

Impact of Medical TV Shows on the Surgical Knowledge of Non-Healthcare Students of Lahore, Pakistan

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Purpose: A popular genre of television shows is medical dramas. Although the primary objective of watching these shows is entertainment, acquiring medical knowledge is a passive by-product. Surgical procedures constitute a large part of the storyline of these shows. This could either serve as a source of medical knowledge or provide false information, the effect being especially important in individuals with no prior medical exposure. This study assesses the impact medical TV shows can have on the surgical knowledge of non-healthcare students and the difference in knowledge between different demographic groups (among those with relatives in the medical community and those without).

Methods: A cross-sectional study was conducted among the non-healthcare students of Lahore, Pakistan. A self-administered questionnaire was used containing socio-demographic factors (age, gender, educational discipline), history, and hours of medical TV shows watched. It also contained ten questions each with a score of 1 to assess surgical knowledge. Data were analyzed using SPSS v.26.

Results: Among the 1097 respondents, 450 (41%) had a history of watching medical TV shows. The majority, 319 (29.1%), had seen these shows for < 24 hours. The mean score of all respondents was 5.79 out of a maximum score of 10. Respondents with a history of watching medical TV shows were more knowledgeable than those who did not ($p < 0.001$). Similarly, respondents with a history of watching more hours of medical TV shows were more knowledgeable than those who watched for a lesser number of hours ($p < 0.001$). Respondents with relatives in the healthcare profession were also more knowledgeable than those without ($p = 0.049$).

Conclusion: If properly developed, while maintaining their primary entertainment value, medical TV shows can also be used as efficient learning tools. Quality controls must also be applied to minimize the risk of false information.

Keywords: medical television, knowledge, non-healthcare students, medical education

Introduction

Television has always had a lasting impact on its audience and a vital role in shaping society since it affects public perception on a wide range of topics.¹ Increased screen time for today's generation, the rise of streaming platforms such as Netflix, and the option to download shows for later viewing, are factors that have contributed to an increase in television viewership. One of the most popular television genres is medical dramas.² Medical dramas are shows that revolve around a medical setting such as a hospital, a clinic, or an ambulance. Since the first medical TV show called "City Hospital" aired in 1952, they have become increasingly popular.³ Consequently, television continues to be the popular source of information on health despite the presence of the Internet.⁴ Although the primary objective of viewing these shows is entertainment and acquiring medical information is a passive by-product, entertainment media may be viewed with the purpose of gaining information as well.

Medical shows like “Grey’s Anatomy (ABC)”, “House (Fox)”, “ER (NBC)”, “The Good Doctor (ABC)”, and “The Resident (Fox)”⁵ among others have huge audiences. All of these shows are also available to stream in Pakistan. The latter two are recent and gaining popularity. The majority of these TV shows have surgical procedures as an important part of their storyline because of a certain dramatic effect associated with them. As a result, surgical knowledge is bound to be imparted. This is similar to how television is likely to be the source of information for patients regarding physicians, treatment, and hospitals.⁶ At times, however, the dramatic effect of surgery may be exaggerated to capture the audience’s interest.⁷ Therefore, while the knowledge imparted can be very useful, it may also lead to the diffusion of incorrect information.

In accordance with the cultivation theory, people tend to perceive the world’s realities as put forward by the media they are exposed to for longer periods.⁸ Knowledge from these shows may be used to make healthcare decisions for one’s family or become the basis for self-medication.⁹ Additionally, television has a stronger effect on viewers’ conceptions in areas where they have limited knowledge and expertise.¹⁰ As a result, medical dramas play a more prominent role in adding to the medical knowledge of people with non-healthcare backgrounds.

The primary objective of this study is to determine whether non-healthcare students who watch medical TV shows are more or less knowledgeable about surgical interventions and techniques compared to those who do not, and to judge the accuracy of this knowledge. Consequently, we will be able to determine whether TV shows can be an essential component of increasing medical and surgical knowledge of the population (who are potential patients) as well as any content improvements that are necessary to ensure accuracy and authenticity. The secondary objective is to evaluate whether a difference exists between demographic subgroups due to gender and age between those with relatives in the medical community and those without.

Materials and Methods

Study Design

This cross-sectional study was carried out in Lahore, Pakistan from May 2022 to July 2022. The non-probability purposive sampling technique was used. Any student who self-reported studying non-healthcare curricula, who understood the English language and had internet access, was included in the study. Any student studying healthcare or other related curricula such as MBBS, BDS, and veterinary sciences, was excluded. A total of 1133 participants took part in the study, 36 of whom were excluded as they were related to the healthcare profession. The remaining 1097 responses were analyzed.

Survey Design

Data was collected through an online self-reported questionnaire divided into three parts: a consent form, various demographics along with a history of watching medical TV shows, and an assessment of surgical knowledge. Participation was voluntary and participants were informed of the purpose of the study. They consented to be a part of the study prior to filling the questionnaire; participants under 18 years of age were approved by the IRB to provide informed consent on their own behalf. Confidentiality and anonymity were thoroughly ensured and no names or email addresses were asked. All social and ethical considerations were given due care and importance. Surgical knowledge was assessed by 10 multiple-choice questions (Table 2), made by reviewing literature and viewing medical TV shows. Correct answers (shown in bold) were scored 1 out of 1, and incorrect answers were scored 0 out of 1.

Study Circulation

Ethical approval was obtained from the Institutional Review Board (IRB), FMH College of Medicine and Dentistry, Lahore under the reference number FMH-11/03/2022-IRB-1020. The questionnaire was disseminated through Facebook, Instagram, WhatsApp, Email, Twitter, and text messages by members of the research team. Participants were requested to further roll out the survey to as many people as possible, disregarding age and gender.

Statistical Analyses

Respondent demographics, history of watching medical TV shows, hours of medical TV shows watched, and exposure to the medical profession were reported using descriptive statistics such as frequency and percentage. Surgical knowledge was assessed based on the total number of correct answers out of 10. Average medical knowledge was presented as mean and standard deviation. The average surgical knowledge within different participant groups, such as gender, age, and history of watching medical TV shows, were compared using the independent samples *t*-test. For exposure to the medical profession, the educational discipline the participants belonged to, and the number of hours for which the participants had seen medical TV shows, the groups were compared using the one-way ANOVA test. *p*-values less than 0.05 were considered statistically significant. All statistical analyses were conducted using Statistical Package for Social Services (SPSS v.26).

Results

Out of the 1097 responses that were analyzed, approximately 61%, 38%, and 0.5% identified themselves as female, male, and other respectively. The vast majority of individuals (83.7%) belonged to the discipline of science and engineering. 450 of the respondents had seen at least one medical TV show, out of which a further 45 had seen them for more than 72 hours. These demographics are displayed below (Table 1).

Table 1 Respondent Demographics

		n = 1097 (%)
Gender	Male	419 (38.2)
	Female	673 (61.3)
	Other	5 (0.5)
Age	13–17 years	726 (66.2)
	18–24 years	332 (30.3)
	>24 years	39 (3.6)
Educational Discipline	Science and Engineering	918 (83.7)
	Humanities and Social Sciences	60 (5.5)
	Business and Entrepreneurship	52 (4.7)
	Education and Research	22 (2.0)
	Law	14 (1.3)
	Other	31 (2.8)
Exposure to medical profession	Close Relative	575 (52.4)
	Distant Relative	179 (16.3)
	Friend	59 (5.4)
	None	284 (25.9)

(Continued)

Table 1 (Continued).

		n = 1097 (%)
History of watching TV shows	Yes	450 (41.0)
	No	647 (59.0)
Hours of TV shows watched	< 24 hours	319 (29.1)
	24–72 hours	86 (7.8)
	>72 hours	45 (4.1)
	None	647 (59.0)

The distribution of responses for each question that assessed surgical knowledge is also shown (Table 2). The highest number of responses were for the correct answers to all questions. The mean score of all respondents was 5.79 out of a maximum score of 10. Respondents with a history of watching medical TV shows were more knowledgeable than those who did not ($p < 0.001$) (Table 3). Similarly, respondents with a history of watching more hours of medical TV shows were more knowledgeable than those who watched them for a lesser number of

Table 2 Survey Responses

Scalpel is used to:	
• Stitch a wound	108 (9.8)
• Pry apart skin during surgery	415 (37.8)
• Make an incision on the body	481 (43.8)
• Grasp tissue	93 (8.5)
Amputation is:	
• Surgically cutting off a limb	707 (64.4)
• Administering a pain killer	53 (4.8)
• Abnormality in the ampulla of the uterus	272 (24.8)
• Blood loss in a limb	65 (5.9)
What is a biopsy?	
• To operate on a tumor	270 (24.6)
• To surgically excise a tissue	515 (46.9)
• To make an incision	78 (7.1)
• To take a radiograph	234 (21.3)
Hysterectomy is:	
• Removal of uterus	547 (49.9)
• Treating hysteria	404 (36.8)
• Removal of breast	53 (4.8)
• Removal of spleen	93 (8.5)

(Continued)

Table 2 (Continued).

The epidural drug is administered via:	
• Blood directly	261 (23.8)
• Spine	521 (47.5)
• Skin	223 (20.3)
• Orally	92 (8.4)
Appendix is removed from:	
• Right lower abdomen	762 (69.5)
• Left lower abdomen	283 (25.8)
• Below the lungs	32 (2.9)
• Pelvis	20 (1.8)
What is rhinoplasty?	
• Surgery done on the spine	179 (16.3)
• Surgery done on the nose	794 (72.4)
• Surgery done on the humerus	94 (8.6)
• Surgery done on the eye	30 (2.7)
What is laparoscopy?	
• Non-invasive surgery	435 (9.7)
• A form of X-Ray	259 (23.6)
• Intestinal excision	287 (26.2)
• Transplant surgery	116 (10.6)
What does intubation mean?	
• Insertion of a tube into the airways to assist in breathing	814 (74.2)
• Intravenous injection of medicine or anesthesia	120 (10.9)
• Induction of coma for a certain period of time	131 (11.9)
• Type of blood test	32 (2.9)
What is suction in surgery?	
• Discarding a foreign object from the body	198 (18.0)
• Excising tumor from the body	79 (7.2)
• Removing excess blood from the site of operation	779 (71.0)
• Placing the patient under ventilator	41 (3.7)

Notes: The correct answers for the questions about surgical knowledge have been bolded.

hours ($p < 0.001$) (Table 4). Tukey's post hoc test shows that the significant differences in surgical knowledge were between the groups who did not watch medical TV shows and those who watched them for < 24 hours, 24–72 hours, and > 72 hours with p-values of 0.008, 0.009, and 0.005 respectively. Differences in surgical knowledge

Table 3 Comparison of Medical Knowledge of Cohorts (t-test)

Cohorts	Mean \pm SD	p-value
Overall	5.79 \pm 2.297	-
Gender		0.561
• Male	5.74 \pm 2.285	
• Female	5.83 \pm 2.298	
Age Group		0.642
• < 18 years	5.77 \pm 2.324	
• > 18 years	5.84 \pm 2.246	
History of watching medical TV shows		< 0.001
• Yes	6.16 \pm 2.177	
• No	5.54 \pm 2.345	

Table 4 Comparison of Medical Knowledge of Cohorts (One-Way Anova Test)

Cohorts	Mean \pm SD	p-value
Overall	5.79 \pm 2.297	-
Educational Discipline		0.415
• Science and Engineering	5.85 \pm 2.253	
• Humanities and Social Sciences	5.42 \pm 2.701	
• Business and Entrepreneurship	5.67 \pm 2.455	
• Education and Research	5.32 \pm 2.418	
• Law	5.86 \pm 2.413	
• Other	5.26 \pm 2.366	
Exposure to medical profession		0.049
• Close Relative	5.97 \pm 2.285	
• Distant Relative	5.47 \pm 2.272	
• Friend	5.66 \pm 2.154	
• None	5.67 \pm 2.347	
Hours of TV shows watched		< 0.001
• < 24 hours	6.03 \pm 2.164	
• 24–72 hours	6.36 \pm 2.136	
• > 72 hours	6.71 \pm 2.273	
• None	5.54 \pm 2.345	

were statistically insignificant between the other groups. Respondents with relatives in the healthcare profession were also more knowledgeable than those without ($p = 0.049$) (Table 4). Tukey's post hoc test also exhibits that the significant differences in surgical knowledge were between the groups that had close relatives and the group

that had distant relatives in the medical profession with a p-value of 0.05. Differences in surgical knowledge were statistically negligible between the other groups.

Discussion

To the best of our knowledge, this is the first study to investigate the effect of medical TV shows on the surgical knowledge of non-healthcare students. A similar study¹¹ has been carried out previously to assess medical knowledge. Since many shows (Grey's Anatomy, The Good Doctor, and The Resident) revolve primarily around surgery and operating rooms, questions about surgical interventions were considered a better assessment of the knowledge gained through their viewership. Junior doctors and physicians have also reported watching these shows for educational purposes.¹²

The two most significant associations with surgical knowledge ($p < 0.001$) were the history of watching TV shows and the number of watch hours. Another significant variable ($p = 0.049$) was the respondent's prior exposure to the medical profession, such as that through a relative or a friend. The respondent's age group, gender, and educational discipline were insignificant factors for this study. The reason for this could be two-way:¹¹ greater interest in medical TV shows results in an increase in knowledge or greater knowledge results in a greater interest in medical TV shows. Similarly, it is also possible that people with relatives or friends in the medical community had greater knowledge, or it could have aroused their interest in medical TV shows which led to greater knowledge. Although these findings are not supported by our study, this could be an avenue for future research. An increase in the hourly viewership could be explained by the fact that binge-watching is more common today than it was in the past.¹³

The average American has an approximate screen time of 7 hours per day. 93.5% of these Americans use the Internet to stream TV shows and movies.¹⁴ Some of the highest-rated shows among these are medical in nature. Especially during the recent COVID-19 pandemic, lockdown and limited social interaction have increased media consumption for both television and social media.¹⁵ Traditional TV is dying out as people have become increasingly used to watching entertainment shows and movies on the Internet. This factor is irrelevant in the context of Pakistan as no local medical TV shows have been produced. Hence, the Internet has always been the prime source of medical TV show viewership in Pakistan. Pakistan provides huge audiences to platforms like Netflix and Amazon Prime. This is consistent with our findings, which show that 41% of non-healthcare students out of a random sample have a history of watching medical TV shows. This applies to individuals belonging to the medical profession as well. One study¹⁸ suggests that approximately 80% of medical and nursing students view these shows.

An increase in the knowledge of individuals watching medical TV shows, as opposed to those who do not, makes it easy to infer that entertainment is not the only outcome. Entertainment media has always been a powerful education tool. This is owed to the fact that prime-time TV shows have enormous audiences and also because these audiences are more likely to learn from engaging storytelling with drama and fiction rather than traditional health sources where knowledge is being imposed on them.² Medical e-learning is already a valuable source of knowledge today.^{16,17} This, coupled with our study's findings, implies that such shows may be used as learning or teaching tools if properly developed. Fictional medical television is underutilized in education.¹⁹

The results of this study can have far-ranging implications. The quality of information imparted is a bigger factor than the presence of information.⁹ While these TV shows may play a significant role in educating the masses about health issues and basic healthcare, carelessness may lead to quite the opposite effects. An unfortunate effect of such shows is that people use them to gauge the benefits and risks of health measures and medicinal products.⁹ While that cannot be changed, certain quality controls can be applied to minimize the risk it might carry. According to one study, these shows have falsely portrayed the appropriate use of an automated external defibrillator.²⁰ This makes it crucial for regulatory bodies such as American Heart Association (AHA) to ensure proper education. For storyline and entertainment purposes, TV shows portray healthcare professionals making mistakes. As the cultivation theory suggests, this could make patients more hesitant about seeking medical treatment and increase medico-legal cases.⁷

Limitations of our study include inherent limitations associated with a cross-sectional study design. Since exposure and outcome are assessed simultaneously, there is no evidence of a temporal relationship between them.²¹ Additionally, the surveyed respondents may not represent the views of the general public. This could be solved by increasing the

sample size. Expanding the study population to different countries may provide us with better results. Regression analysis could also be carried out in future studies to control potential co-variables.

Conclusion

If properly developed, while maintaining their primary entertainment value, medical TV shows can also be used as efficient learning tools. Quality controls must also be applied to minimize the risk of false information.

Ethics Statement

Ethical approval was obtained from the Institutional Review Board (IRB), FMH College of Medicine and Dentistry, Lahore under the reference number FMH-11/03/2022-IRB-1020.

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Disclosure

The authors report no conflicts of interest in this work.

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