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RESEARCH

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Knowledge and awareness of undergraduate medical students regarding palliative care in Pakistan: a cross-sectional study

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Abstract

Objectives Our study assesses the current knowledge and prior awareness of undergraduate medical students in Pakistan regarding palliative care.

Study Design This descriptive Cross-sectional online survey was distributed among undergraduate medical students across Pakistan, with a sample size of 246 participants. The questionnaire, adapted from the PaCKS questionnaire by Kozlov et al. (JAMA 15(5):524–34, 2017), was designed to assess the students' prior knowledge about palliative care.

Results The mean PaCKS score was 9.7 out of 13, with a standard deviation of 2.76. Having heard of palliative care before participation in the study was significantly associated with higher PaCKS scores. Key factors associated with a higher incidence of prior awareness of palliative care included attending private institutions, being in a more advanced year of study, and having a higher mean monthly family income ($P < 0.001$ for each factor).

Conclusion This study explores medical students' understanding of palliative care in Pakistan, finding that while many have a basic grasp of the concept, there are notable misconceptions, particularly in differentiating palliative care from hospice care and understanding its broader role. Interestingly, students' knowledge did not significantly improve as they advanced through medical school, suggesting potential shortcomings in the curriculum. The findings highlight the need for more precise education and targeted training to better equip future healthcare providers for delivering patient-centered care.

Keywords Knowledge, Awareness, Palliative, Undergraduate, Medical, Students

Introduction

The World Health Organization (WHO) defines palliative care as 'an approach that improves the quality of life of patients and their families who are facing problems associated with life-threatening illness through the prevention and relief of suffering by means of early identification and impeccable assessment and treatment of pain and other problems, physical, psychosocial and spiritual.". Additionally, this strategy includes the patient's family members both throughout their life and after they pass away [1].

Looking ahead, The Lancet Global Health, by 2060, approximately 48 million people, or 47% of all global deaths, are projected to die while experiencing serious health-related suffering, marking an 87% increase from 26 million in 2016. Notably, 83% of these deaths will occur in low- and middle-income countries. Although serious health-related suffering is projected to rise globally, the most significant increase is expected in low-income countries, with a 155% growth between 2016 and 2060 [2]. In light of these trends, the International

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Observatory on End-of-Life Care (IOELC) has highlighted the "least favorable ratio" of patients served by palliative care facilities in Pakistan, where only one service was available for a population of 157,935,000. This stark statistic underscores the urgent need for more trained professionals in the field of palliative care [3].

Though there are no studies specifically assessing the need for palliative care in Pakistan, it is well established that non-communicable diseases, cancers, and the associated mortality rates are on the rise in the country [4] Without expanded integration of palliative care into cancer programs, many patients will suffer unnecessarily, putting both individuals and an already strained healthcare system at risk. To address this growing challenge, it is imperative to systematically introduce palliative care concepts into the medical school curriculum, equipping future physicians with the necessary skills to establish a robust system capable of delivering effective palliative care across Pakistan. Developing an understanding of the attitudes and knowledge needed to deliver such care is crucial [5, 6].

In terms of research on palliative care in Pakistan, a few studies exist. For example, Abbas et al. conducted a survey assessing Pakistani doctors' awareness of palliative care and concluded that many physicians lacked training in this area. The survey revealed a significant demand for more training, especially in pain management, communication skills, and end-of-life care. However, this study was conducted in 2004, and no updated literature is available [7].

Further supporting the need for broader research, a single-center study conducted by Daud et al. in 2014 at Lahore Medical & Dental College (LMDC) found that only 23% of participants reported having "quite a bit of knowledge" about palliative care, while just 5% felt they had "very high knowledge." About 43% of respondents indicated that end-of-life care was inadequately discussed in the community, although 44% believed the topic was sufficiently covered in public discourse. Significantly, 95% agreed on the need to raise awareness about end-of-life care. The most common source of knowledge about palliative care among participants was personal experience, often involving relatives or friends receiving such care [8].However, because this study was limited to a single institution, it is difficult to generalize the findings to the entire population of undergraduate medical students in Pakistan. Furthermore, the absence of a standardized tool to measure knowledge may reduce the overall reliability of the study's results, highlighting the need for more methodologically sound research [9].

Palliative care remains a relatively unfamiliar concept to the general population in Pakistan. The public is largely unaware of the nature of medical care available, and this is exacerbated by limited budgetary and resource allocations to healthcare. While palliative care is not currently a priority within the Pakistani healthcare system, a few private sector hospitals offer such services, including Shaukat Khanum Memorial Cancer Hospital, Aga Khan University Hospital (AKUH), Children's Cancer Hospital in Karachi, and several Christian hospices. However, none of these institutions have dedicated facilities for palliative care, apart from AKUH's homecare services [3] Studies have shown that demographic factors such as gender, education, and income, along with interpersonal relationship quality, influence awareness and attitudes toward palliative care. Women and lower-income individuals are generally more aware, while women and the more educated hold more favorable attitudes [9]. These findings suggest the need for targeted educational initiatives to improve awareness and acceptance of palliative care.

To bring about meaningful improvements, it is essential to first assess the level of knowledge among undergraduate medical students across Pakistan. Identifying gaps in the existing educational infrastructure is key to making impactful changes in the curriculum. Currently, no multicenter studies have been conducted in Pakistan to evaluate students' knowledge and awareness of palliative care, making it an important area for further research, from both individual and public health perspectives. There is a notable lack of data from lower-middle-income countries like Pakistan, and our study aims to fill this gap [10].

Methodology

Study design, setting and sample size

This was a descriptive cross-sectional study that assessed knowledge and awareness regarding palliative care among undergraduate medical students across Pakistan. The study included participants who were recruited from among all undergraduate medical students enrolled at the time the study was conducted. It was ensured that the form was shared in each province's medical university social media groups to obtain a viewpoint from each province.

The data were collected through an online form that was distributed by volunteers through university social media groups and official platforms across different medical schools in major cities in Pakistan (Karachi, Lahore, Peshawar, Quetta). The questionnaire was distributed by volunteers across various universities, who used university social media groups and official platforms to collect responses. Eligible participants for this study were undergraduate medical students over 18 years enrolled in a Bachelor of Medicine, Bachelor of Surgery (MBBS) program and who were willing to provide informed consent. The exclusion criteria included those who declined participation, were enrolled in non-MBBS undergraduate programs, or had already graduated from medical school.

The study was exempted from ethical approval from the Ethical Review Committee (IEC number:2023–8733-24,964). The data collection, data analysis, and manuscript writing process were completed in 4 months. The minimum sample size was calculated considering a confidence level of 95%, expected prevalence of 80%, and precision of 0.05 and was found to be 245.

Data collection and tools

1). The data collection technique for the study was an online self-report questionnaire on Google Forms, which participants were required to complete online to ensure the accuracy of the results. The data collected through the Google Form were entered into and stored on Google Drive, which was password protected and accessible only to the research team. Data was collected over 3 months. After the study was completed, the personal information (names and contact information) of all the participants was removed. The questionnaires all had a unique study ID assigned to them after the study was over. The completed questionnaires will be stored for a period of seven years in accordance with the intended Aga Khan University's storage policy, with access granted only to the research team to ensure participant confidentiality.

Variables measured

This questionarie collected data regarding the participant's demographic characteristics and four variables were used to collect data regarding the participants prior experience with palliative care ('Before completing this survey had you heard of palliative care', 'Have you, or anyone close to you, such as a friend or family member, required or had access to palliative care', 'Have you cared for someone at the end of life', and 'Would you ever consider taking up palliative care as a profession'). The knowledge of the participants was collected through the Palliative Care Knowledge Scale (PaCK), a validated instrument for assessing basic knowledge about palliative care [11]. The PaCKS is a knowledge questionnaire that consists of 13 true/false statements regarding the timing, population and care delivery of palliative care. Each correct answer was given the score "1", and incorrect responses were scored as "0." The third option, "I do not know," was included to avoid guessing and was considered and merged with incorrect responses and scored "0."Click or tap here to enter text. The PaCKS items were divided into two groups: general conceptions about palliative care (items no. 1, 2, 3, 9, 10, 12, 13) and common misconceptions about palliative care (items no. 4, 5, 6, 7, 8, 11). Permission to use the tool was obtained from Elissa Kozlov via email. The score was cumulated with a maximum score of 13 and the lowest being 0. A score represented a higher number of questions answered correctly and a better understanding of palliative care.

Statistical analysis

The PaCKS knowledge score was calculated using Microsoft Excel 2010 and entered into SPSS version 22.0; editing and logical checking were performed, and the data were analyzed. A descriptive analysis (frequency, percentage, mean and standard deviation) for categorical and quantitative variables was conducted. Following this, the distribution of these scores was assessed for normality. Appropriate statistical tests, either parametric or nonparametric, were employed following these evaluations. Bivariate analyses were conducted using independent-Samples T-test to investigate relationship between PaCKS score and a two independent level qualitative variable and one-way ANOVA to investigate relationship between PaCKS score and a qualitative variable with more than two independent levels Variables used to collect data regarding participants prior experience with palliative care were analyzed against the remaining five variables using the chi-square test for independence.

Results

Particpant characteristics

In total, 246 participants completed the survey. The majority of the respondents were female ($n=161$, 65.4%) and medical students from private medical schools ($n=158$, 64.2%). The survey included medical students from all four provinces of Pakistan, with the highest proportion of respondents coming from Sindh (73.6%), followed by Punjab (17.9%), KPK (5.3%), and Balochistan (3.3%). The sample was fairly well-distributed across different socioeconomic classes, with the majority (25.2%) belonging to households with a mean monthly family income of over 500,000 PKRs. Overall, 56.9% of the participants were third- and fourth-year medical students (Table 1).

What do participants know about palliative care?

The highest possible score on the PaCKS scale was 13, and our sample mean was 9.699, with a standard deviation of 2.76.

The proportion of incorrect answers varied between 3.7% (S9) and 17.5% (S5). Statement 5 also had the highest proportion (31.3%) of people answering "I don't know." Statement 5, which stated that palliative care is exclusively for people in the last six months of their life, was perhaps the least understood, with almost half of the respondents answering incorrectly or being unsure about

Table 1 Demographics and Palliative Care Experience of Participants

Variables	N (%) (N-total = 246)
Gender	
Female	161 (65.4)
Male	85 (34.6)
Institution of study	
Private	158 (64.2)
Public	88 (35.8)
Province (of institution)	
Sindh	181 (73.6)
Punjab	44 (17.9)
Khyber Pakhtun Khwa (KPK)	13 (5.3)
Balochistan	8 (3.3)
Mean monthly family income (Pakistani Rupees (PKR))	
< 50,000 PKR	16 (6.5)
50,000–100,000 PKR	40 (16.3)
100,000–200,000 PKR	57 (23.2)
200,000–300,000 PKR	32 (13)
300,000–400,000 PKR	18 (7.3)
400,000–500,000 PKR	21 (8.5)
> 500,000 PKR	62 (25.2)
Year of study	
1st year	36 (14.6)
2nd year	27 (10.9)
3rd year	64 (26.0)
4th year	76 (30.9)
5th year	43 (17.5)
Before completing this survey had you heard of palliative care?	
Yes	183 (74.4)
No	63 (25.6)
Have you, or anyone close to you, such as a friend or family member, required or had access to palliative care?	
Yes	91 (37.0)
No	155 (63.0)
Have you cared for someone at the end of life?	
Yes	97 (39.4)
No	149 (60.6)
Would you ever consider taking up palliative care as a profession?	
Yes	35 (14.2)
Maybe	111 (45.1)
No	100 (40.7)

it. A good majority of respondents (85%) correctly identified the goal of palliative care as improving a person's ability to participate in daily activities (S12). Approximately 82.5% and 80.9% of the respondents correctly understood that palliative care is a team-based approach to patient care and that it helps the whole family cope with a serious illness, respectively (Table 2).

The mean PaCKS score did not significantly differ by sex, institution of study, province of the institution, mean monthly family income, or year of study. The respondents who had heard of palliative care prior to completing the survey had a significantly greater mean PaCKS score than did those who had not (10.17 vs. 8.39, $p < 0.001$). No other association was found between the PaCKS score and the rest of our questions assessing participants' familiarity with palliative care (Table 3).

Table 2 Palliative Care Knowledge Score (PaCKS) responses

PaCKs Questionnaire (%) (*n* = 246)			
Question (Correct answer True(T)/ False (F))	**Correct**	**Incorrect**	**Don't know**
One goal of palliative care is to address any psychological issues brought up by serious illness (**T**)	**192 (78.0)**	13.0 (5.3)	41 (16.7)
Stress from serious illness can be addressed by palliative care (T)	**197 (80.1)**	10 (4.1)	39 (15.9)
Palliative care can help people manage the side effects of their medical treatments (T)	**43 (76.0)**	126 (8.9)	77 (15.0)
When people receive palliative care, they must give up their other doctors (F)	**191 (77.6)**	20 (8.1)	35 (14.2)
Palliative care is exclusively for people who are in the last six months of life (F)	**126 (51.2)**	43 (17.5)	77 (31.3)
Palliative care is specifically for people with cancer (F)	**180 (73.2)**	39 (15.9)	27 (11.0)
People must be in the hospital to receive palliative care (F)	**178 (72.4)**	31 (12.6)	37 (15.0)
Palliative care is designed specifically for older adults (F)	**189 (76.8)**	32 (13.0)	25 (10.2)
Palliative care is a team-based approach to care (T)	**203 (82.5)**	9 (3.7)	34 (13.8)
One goal of palliative care is to help people better understand their treatment options (T)	**169 (68.7)**	18 (7.3)	59 (24.0)
Palliative care encourages people to stop treatments aimed at curing their illness (F)	**171 (69.5)**	35 (14.2)	40 (16.3)
One goal of palliative care is to improve a person's ability to participate in daily activities (T)	**209 (85.0)**	14 (5.7)	23 (9.3)
Palliative care helps the whole family cope with a serious illness (T)	**199 (80.9)**	13 (5.3)	34 (13.8)

Familiarity with and experience with palliative care

Approximately three-quarters of the sample population responded that they had heard of the term 'palliative care', but only 37% of them reported that someone from their family or circle of friends had required access to palliative care at some point in their life. Approximately 40% of our respondents had cared for someone at the end of life. Only 14.2% of the respondents wanted to pursue palliative care as their profession, 40.7% did not want to take up a career in palliative care, and the remaining 45.1% were unsure about their decision (Table 1).

A statistically greater proportion of students from private institutions had heard of palliative care before completing our survey than did students from public institutions (83.5% vs. 58%, $\chi 2 = 19.427$, $p < 0.001$). We found that a significantly higher percentage of respondents had heard of palliative care as the mean monthly family income increased ($\chi 2 = 29.890$, $p < 0.001$). Seniority in medical school, determined by the year of study, was also linked to greater familiarity with palliative care ($\chi 2 = 18.960$, $p < 0.001$) (Table 4).

When asked whether they had cared for someone at the end of life, a significantly lower percentage of female respondents answered 'yes' compared to male respondents (34.2% vs. 49.4%), $\chi 2 = 5.417$, $p = 0.020$. A statistically greater proportion of participants with a lower mean monthly family income considered palliative care to be their profession. There was a strong association between mean monthly family income and the likelihood of considering palliative care profession, $\chi 2 = 12.631$, $p = 0.049$ (Table 5).

Discussion

Our study aimed to determine the depth of knowledge and awareness of medical students across Pakistan concerning palliative care. Our study reveals a predominance of female respondents, suggesting potential gender-based variations in interest levels toward this critical healthcare facet with 65% of the respondents being females, versus only 34.6% being males. These statistics are consistent with previous studies, which have shown similar trends in interests varying among both (genders [12–14], This may limit the ability to accurately compare knowledge levels and other factors between males and females. This imbalance could affect the generalizability of the results across both genders Our primary investigators were primarily basedin Karachi, located in the province of Sindh, and might have naturally attracted substantial attention from this region. However, it is important for us to acknowledge the inherent limitations of this regional focus, as the disproportionately high response rate from Sindh may not faithfully represent the awareness levels of medical students from other provinces, particularly Balochistan and the KPK. Punjab, the region with the highest proportion of medical students nationwide (MDCAT 2021 Data Analysis Report), provided a mere 17.9% of the responses. Furthermore, the markedly lower response rates from these regions, at 3.3% and 5.3%, respectively, underscore the imperative for more comprehensive, geographically inclusive research projects to capture a holistic understanding of Palliative Care awareness nationwide.

An intriguing demographic trend emerges from our data, with the majority of respondents consisting of

Table 3 Palliative Care Knowledge Score (PaCKS) across variables

Variables	PaCKs Score (Mean ± (SD))	*P*- value
Female	9.91 ± 2.51	0.145
Male	9.36 ± 3.19	
Institution of study		
Private	9.91 ± 2.99	0.146
Public	9.36 ± 2.30	
Province (of institution)		
Sindh	9.87 ± 2.69	0.561
Punjab	9.36 ± 2.95	
KPK	9.08 ± 3.40	
Balochistan	9.38 ± 2.77	
Mean monthly family income		
< 50,000 PKR	8.75 ± 3.36	0.458
50,000–100,000 PKR	9.45 ± 2.70	
100,000–200,000 PKR	9.58 ± 2.72	
200,000–300,000 PKR	9.59 ± 2.70	
300,000–400,000 PKR	10.28 ± 2.02	
400,000–500,000 PKR	10.57 ± 3.09	
> 500,000 PKR	9.89 ± 2.82	
Year of study		
1st year	9.06 ± 3.04	0.597
2nd year	9.64 ± 2.04	
3rd year	9.98 ± 2.42	
4th year	9.79 ± 2.78	
5th year	9.69 ± 3.35	
Before completing this survey had you heard of palliative care?		
Yes	10.17 ± 2.39	*< 0.001*
No	8.39 ± 3.32	
Have you, or anyone close to you, such as a friend or family member, required or had access to palliative care?		
Yes	10.0 ± 2.57	0.224
No	9.55 ± 2.88	
Have you cared for someone at the end of life?		
Yes	9.52 ± 2.80	0.352
No	9.85 ± 2.76	
Would you ever consider taking up palliative care as a profession?		
Yes	9.17 ± 3.59	0.328
Maybe	9.96 ± 2.48	
No	9.65 ± 2.75	

students from the third and fourth years of medical school. This phenomenon suggests a burgeoning interest in palliative care as students progress through their academic journey. However, despite this apparent trajectory of increased familiarity, our analysis reveals a consistency in the mean packs score across different academic years, as the level of knowledge of more senior students did not differ significantly from that of juniors, while previous research suggests that as students advance through higher grades, their knowledge scores tend to improve, indicating a positive trend [15, 16]. This signals a deeper examination of the educational approaches employed within medical curriculum nationwide. Are current instructional methodologies adequately equipping students with the requisite knowledge and skills to navigate the complexities of palliative care? Or does the static nature of knowledge acquisition as students advance through their studies hint at systemic inadequacies in curriculum design and implementation?

Table 4 Prior Familiarity regarding palliative care across demographic variables

Variables	Before completing this survey had you heard of palliative care? N (%) (*n* = 246)		Chi- Square values	*p*- value
	Yes	No		
Gender				
Female	119 (73.9%)	42 (26.1%)	0.056	0.813
Male	64 (75.2%)	21 (24.7%)		
Institution of study				
Private	132 (83.5%)	26 (16.5%)	19.427	*< 0.001*
Public	51 (58%)	37 (42%)		
Province (of institution)				
Sindh	141 (77.9%)	40 (22.1%)	5.727	0.126
Punjab	27 (61.4%)	17 (38.6%)		
KPK	10 (76.9%)	3 (23.1%)		
Balochistan	5 (62.5%)	3 (37.5%)		
Mean monthly family income				
< 50,000 PKR	7 (43.8%)	9 (56.3%)	29.890	*< 0.001*
50,000–100,000 PKR	28 (70.0%)	12 (30.0%)		
100,000–200,000 PKR	35 (61.4%)	22 (38.6%)		
200,000–300,000 PKR	21 (65.6%)	11 (34.4%)		
300,000–400,000 PKR	17 (94.4%)	1 (5.6%)		
400,000–500,000 PKR	20 (95.2%)	1 (4.8%)		
> 500,000 PKR	55 (88.7%)	7 (11.3%)		
Year of study				
1st year	18 (54.5%)	15 (45.5%)	18.960	*< 0.001*
2nd year	15 (60.0%)	10 (40.0%)		
3rd year	41 (69.5%)	18 (30.5%)		
4th year	55 (78.6%)	15 (21.4%)		
5th year	37 (94.9%)	2(5.1%)		

Table 5 Experience of caring for someone at the end of life among the sample

Variables	Have you cared for someone at the end of life? N (%) (*n* = 246)		Chi- Square values	*p*- value
	Yes	No		
Gender				
Female	55 (34.2%)	106 (65.8%)	5.417	*0.020*
Male	42 (49.4%)	43 (50.6%)		
Institution of study				
Private	65 (41.1%)	93 (58.9%)	0.540	0.463
Government	32 (36.4%)	56 (63.6%)		
Province (of institution)				
Sindh	73 (40.3%)	108 (59.7%)	4.575	0.206
Punjab	20 (45.5%)	24 (54.5%)		
KPK	2 (15.4%)	11 (84.6%)		
Balochistan	2 (25.0%)	6 (75.0%)		
Mean monthly family income				
< 50,000 PKR	10 (62.5%)	6 (37.5%)	6.638	0.356
50,000–100,000 PKR	18 (45.0%)	22 (55.0%)		
100,000–200,000 PKR	24 (42.1%)	33 (57.9%)		
200,000–300,000 PKR	12 (37.5%)	20 (62.5%)		
300,000–400,000 PKR	7 (38.9%)	11 (61.1%)		
400,000–500,000 PKR	7 (33.3%)	14 (66.7%)		
> 500,000 PKR	19 (30.6%)	43 (69.4%)		
Year of study				
1st year	14 (42.4%)	19 (57.6%)	1.577	0.813
2nd year	11 (44.0%)	14 (56.0%)		
3rd year	21 (35.6%)	38 (64.4%)		
4th year	32 (45.7%)	38 (54.3%)		
5th year	15 (38.5%)	24 (61.5%)		

Our study revealed a mean score of 9.699(SD = 2.76) for medical students in Pakistan, indicating a solid understanding of palliative care. Kozlov's community-based sample reported a mean score of 5.25 (SD = 4.77, range = 0–13), highlighting that Pakistani medical students outperform the general public in terms of palliative care knowledge. Furthermore, compared to a cross-sectional study by Mallon et al. among undergraduate students at a UK university, our findings show a higher mean score. Given that the PACKS is a recently developed tool, the only comparable score available is from the study by [14], which evaluated undergraduate students at a university in the UK. Among the various student groups, those enrolled in the faculty of life and health sciences department achieved a mean score of 9.5 with a standard deviation of 3.2, the highest among the three types of faculties studied. According to our study, Pakistani medical students still demonstrate a superior understanding of palliative care concepts.

Our study pinpointed prior awareness of palliative care prior to the questionnaire as the sole variable significantly impacting the mean packs score. Consequently, we delved into the factors influencing prior awareness of palliative care.

Institutional affiliation emerged as a notable determinant, with students from private institutes reporting higher levels of prior awareness of the topic. Similarly, a positive correlation was observed between monthly family income and prior awareness of palliative care [17, 18].

While these associated levels of literacy and access to resources might play a role in producing such results, these correlations remain speculated and would require further research to be backed up by evidence.

Interestingly, when queried about prior experience in caring for a person at the end of life, a greater proportion of male respondents answered affirmatively [17]. These results align with those of prior studies indicating a high incidence of similar experiences among males [18]. This trend could be indicative of a growing male inclination toward healthcare professions and could also be reflective of common practices in Pakistan, where a greater sense of responsibility is bestowed upon men in household matters, particularly those of a more serious nature, where they often assume decision-making roles [19]. In future research projects, this aspect could further be explored by inquiring about the nature of tasks that were assigned to them.

It is difficult to establish the reason for this, perhaps future research can be aimed at determining the impact of socioeconomic factors upon the choice of career in undergraduate medical students.

Upon scrutinizing the responses from students to our questionnaire, we directed our attention toward examining three specific items: items 5, 10, and 11.Item 5 sought to gauge students' understanding of the notion that "Palliative care is only for people in their last six months of life." While most respondents answered correctly, a notable portion (31.3%) admitted uncertainty by selecting "I do not know," and a significant fraction (17.5%) provided incorrect responses. This observation suggests a lack of clarity among students regarding the scope of palliative care, with many possibly assuming that palliative care is only applicable in the final stages of life. Moving on to item 11, which inquired whether "Palliative care means stopping treatments aimed at curing the illness," approximately 70% of respondents answered correctly. However, the remaining participants were divided between selecting "I do not know" and incorrectly affirming the statement as "true." Notably, both items 5 and 11 touch upon criteria commonly associated with hospice care. The fact that a considerable number of students struggled with these questions implies a degree of confusion between palliative and hospice care, possibly stemming from the interchangeable use of these terms despite their distinct purposes and practices.

Turning our attention to item 10, which posited that "Palliative Care helps people understand their treatment options better," it is notable that a quarter of respondents expressed uncertainty about this statement. This uncertainty may stem from the misconception that palliative care is exclusively reserved for end-of-life scenarios, where treatment options may be perceived as limited. This lack of clarity may also contribute to the observed difficulties in correctly answering item 11. Kozlov's study [17], though focused on community-dwelling adults rather than students, revealed similar patterns in awareness and knowledge about palliative care. In her research, items 5, 10, and 11 also had a significant number of incorrect responses. However, her study showed a much greater percentage of "don't know" individuals than did our study. This suggests that while many of our respondents were uncertain about the correct answers, they were still more aware of and had a better understanding of the differences between palliative care and hospice. This is particularly notable compared to a community-based sample of educated adults in a developed country.

In light of these findings, it becomes evident that there is a need for greater clarity and understanding regarding the nuances of palliative care among medical students. Addressing this knowledge gap could be achieved through comprehensive education that encompasses both palliative and hospice care topics, elucidating the appropriate contexts for each type of care.

A comprehensive curriculum should focus on key aspects of palliative care to promote holistic and compassionate patient management. The 'Principles for Including Palliative Care in Undergraduate Curricula,' developed by Palliative Care Curriculum for Undergraduates Project Team at Queensland University of Technology, Australia, can serve as a valuable framework for designing undergraduate palliative care education. Their approach can be adapted to fit local cultural contexts, drawing on the core values of palliative care:

- Dignity of the patient, caregiver(s), and family
- Empowerment of the patient, caregiver(s), and family
- Compassion toward the patient, caregiver(s), and family
- Equity in access to palliative care services and resource allocation
- Respect for the patient, caregiver(s), and family
- Advocacy for the expressed wishes of patients, families, and communities
- Excellence in the provision of care and support
- Accountability to patients, caregivers, families, and the community

Additionally, the framework outlines clear benchmarks for incorporating palliative care into undergraduate curricula and specifies the key competencies that graduating students should attain. This includes a deep understanding of patient-centered care, effective communication with patients and their families, and a commitment to upholding the ethical principles of palliative care [20].

Strengths

This study represents a pioneering effort in Pakistan and is the first of its kind to explore palliative care awareness among undergraduate medical students. Unlike the previous literature limited to healthcare workers, our study casts a wider net, gathering responses from across Pakistan rather than from a few select institutes. In contrast to existing studies focusing on undergraduate medical students of a single institute, ours encompasses a broader demographic, providing a more representative snapshot of the country's medical student population. Moreover, given the dearth of recent literature on this topic in Pakistan, our study fills a critical gap by offering an updated perspective on palliative care awareness among students. A recent scoping literature review by Patel et al. highlights the urgent need for more studies on knowledge, attitudes, and practices (KAPs) related to palliative care in developing countries. This review highlights a significant gap in the literature from these regions, highlighting the necessity for more comprehensive research to understand and improve palliative care awareness and practices in developing nations [10]. Hence, our study contributes to addressing this gap by providing valuable insights and data from a developing country context, thereby adding to the limited but growing body of research in this area. Additionally, our utilization of the Packs questionnaire, a validated tool for assessing knowledge of palliative care, adds robustness to our findings. Its proven efficacy in accurately gauging knowledge levels, coupled with our study's demonstration of construct validity and potential for educational interventions, underscores its utility in both research and practice.

The cross-sectional design of our study offers several advantages in this context, allowing us to quickly gather a broad range of data from students across multiple institutions hence providing a snapshot of current palliative care awareness. The approach here is also particularly useful in identifying gaps in knowledge which could aid in forming educational strategies.

Limitations

Given that the research team was primarily based in Karachi, a considerable proportion of responses were obtained from the province of Sindh. This geographical concentration represents a limitation, as it may introduce bias and limit the generalizability of our findings to the broader population of medical students across Pakistan. Future studies should aim to address this limitation by ensuring a more geographically diverse sample, thereby enhancing the representativeness and validity of the data. Additionally, since the study was conducted using an online questionnaire, individuals who are less active on certain social media platforms may not have received the form, thus limiting their ability to participate in the study. Since the study is cross-sectional, the findings reflect only a specific point in time. Future research should focus on monitoring changes in the knowledge and attitudes of undergraduate medical students in Pakistan over time.

Conclusion

This research highlights the current understanding of palliative care among medical students in Pakistan. The study shows that while many students have a general grasp of palliative care concepts, there are still significant areas of confusion, particularly in distinguishing it from hospice care and recognizing its broader applications.

The only direct correlation we found with a higher PaCKS score was prior awareness of palliative care. Factors contributing to this prior awareness included coming from a higher-income background, being in a more senior year of medical school, and attending a private institution compared to a public one. However, none of these factors were significantly associated with a higher level of knowledge, as evidenced by the lack of a strong correlation with an elevated PaCKS score.

The misunderstanding between palliative and hospice care, along with uncertainty about palliative care's role in patient decision-making, underscores the need for more precise and thorough education on these topics. Enhancing the curriculum and providing targeted training could better prepare students to offer comprehensive, patient-centered care.

By introducing palliative care concepts early in medical education and fostering collaboration with experienced professionals in the field, future healthcare providers can be better equipped to meet global standards and improve patient outcomes in Pakistan.

Supplementary Information

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Supplementary Material 1.

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Authors' contributions

Z.B. drafted the protocol, compiled the questionnaire, and wrote the introduction and discussion sections, providing a comprehensive context and thorough analysis of the findings. M.J.A.M. drafted the protocol, compiled the questionnaire, carried out the statistical analysis, ensuring accurate interpretation and presentation of the data. He also compiled all tables and supplementary information, supporting the study's conclusions and providing detailed insights. He also wrote the methodology section of the manuscript. V.V. played a crucial role in the dissemination of the questionnaire, ensuring a wide and

diverse response rate. V.V. also wrote the results section, clearly presenting the data and highlighting key findings. A.K. disseminated the questionnaire alongside V.V., and wrote the methods section, detailing the study's design and procedures. A.K. also did the final formatting of the paper, ensuring consistency and adherence to publication standards. M.A.W., as the senior author, supervised the entire project. A.W. provided critical oversight, guided the research direction, and ensured the study met the highest standards of scientific rigor.

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Data availability

Only the research team had access to a password-protected Excel document with the data, which can be shared upon requesting the corresponding author at zoha.bilal@scholar.aku.edu.

Declarations

Ethics approval and consent to participate

Our study was submitted to the Ethics Review Committee at the Aga Khan University for an exemption and was approved.
All participants were asked for informed consent before filling out the questionnaire.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

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References

1. Wajid M, Rajkumar E, Romate J, George AJ, Lakshmi R, Simha S. Why is hospice care important? An exploration of its benefits for patients with terminal cancer. BMC Palliat Care. 2021;20(1):1–8.
2. Sleeman KE, de Brito M, Etkind SM, Nkhoma K, Guo P, Higginson IJ, et al. The escalating global burden of serious health-related suffering: projections to 2060 by world regions, age groups, and health conditions. Lancet Glob Health. 2019;7:e883–92 Available from: https://www.thelancet.com/lancetgh. Cited 2024 Sep 26. .
3. Khan RI. Palliative care in Pakistan. Indian J Med Ethics. 2017;2(1):37–42.
4. Trif M, Chira A, Suharoschi R, Ali A, Faisal Manzoor M, Ahmad N, et al. The Burden of Cancer, Government Strategic Policies, and Challenges in Pakistan: A Comprehensive Review. Front Nutr. 2022;1:940514. Available from: https://www.frontiersin.org
5. Biswas J, Banik PC, Ahmad N. Physicians' knowledge about palliative care in Bangladesh: A cross-sectional study using digital social media platforms. PLoS One. 2021;16(9 September):1–10 Available from: https://doi.org/10.1371/journal.pone.0256927 .
6. Pieters J, Dolmans DHJM, Verstegen DML, Warmenhoven FC, Courtens AM, Everdingen MHJVDB van. S12904–019–0458-X.Pdf. 2019;1–7.
7. Abbas SQ, Muhammad SR, Mubeen SM, Abbas SZ. Awareness of palliative medicine among Pakistani doctors: A survey. J Pak Med Assoc. 2004;54(4):195–9.
8. Daud S, Anjum A, Bhatti BK. Perceptions of medical students about end of life palliative care. Pakistan Journal of Medical and Health Sciences. 2012;6(4):812–6.
9. Lu X, Liu J. Factors Influencing Public Awareness of and Attitudes Toward Palliative Care: A Cross-Sectional Analysis of the 2018 HINTS Data. Front Public Health. 2022;7:10.
10. Patel P, Lyons L. Examining the Knowledge, Awareness, and Perceptions of Palliative Care in the General Public Over Time: A Scoping Literature Review. Am J Hosp Palliat Med. 2020;37(6):481–7.
11. Kozlov E, Carpenter BD, Rodebaugh TL. Development and validation of the Palliative Care Knowledge Scale (PaCKS). Palliat Support Care. 2017;15(5):524–34.
12. Mcilfatrick S, Hasson F, Mclaughlin D, Johnston G, Roulston A, Rutherford L, et al. Public awareness and attitudes toward palliative care in Northern Ireland. 2013.
13. Tripken JL, Elrod CS. Young Adults' Perspectives on Advance Care Planning. Am J Hosp Palliat Med. 2018;35(4):627–34.
14. Mallon A, Slater P, Hasson F, Casson K, McIlfatrick S. What do young adults know about palliative care? A cross-sectional survey Public Health. 2021;1(191):78–84.
15. Jiang Q, Lu Y, Ying Y, Zhao H. Attitudes and knowledge of undergraduate nursing students about palliative care: An analysis of influencing factors. Nurse Educ Today. 2019;1(80):15–21.
16. Dimoula M, Kotronoulas G, Katsaragakis S, Christou M, Sgourou S, Patiraki E. Undergraduate nursing students' knowledge about palliative care and attitudes towards end-of-life care: A three-cohort, cross-sectional survey. Nurse Educ Today. 2019;1(74):7–14.
17. Kozlov E, Mcdarby M, Reid MC, Carpenter BD. Knowledge of Palliative Care Among Community-Dwelling Adults. 2018;35(4):647–51.
18. Burns CM, Leblanc TW, Abernethy A, Currow D. Young caregivers in the end-of-life setting: A population-based profile of an emerging group. J Palliat Med. 2010;13(10):1225–35.
19. Javed R, Mughal M. Have a Son, Gain a Voice: Son Preference and Female Participation in Household Decision Making. J Dev Stud. 2019;55(12):2526–48.
20. Palliative Care Curriculum for Undergraduates (PCC4U) Project Team. Principles for including palliative care in undergraduate curricula. Brisbane: QUT; 2012.

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