL), is one of the critical complications [5], and Bainbridge & Hoffman found DM to be an independent risk factor for development of hearing impairment (HI) with around 35% to 60 % diabetics facing hearing deficiency [6], however this is unrelated to peripheral neuropathy [5].

Although precautionary measures for prevention of DM associated HL, have not been fully determined, however, numerous studies have reported that DM can be among others a reason of SNHL. According to Bener et al. high blood sugar level in diabetics can result in damage to the capillaries and nerves in the inner ear

resulting in HL, and concluded that high blood sugar and blood pressure, nephropathy, retinopathy, and neuropathy are the risk factors involved [7]. Rathmann and Giani noted great diversity in prevalence and risk factors of DM in Europe [8]. A high prevalence of DM (11.77%) has been noted in a local study by Meo et al. [2] and a prevalence of HL (43.6%) in diabetics was noted in an Indian study [5].

With a high expected prevalence of HL in diabetics and with no screening recommendations for HL in DM, this study was carried out to determine the prevalence of SNHL in Diabetes Mellitus DM in Southern Punjab, Pakistan. This research work provides base line knowledge hence significant since there is scarcity of local literature on prevalence of HL in diabetes from Pakistan and because knowing the prevalence could be helpful in planning screening recommendations for preventive and mitigation measures.

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## Methodology

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In this Cross-sectional study, a sample of  $n=310$  patients, calculated using statistical formula Sample size  $(n) = Z^2P(1-P) / d^2$ . Cases suffering from diabetes mellitus (DM) were recruited, using non-probability sampling. These were cases who presented in Medical and Otolaryngology outpatients of Bahawal Victoria and Bahawalpur General Hospital, Bahawalpur over a period of 4 months from September 2016 to December 2016. Sample included cases diagnosed with Diabetes Mellitus (DM), of both genders, aged 18-40 years, hailing from southern Punjab who consented for inclusion in the study. Cases with external or middle ear diseases, ototoxicity, noise induced hearing loss, tuberculosis, hypertension, other metabolic disorders, and gestational diabetes were excluded from the study.

Detailed history was obtained using patient history sheet especially related to DM like complications, duration, treatment, family history; and history of HL, smoking, use of ototoxic drugs, noise exposure, and other associated diseases. This was followed by otoscopy done in all cases, which helped excluded cases with outer and middle ear pathologies. Following this, the recruited cases which fulfilled selection criteria were subjected to pure tone audiometry PTA using pure tone audiometer (Interacoustic Model AD226 Denmark). Both ears were

tested at 0.5, 1, 2, 4 and 6 kHz frequencies. The hearing measurements were performed in a sound proof room by one audiologist using ascending method followed by descending to 1 and 0.5 kHz, as per the S 3.1-1991 specifications of American National Standards Institute (ANSI). Cases were classified according to degree of hearing loss using WHO classification. All cases were examined by a medical specialist and blood glucose estimation was done by glucose oxidase method. Cases were diagnosed as DM, depending on recommendation of National diabetes data group of National Institute of Health (Foster 1983), with a postprandial blood glucose (RBS) of 110–140 mg% and fasting blood glucose (FBS) of 70–110 mg% were considered as cases with controlled DM, while cases with FBS above 120 mg% were considered to have uncontrolled DM. Pathologies like neuropathy, nephropathy, retinopathy and vascular diseases were also noted and where required other relevant specialties were consulted.

Initially all the observations were recorded in the patient's history sheet, following which data was organized in MS Excel Worksheet and SPSS 20.0 was used for data analysis and statistical evaluation. For the variables like age and duration, the mean and standard deviation was calculated while frequency was used for the rest of the variables. The main variable in the study was hearing loss, and primary exposure variable was DM. Chi-Square Test was used to determine relationship between DM and SNHL and  $p$  value of  $< 0.05$  was considered significant. Multiple regression analysis was also performed. Results obtained were compared with literature and deductions made were discussed.

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## Results

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Our study population comprised of  $n=310$  of diabetics (Both Type I and type II DM), with mean age of  $35 \pm 6.93$  years with 58.39% ( $n=181$ ) males and 41.61 % ( $n=129$ ) females (Table 1).

Of the  $N = 310$  enrolled diabetics fulfilling selection criteria the prevalence of HL was 46.1% ( $n=143$ ) (Table 2). As regards age distribution of respondents 25.81% ( $n=80$ ) were 16-25 years old, 31.61% ( $n=98$ ) were 26-34 years old, with maximum prevalence of DM being 42.58% ( $n=132$ ) at age of 35-40 years.



**Table 1: Clinical profile and demographics of the population (N=310).**

Variables	Mean $\pm$ SD or n (%)
Age (mean in years $\pm$ SD)	35 $\pm$ 6.93
Gender- Male, Female	181 (58.39%), 129 (41.61%)
Duration of Diabetes (years)	5.83 $\pm$ 1.92
Associated Diseases (yes)	86 (28%)
Complication of Diabetes (U, C)	97 (31.3%), 213 (68.7%)
Family History of Diabetes (no)	221 (71.4%)
Control of Diabetes (C, U)	226 (72.6%), 84 (27.4%)
Medication Dose (28 units x BD)	80 (25.8%)
Medicine-taking duration (years)	5.79 $\pm$ 1.18
Hearing loss duration (years)	2.95 $\pm$ 1.73
Associated Symptoms (no)	170 (54.8%)
Kind of Hearing Loss (unilateral)	131 (42.3%)
Ear Pain History (no)	234 (75.5%)
Ear Discharge (no)	223 (71.9%)
Nasal Allergies (no)	224 (72.3%)
Head Trauma (no)	235 (75.8%)
Smoking History (no)	227 (73.2%)
Chronic Illness (no)	234 (75.5%)
Family History of Hearing Loss (no)	231 (74.5%)
Exposure with Loud Noises (no)	230 (74.2%)

(Key: C: Controlled, U: Uncontrolled, No: Negative history)

**Table 2: Prevalence of severity of HL\* Gender. Cross tabulation (n=143).**

Hearing Level	Gender				Total		
	Male		Female				
	No	%	No	%	No	%	
Mild HL	40	27.9	14	9.7	54	37.7	37.7
Moderate HL	41	28.6	30	20.9	71	49.6	87.4
Severe HL	12	8.3	6	4.2	18	12.5	100
Profound HL	0	0	0	0	0	0	
<b>Total</b>	93	65.0	50	34.9	143	100	

As regards the severity of HL, it varies gender wise (Table 2). In the male population, 27.97 % (n=40) and 28.67 % (n=41) were having mild and moderate HL respectively with only 8.39% (n=12) having severe HL, while in the females, moderate HL was prevalent with 20.98% (n=30), followed by mild HL 9.79% (n=14) and severe HL 4.2% (n=6) cases.

Overall n=93 (65.03%) males and n=50 (34.97%) females presented with HL with a male to female ratio of 1.86:1. Correlation analysis with patients divided into two groups i.e. Diabetics with SNHL and Diabetics without SNHL (Table 3), shows that HL had significant relation to variables including age, complication of diabetes, medication dosage, duration of medication and family history of HL, with p-value is less than 0.05.

**Table 3: Relationship between demographics and clinical traits of the selected patients (N=310).**

Variables	Diabetes		p value
	With SNHL (n=143)	Without SNHL (n=168)	
Age (mean in years $\pm$ SD)	37 $\pm$ 5.83	33 $\pm$ 7.92	0.043
Gender- Male	83 (58%)	98 (58.3%)	0.632
Duration of Diabetes (years)	5.75 $\pm$ 1.98	5.03 $\pm$ 1.53	0.578
Associated Diseases (yes)	35.2 (41%)	79 (47%)	0.796
Complication of Diabetes (Uncontrolled)	45 (31.5%)	97 (57.7%)	0.049
Control of Diabetes (Uncontrolled)	39 (27.3%)	45 (26.8%)	0.037
Medication Dose (28 units x BD)	37 (25.8%)	43 (25.6%)	0.048
Medication duration (years)	6.77 $\pm$ 1.99	5.19 $\pm$ 1.85	0.041
Smoking History (no)	105 (73.4%)	122 (72.6%)	0.67
Family History of HL (no)	107 (74.8%)	124 (73.8%)	0.03

Multiple regression analysis performed, assuming that linear variable (DM) has a relationship with predictor variable (HL), and the results proved that only age, DM duration and retinopathy varied in both groups with p-



value of 0.039, 0.013 and 0.049 respectively, which indicates that HL are associated with these factors in which DM duration and retinopathy points towards the relationship between hearing loss and diabetes.

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## Discussion

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Of the n=310 diabetics enrolled in this study to determine the prevalence of SNHL in DM, a high prevalence of 46.1% (n=143) was noted. Similarly, a comparable prevalence of 43.6% has been reported by Pemmaiah & Srinivas [5], 45% by Mozaffari M et al. in an Iranian study [9], and 45.31% by Gutierrez J et al. [10]. A much higher prevalence of 67.5% has been reported by Ren H et al. [11] and 51.3% by Rajamani S et al. [12]. Horikawa et al. [13], and Meena R et al. [14] also reported a higher prevalence of HL in DM. A very low prevalence of 14.3% was reported by Treviño-González et al. [15]. Kim et al. reported in a cohort study that the incidence rate of HL in sample population with normal glucose levels and those with DM were 1.8 and 9.2 per 1000 person-years, respectively [16].

In current study prevalence of HL in males was 65.03% while in females it was 34.97% with a male to female ratio of 1.86:1, while Gutierrez J et al. found no significant in SNHL gender wise with 48.94% males and 43.21% females [10]. The higher prevalence in males in this study could be due to the fact that only a small minority of female go out for work, compared to males resulting in lesser stress and HTN in females.

In the present study gender wise, in the male population, 27.97 % (n=40) and 28.67 % (n=41) were having mild and moderate HL respectively with only 8.39% (n=12) having severe HL, while in the females, moderate HL was prevalent with 20.98% (n=30), followed by mild HL 9.79% (n=14) and severe HL 4.2% (n=6) cases. With slight variation, Pemmaiah and Srinivas, found severe HL in 7 (6.36%) patients, moderately severe HL in 16 (14.54%) patients and moderate HL in 25 (22.7%) patients [5], while Rajamani S et al. found mild to moderate HL in majority of cases [12]. Morrison CL et al. reported mild HL in 14.3%, Moderate in 62.3% and severe HL in 19.5% with profound HL in 3.9% [17], while Treviño-González reported mild HL in 83.3%, moderate HL in 16.4% cases [15].

In the current study results revealed that HL had significant relation to variables including age, complication of diabetes, medication dosage, duration of medication and family history of hearing loss, with p-value is less than 0.05. Similarly, a number of studies reported that age of onset [9,10,18], duration of DM [5,9,15], female gender [12], higher HbA1C level [12], diabetes control by insulin [18], DM with complications [18,19,20], disease severity [21], diabetic neuropathy [11], were associated with SNHL. Pemmaiah and Srinivas, found that in cases who had diabetes for more than 10 years, 61.7% showed at least mild HL and duration of DM and sensorineural hearing loss at 2000Hz and 4000Hz showed statistically significant correlation [5]. According to Treviño-González in cases with duration of DM >5 years prevalence of HL was 33%, while of the patients < 5 years had normal hearing [15]. Irshad et al. reported that association of SNHL and complicated DM, was strengthened by the presence of retinopathy, younger age group, HbA1C >7%, but no effect of high blood pressure. [19]. Also, Gutierrez J et al. reported that at age 60 years and below, retinopathy was significantly associated with SNHL [10].

DM is as common problem with a high prevalence [2] and a very high prevalence of HL of 46.1% noted in the present study, which highlights the fact that hearing assessment needs to be done as a routine procedure in diabetics. Meena R et al. also concluded in their study that audiological investigations, need to be considered as a routine procedure for patients with DM [14].

With a high prevalence of HL in DM of 46.1% in the present study it is recommended that preventive measures to control diabetes and early assessment of HL in diabetics should be included in the national health policy to minimize the burden of the disease.

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## Conclusion

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There is high prevalence of SNHL in patients suffering from diabetes mellitus in the region and an association between DM and HI has been noted. Therefore, diabetic population should be routinely screened for HI.

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# Shisha use and trends in Pakistan: A narrative review

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Shisha smoking is a growing global epidemic and a preventable cause of mortality and morbidity. Shisha use is popular among youth worldwide constituting a voguish social trend. It is widely regarded as less hazardous and more acceptable than cigarette smoking. However, research evidence has highlighted numerous harmful effects of shisha smoking. A literature review was conducted to identify all available research related to shisha smoking in Pakistan. "Pubmed" and "Google Scholar" were employed as search engines. This review presents and evaluates evidence regarding trends, patterns, knowledge, beliefs and usage of shisha in Pakistan. It culminates with recommendations to increase awareness of shisha and preventive strategies to combat this significant public health issue in Pakistan.

**Keywords:** *Shisha, Sheesha, Hubble bubble, Hookah, Waterpipe, Smoking*

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## Introduction

Shisha smoking is a centuries old practice with high prevalence in the Eastern Mediterranean Region [1]. Rising exponentially over the past decade, shisha smoking is now a worldwide epidemic [2]. It is known by different names across the world including "sheesha", "water pipe", "hubble bubble", "hookah" and "narghile" [3]. Although it is more prevalent in males [2] its usage has been increasing in females [4]. Shisha use is the highest among school and university students globally [5]. Shisha smoking has become a social event with people gathering to smoke in cafes and restaurants [6]. Adding to its appeal and popularity is the fact that shisha is available in sweetened form and in a variety of flavours [7,8].

A common misconception is that shisha smoking is less harmful than cigarette smoking to health [9]. Research has demonstrated that smoke from Shisha comprises of a cocktail of lethal toxicants present in cigarettes including nicotine, aromatic hydrocarbons, volatile aldehydes and carbon monoxide [10]. Shisha smoking can also serve as a precursor to future cigarette use among youth [11]. According to the World Health Organization, tobacco causes greater 7 million deaths annually worldwide [12].

The components of shisha or a waterpipe include its body, tobacco bowl, water bowl, hose and a mouthpiece [13]. The tobacco is placed in the tobacco bowl and the smoke passes through water before it is inhaled through the mouthpiece [13]. The mouthpiece is often shared between people which can facilitate the spread of communicable diseases such as tuberculosis [14]. Shisha smoking increases the risk of certain types of cancers, including lung and oesophageal cancer [15]. A substantial body of literature has established a positive association between shisha smoking and respiratory diseases such as chronic obstructive pulmonary disease and bronchitis, low birthweight, cardiovascular disease and metabolic syndrome [16]. Second hand smoke from shisha also poses health risks to the general public [17,18]. Current policies and regulations regarding the control of shisha are inadequate and insubstantial, which has propagated its spread [19, 20].

In Pakistan, smoking is a significant public health issue and shisha use is ubiquitous [21]. Shisha smoking is deemed culturally and socially acceptable [21]. According to results of Global Adult Tobacco Survey, there were about 3.7 million shisha users in Pakistan in 2014 [22]. The aim of this review is to find all published literature on

shisha smoking in Pakistan to highlight its prevalence, sociodemographic characteristics, age and gender distribution, reasons for smoking, patterns of usage and trends.

## **Methodology**

Articles were searched using the search engines of "Pubmed" and "Google scholar" by employing the terms "shisha", "water pipe", "hubble bubble", "hookah" "narghile" and "arghile". The reference list of retrieved articles was surveyed to find articles related to the topic. Variant spellings of key words for example "sheesha" and "hukka" were also used. No time limit was imposed while searching. All search results comprising published original articles and reviews in the English language are included.

## **Results & Discussion**

### **Prevalence:**

The prevalence of shisha usage is high in Pakistan. A large scale cross-sectional survey conducted on 7582 students aged 20-25 years belonging to various institutions from multiple cities of Pakistan determined the overall prevalence of shisha smoking as 19.7% [23]. In another cross-sectional study conducted among 450 students at two medical and two non-medical universities in Karachi, 53.6% students were shisha smokers [24]. Two studies carried out in medical students in Pakistan reported prevalence rates of 21.5% [25] and 19% [26]. Other studies conducted among university students cited frequencies of 45.2% [27] and 48% [28]. In Pakistani adolescents aged 13-17 years the rate of shisha smoking was 39% [28]. In a study involving medical practitioners in Pakistan, 29.5% admitted to shisha smoking at some point in their lives [29]. A cross-sectional descriptive study executed in four cities of Pakistan including Karachi, Islamabad, Rawalpindi and Peshawar at shisha cafes, shopping malls and restaurants found a higher prevalence of 61% [30]. A study performed in a small semi urban community of Karachi revealed that 13% adults smoked shisha [31].

### **Gender and age distribution:**

A sizable majority of studies have indicated that shisha smoking is significantly more common in males than females in Pakistan [23-27, 30- 32]. The literature body has also demonstrated that shisha smoking is

primarily associated with youth in Pakistan. This finding is corroborated by studies in other parts of the world [33]. Shisha smoking in Pakistan usually starts in adolescence and early twenties and the average age of initiation varying from 14 years [34] to 24 years [26]. Most studies conducted in Pakistan cite a mean age of around 18 years [23, 24, 26].

### **Socio-demographic distribution:**

According to the results of a large scale study involving 71 educational institutions in multiple cities of Pakistan, the highest prevalence of shisha smoking is in Federal Capital Islamabad [23]. Shisha smoking rates were more in professional and private educational institutions and students belonging to higher socio-economic class while students studying in religious institutes or madrasas did not smoke shisha at all [23]. In a study conducted at several multidisciplinary colleges, higher rates of shisha smoking were seen in non-medical students as compared to medical students [24]. In another study comparing public and private medical colleges, shisha use was significantly higher in private institutes [25]. A research study carried out on adolescents aged 14-19 years revealed that shisha smoking was more common in those who belonged to higher socio-economic background [34]. The association between Shisha use and higher socio-economic class may be attributed to its perception of a status symbol as well as its accessibility and cost.

### **Reasons for shisha smoking:**

The most commonly quoted reasons for shisha smoking among students and youth are pleasure-seeking [23, 24, 27, 30, 32], curiosity [23, 24, 26, 27, 30, 32], peer-pressure [23, 24, 25, 26, 27, 28, 30, 32], boredom [23, 24, 27, 30, 32] and stress [24, 27, 30, 32]. Other given reasons are influence of media [23], easy availability of shisha [24], considering shisha smoking as more tolerable than cigarette smoking [28] and cogitating it as a status symbol [28]. In a study conducted in two medical universities in Karachi, some students voiced that they were influenced by family members while others thought it was glamorous to smoke shisha [25].

### **Knowledge, Attitude and Practices:**

Similar to research results in other parts of the world [35], shisha smoking is perceived as less harmful than



cigarette smoking in Pakistan [23, 24, 27, 28, 30, 32, 34]. In only two studies the majority of participants regarded the hazards of shisha comparable to that of cigarettes [25, 26]. In a large scale multicentre study involving over seven thousand students only 3% were aware of the constituents of shisha [23]. In another study carried out at four different universities, around 17% of the study participants were unable to recognize a single harmful consequence of shisha smoking [24]. However, research revealed that the common misconception that shisha is filtered due to water in the shisha pipe was generally regarded as false in Pakistan [25, 26].

The most common place where shisha is smoked are shisha bars or cafes [23, 25, 26, 34] which demonstrates that shisha smoking is a considered a social event in our population and shisha bars play a vital role in promotion of shisha smoking. This is in agreement with findings from other parts of the world [35]. A single waterpipe is frequently shared between shisha smokers [24, 26, 27, 34] which constitutes an important health hazard. Flavour is important attribute of shisha which is liked by our youth [24, 34]. An alarming trend in Pakistan is that parental approval is usually given to youth for shisha smoking [23, 24, 26, 27]. This is likely due to the fact that shisha is not considered harmful to health by parents.

Research has demonstrated that higher rates of shisha smoking are found in those individuals who smoke cigarettes [23, 25, 27, 28, 30]. Smoking either shisha or cigarettes can act as a gateway to the other substance. A study comprising of randomly selected students from various institutions in Karachi divided them into two groups; the first group comprised students aged 13-17 years and the second group encompassed 23-27 years old university students. In the first group, among the students who smoked both cigarettes and shisha, the majority started shisha first and then proceeded on to cigarettes whereas in the second group most students started cigarettes which then led to shisha smoking [28]. In other studies, respondents stated that they started shisha smoking because they were previous cigarette smokers [27, 30]. In a study involving medical students, it came to light that shisha users abused harmful substances such as narcotics and cannabis in addiction to tobacco in water-pipes [26].

A study conducted among medical students in Karachi found out that the majority was unaware of a legislation prohibiting shisha smoking in Pakistan, and even after being informed about the legislation only 22% students voiced their intention to quit or decrease shisha use [25]. Similarly, in other studies only a minority of students had any intent to stop shisha smoking [24, 30]. Even among shisha-using medical practitioners, the majority was not ready to quit [29].

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## Conclusion

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Shisha smoking is widespread among youth and students in Pakistan and it is considered a trendy social and recreational practice. Knowledge regarding shisha and its hazardous effects is deficient in our country. More worrisome is the fact that awareness levels are low in the educated population. A commonly held belief is that shisha smoking is less harmful than cigarette smoking. Pakistani youth are usually given parental approval for shisha smoking and the age of initiation of shisha use is low which can potentially cultivate a lifelong harmful habit. Attitudes towards quitting this addiction are largely negative. Regulations against shisha use are lax and there is lack of awareness among the public regarding its legislation.

There is a pressing need to raise awareness and impart health education about the dangers and hazards of shisha smoking. This can be done through public awareness programs and targeted campaigns for high risk groups. Since boredom and pleasure-seeking are commonly cited factors for shisha smoking, it is imperative that healthy forms of entertainment are available for youth in our country. Surveillance and monitoring of shisha use and enforcement of strict legislation is necessary to address this growing public health concern. Further research should also be conducted to help develop appropriate interventions and policies to tackle the menace of shisha smoking in Pakistan.

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# Torsion of lesser omentum: A rare presentation of acute abdomen

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## Author's Contribution

<sup>1,3</sup> Conception, synthesis, planning of research and manuscript writing

<sup>2</sup> Planning of research

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## A B S T R A C T

Intraperitoneal Focal Fat Infarction is a rare cause of acute abdomen. There are two types, Omental Torsion and Epiploic Appendagitis. We present a case of 19 years old male who presented to ER with severe pain in epigastrium and right iliac fossa. Clinical diagnosis of acute appendicitis was made, but epigastric pain remained unexplained. CT scan was reported as non-significant. Diagnostic Laparoscopy picked lesser omental infarction and acute appendicitis. Patient was successfully managed by Laparoscopic Surgery. Symptoms not explained by a single pathology should be thoroughly investigated. CT Scan is the best investigation. Laparoscopic surgery is an effective and safe approach for small segmental omental torsion.

**Keywords:** Abdominal Pain, Omentum, Torsion, CT Scan, Laparoscopic Surgery

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## Introduction

In 1999 van Breda Viersmann introduced the term IFFI (Intraperitoneal Focal Fat Infarction) to widely describe various conditions like torsion/infarction of greater or lesser omentum and epiploic appendage. Their symptoms differ depending on various anatomical positions but focal fat tissue necrosis is common in all [1, 2]. Eitel described the Omental Torsion in 1899. A small number of cases have been reported since then. Men are 5 times more vulnerable than women as the latter can store more adipose tissue. Only 0.1 % cases have been reported in children [3].

We are presenting a case with a rare combination of pathologies i.e. Lesser Omental Infarction and acute appendicitis.

## Case report

A 19 years old male presented to Emergency Department of our hospital with complaints of abdominal pain, which initially started in epigastric region and later

on involved right iliac fossa for the past 4 days. Pain was gradual in onset, colicky in nature, reached score 7/10 and relieved by oral analgesics. He did not refer any complaints of nausea, vomiting, diarrhea, fever or urinary symptoms.

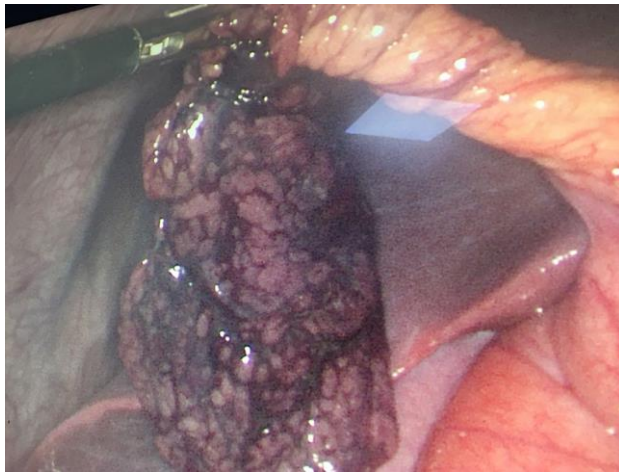
On physical examination his blood pressure was 110/70 mmHg, heart rate of 85 beats per minute, respiratory rate of 20 breaths per minute and temperature of 37 °C. On palpation of the abdomen he had tenderness and guarding in the epigastric region as well as right iliac fossa.

Laboratory investigations revealed total leukocyte count of 9300, Hemoglobin 12.8 g/dl, platelets 240000, glucose 108 mg/dl and creatinine 0.86 mg/dl. C - reactive protein was 1.43. Serum electrolytes were normal and Urine dipstick was negative.

A computed tomography (CT) scan of abdomen and pelvis was done in the evening which was reported by resident as inconclusive for appendicitis or any other

pathology. Despite using conventional analgesia, the patient had no relief of symptoms, so he was started on intermittent intravenous opioids.

As patient's clinical condition was not improving and diagnosis was uncertain, we decided to perform diagnostic laparoscopy. A segment of lesser omentum attached to the lesser curvature of stomach was rotated at 720 degrees around its own axis in the clockwise direction; part of omentum distal to level of rotation was gangrenous (Fig. 1-3).



**Figure 1: A laparoscopic view of the torsion of lesser omentum with distal infarction.**



**Figure 2: Another laparoscopic view of infarcted segment of lesser omentum.**



**Figure 3: The specimen of infarcted lesser omentum after excision.**



**Figure 4: The infarcted lesser omentum as well as appendix showing multiple fecoliths and signs of inflammation.**

Appendix was acutely inflamed. Laparoscopic partial omentectomy and appendectomy were performed (Fig.4). The specimens were sent for histopathology. There was no other pathology detected in the abdominal cavity on laparoscopy. Patient remained stable postoperatively and was discharged home on 1st postoperative day. Patient came for follow up after one week and had recovered completely. Histopathology showed infarction,



hemorrhage and congestion on the omentum. The appendix was reported as acutely inflamed with multiple fecoliths.

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## Discussion

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Torsion of the lesser omentum is an extremely rare condition which presents as acute abdomen. It is an infrequent entity appearing as Intraperitoneal Focal Fat Infarction.

Donhauser and Loke classified the omental torsion into "primary" and "secondary" 4. Secondary torsion is relatively more common than primary torsion and is usually associated with cystic lesions, tumours, hernias and intra-abdominal inflammatory processes [5].

It can also be classified as Unipolar torsion in which proximal part of the omentum remains fixed and Bipolar torsion in which both proximal and distal part of the omentum remain fixed [6].

Its diagnosis is difficult as there are no characteristic signs and symptoms. It can mimic variety of other pathologies like appendicitis, perforated duodenal ulcer, cholecystitis and diverticulitis [1, 2, 6].

The pathophysiology of primary omental torsion is not clear. Adams classified the pathogenesis of the primary omental torsion into two types of factors: Predisposing factors like Anomalies of omental blood vessels and obesity and Precipitating factors such as Hyperperistalsis, sudden changes of position like twisting movements of body, trauma, overeating and use of laxatives [7].

Clinical presentation may include nausea, vomiting, abdominal pain and low grade fever. It may cause signs of peritoneal irritation depending upon its location into the abdominal cavity. Leukocytosis may or may not be present [8].

As clinical diagnosis of this pathology is difficult so preoperative Ultrasound and contrast enhanced CT scan must be considered, though in many cases radiological findings may miss the diagnosis [7]. In our case, contrast enhanced CT was initially reported by on-call resident of radiology overnight was inconclusive. A review done the next morning by senior radiologist confirmed the laparoscopic diagnosis of omental infarct. A high index of suspicion is needed by the surgical team and proper

reporting of clinical features to the radiology team can help make a pre-operative diagnosis in such cases.

While small infarcts picked up on imaging can be managed conservatively, laparoscopic management is required in cases with major infarcts as in our case or if diagnosis remains uncertain [9, 10].

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## Conclusion

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Symptoms not explained by a single pathology should be thoroughly investigated by different imaging techniques. CT Scan is the best investigation for the diagnosis of such rare pathologies. A high index of suspicion is needed by the surgical team and proper reporting by the radiology team can help make a pre-operative diagnosis in such cases. Laparoscopic surgery is an effective and safe approach for small segmental omental torsion.

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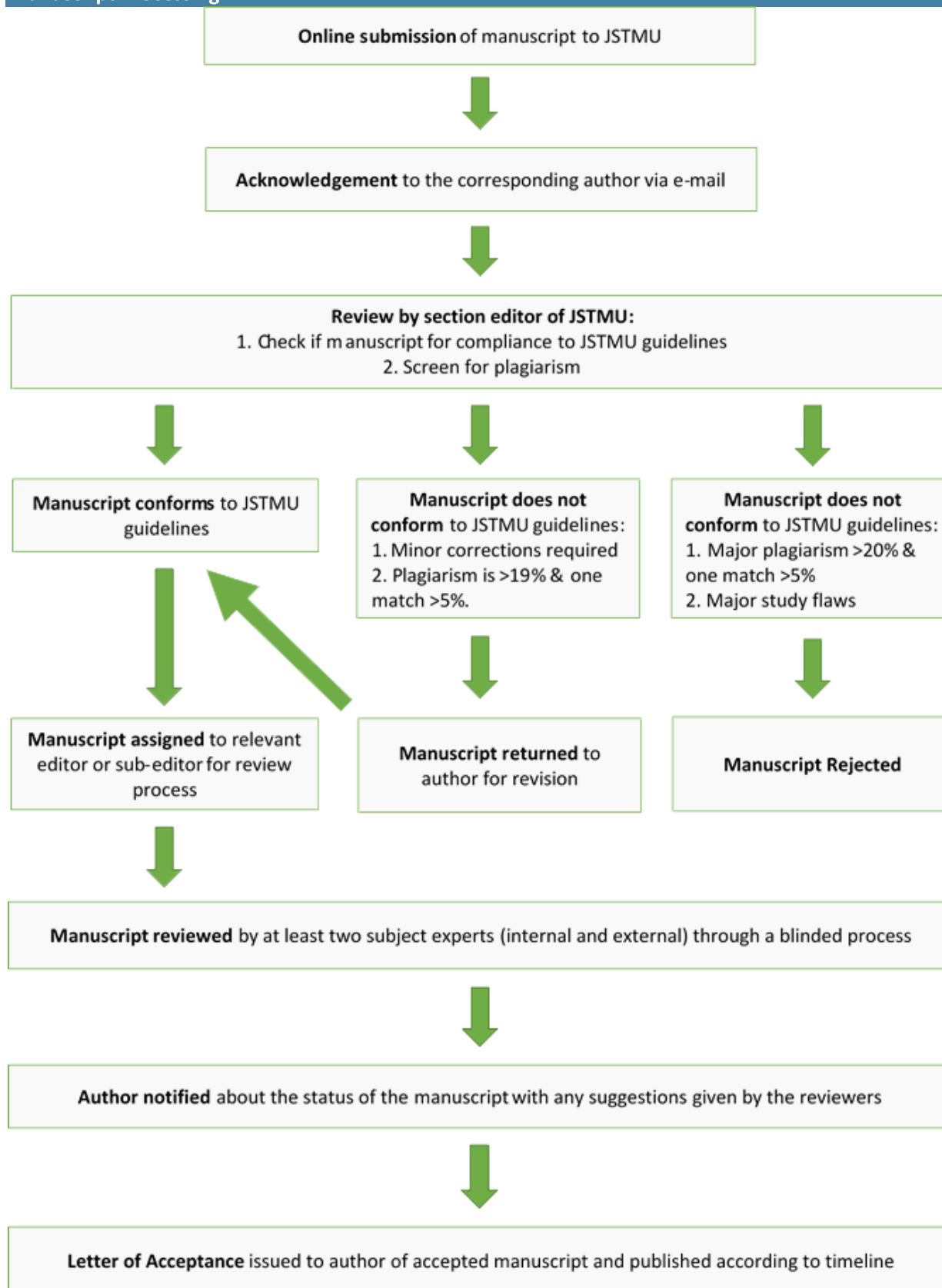
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In cases of suspected research or publication misconduct, it may be necessary for the Editor to contact and share manuscripts with third parties, for example, author'(s) institution(s) and ethics committee(s). JSTMU may also seek advice from ICMJE and discuss anonymized cases in the ICMJE Forum. The editor may also involve ICMJE independent ombudsman.

### Commercial organizations

Authors from pharmaceutical companies, or other commercial organizations that sponsor clinical trials, should declare these as competing interests on submission. They should also adhere to the Good Publication Practice guidelines for pharmaceutical companies (GPP3), which are designed to ensure that publications are produced in a responsible and ethical manner. The guidelines also apply to any companies or individuals that work on industry-sponsored publications, such as freelance writers, contract research organizations and communications companies.

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The Editorial team is responsible for the decision to reject or recommend the manuscript for publication. This decision will be sent to the author along with any recommendations made by the reviewers. After acceptance, it takes around 1-2 months to publish the article online, and a few weeks later this is compiled into an online volume and issue. The print copy follows within 3 months of acceptance of manuscript.

Initial decision to review	1-2 weeks after submission
Decision after review	6-8 weeks after submission
Anticipated timeframe for suggested revisions	3-4 months (with flexibility if needed)
Time to online publication	1-2 months after acceptance
Time to print publication	Within 3 months of acceptance

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An article based on dissertation can be sent for publication provided that the data is not more than three years old. A copy of approval letters of synopsis and dissertation obtained from the review board must be submitted with the research paper. Dissertation based articles should be re-written in accordance with the journal's instructions to the author guidelines.

Article shall undergo routine editorial processing including external peer-review based upon which final decision shall be made for publication. Such articles, if approved, shall be published under the disclosure by author that 'it is a Dissertation based article'.

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**INSTRUCTIONS FOR AUTHORS**

The manuscript(s) submitted to JSTMU should not be more than allowable words limit (mentioned in relevant sections below) and NOT more than 5 Tables and/or figures excluding abstract (250 words), acknowledgments and references. The text of the manuscript should be doubled spaced with one-inch margin on all sides. The font should be in size 12 Times New Roman and all pages should be numbered. A certificate, signed by the author and co-authors should be accompanied along with the manuscript stating that the article has been read and seen by all authors and have not been submitted or published in another journal or elsewhere in a report or textbook. Any copyright material, if used, should be accompanied with a permission letter from the copyright owner by the corresponding author. The manuscript should be checked for spelling and grammatical errors before submission. Authors should write the Keywords in the manuscript below the abstract. \*

**A. Original Research Articles**

The Journal considers original articles that are, cohort study, case-control study, clinical trials, intervention study, epidemiological assessment, cross-sectional study, meta-analysis, cost-effective analysis, decision analysis, study of screening and diagnostic test, other observational studies, and qualitative studies such as focus group discussions, in-depth open-ended survey etc. Articles based on thesis maybe submitted provided the data is not more than three years old.

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 as NUMERICAL with parentheses i.e., [1] and should appear BEFORE punctuation marks (.,;:?!“ etc.) in the text/sentence. The final bibliography should be in the order in which they are quoted 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.<sup>1</sup>

#### 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.

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

**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.

### F. Letters to Editor

Letters should only be written on a specific article in the most recent publication of journal. The letter should be objective and provide constructive opinions offer some academic or clinical interest to the readers.

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.

### G. Editorial

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.

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