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Assessment of palliative care knowledge among medical students and factors affecting it: A cross-sectional study, 2021

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ABSTRACT

Background: In Saudi Arabia the number of palliative care PC experts is relatively low, so most PC work is done by doctors who have recently graduated. Moreover, PC is not a mandatory course in medical school but can be taken as an elective. *Method:* This cross-sectional, web-based survey used a modified questionnaire to measure self-reported PC knowledge. A total of 266 medical students at Umm Alqura University (males: 160, 60.2%) participated. Of the participants, 166 (62.4%) were sixth-year students, 86 (32.3%) were in their internship year, and 14 (5.3%) were one-year post-graduate physicians. *Result:* Most of the participants (124, 46.6%) reported a self-assessed poor level of PC knowledge. However, interest in the oncology specialty as future career or attending an educational course about PC affected students' knowledge. *Conclusions:* Half of the undergraduate medical students expressed an interest in learning about PC which can be part of the curriculum.

Keywords: palliative care, knowledge, undergraduate medical students

1. INTRODUCTION

Palliative care (PC) is a relatively new medical specialty that has been recognized since 1987 in the United Kingdom (Brooksbank, 2009; Saunders, 2001). According to the Worldwide PC Alliance (WPCA) and the World Health Organization (WHO), PC is an integrated multidisciplinary specialty aimed at promoting the quality of life for adult and pediatric patients suffering from a life-threatening illness. PC promotes living through symptom-control and reduction of suffering associated with pain and improving other life aspects including body corporeal, mental health, and community interactions for patients and family members, regardless of the patient's diagnosis (Gwyther & Krakauer, 2011; Sepúlveda et al., 2002). Globally, three of the five continents have good quality PC centers (World Palliative Care Alliance, 2014). In Saudi Arabia (SA), the first PC services were

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established in 1992 at the King Faisal Specialist Hospital and Research Centre, Riyadh (Alshammary et al., 2014; Nixon, 2004).

Internationally, 19 million adults need end-of-life care. The increase in cancer incidence is expected to progress from 2008 to 2030 by 81% to 100% in low and middle developing countries, respectively. By 2030, cancer cases in SA are expected to increase 8–10 times among females and males (Alshammary et al., 2014; Fidler et al., 2018; Nixon, 2004; World Palliative Care Alliance, 2014). Moreover, noncancerous illnesses, like sickle cell disease, peripheral arterial disease, and advanced liver and kidney diseases, are on the increase, which makes the need for PC much higher (Ghanem et al., 2011).

Previous studies on medical students in Turkey and Germany found that there was a lack of knowledge about PC among medical students (Eyigor, 2013; Weber et al., 2011). In contrast to previous results, previous study in Netherlands on final-year medical students showed that nearly half of the students had correct answers about PC knowledge but did not feel confident in providing PC (Pieters, 2019). Similarly, a study on nurses in PC showed an overall poor level of medical knowledge but greater knowledge in aspects of psychiatric and PC philosophy (Prem et al., 2012). In SA, three studies were done on residents to assess PC knowledge. According to a recent study on several medical specialties, oncologists scored the highest on attitude, behavior, and knowledge, while family physicians had the relatively lowest score. The other two studies were in Saudi Arabian hospital on Eastern Province and King Abdelaziz University on western region. Both showed low levels of understanding regarding PC among residents (Alamri, 2012; Al-Drees et al., 2019; Malibari et al., 2011). Another study done in Riyadh on nursing students (most of them in their final year), too showed that the students had less knowledge on PC (Khraisat, 2017). In addition, a Jordan-based study on nurses reported insufficient knowledge as well (Al Qadire, 2014).

Despite the overall low level of PC knowledge among physicians, as previously stated, junior physicians are the ones who mostly look after patients who need PC due to a shortage of specialists (Wilkes, 1982; Lloyd-Williams & MacLeod, 2004). One of the reported factors that impacts their knowledge is insufficient theoretical and practical exposure during undergraduate studies in medical school (Eyigor, 2013; Gibbins et al., 2011). To the best of our search, no research has investigated the undergraduate medical students' level of knowledge on PC in SA. Therefore, we aim to evaluate the PC knowledge of the recently graduate and undergraduate students of bachelor's degree in medicine and surgery (MBBS) at Umm Al-Qura University (UQU).

2. MATERIALS AND METHODS

Study Type and Population

This study conducted to scout the knowledge level about PC among the students at the college of medicine, UQU. The methodology was descriptive and cross-sectional survey. It included undergraduate sixth-year medical students, 7th year which is the clerkship year students in (MBBS), and one-year post-graduate doctor who work as general practitioners but are not enrolled in postgraduate programs. Both students and interns have been introduced to the PC elective course during the program. This population was selected to assess PC accumulated knowledge through the program that lack mandatory PC courses in undergraduate schools.

Study Tool

A web-based modified valid 20-item PC knowledge questionnaire was adopted and used (Nakazawa et al., 2007). This tool showed consistency, effectiveness, and usefulness (Eyigor, 2013; Lopez-Garcia et al., 2020). The survey had three sections. The first section was about the participants' sociodemographic data: gender, academic level, and grade point average (GPA). The second section was about students' perceptions toward PC education and any PC-related education or training within the program, internship, or extra-curriculum. The third section included the 20 items of the PC Knowledge Test (PCKT). Each item consisted of a statement with a true or false answer, and each correct answer was counted as one mark. A score of 70% determined the cut point for a good level of PC knowledge, while any score of less than 70% was labeled as low PC knowledge. The study was approved ethically from the UQU IRB committee (IRB #: HAPO-02K-012-2021—06-690). Written consent was also obtained from the respondents before enrollment with ensuring about confidentiality of the answers.

Data Handling and Statistical Calculation

Data were collected over the duration of two months from Jul to Aug 2021 through an electronic self-administrated survey made through Google Forms. It was then exported to a Microsoft Excel sheet for cleaning and codding. For data analysis, IBM SPSS version 25 was used by using different tests, including frequencies, central tendency, one-way ANOVA, and independent sample t-test according to the type of variables. To compare students with a good level of PC knowledge and students with a poor level of PC knowledge chi-square test was used. A p-value of less than 0.05 was considered statistically significant in the calculations.

3. RESULTS

The total population included 757 students. The sample size was calculated based on a ninety five percent confidence interval. With the margin error of 5%, the sample size was 290, while the response rate was 89%, (266 people). Result showed males were half of the participants 160 (60.2%), the mean age was found to be 23.46±0.833 years and a mean GPA of 3.51±.3. Most of the respondents, that is, 166 students (62.4%) were in sixth-year medical college, followed by 86 students (32.3%) in internship year, and lastly, 14 physicians (5.3%). Regarding self-assessment of PC, 124 respondents (46.6%) evaluated their knowledge as poor, 119 students (44.7%) evaluated their knowledge as borderline, and 20 students (7.5%) evaluated themselves as having good knowledge. Only three (1.1%) reported having excellent knowledge. Most respondents had below average knowledge regarding PC (200 respondents, 75.2%) (Table 1, Figure 1).

Table 1 Demographic data of the participants (n=266)

Variable	N = 266 N (%)	
Age	Mean ±SD (23.46±.833)	
GPA	Mean ±SD (3.51±.3)	
Gender	Male	160 (60.2)
	Female	106 (39.8)
Participants' rank	Senior students	166 (62.4)
	Interns	86 (32.3)
	Physicians	14 (5.3)
Participants' self-rating of PC knowledge	Excellent	3 (1.1)
	Good	20 (7.5)
	Borderline	119 (44.7)
	Poor	124 (46.6)

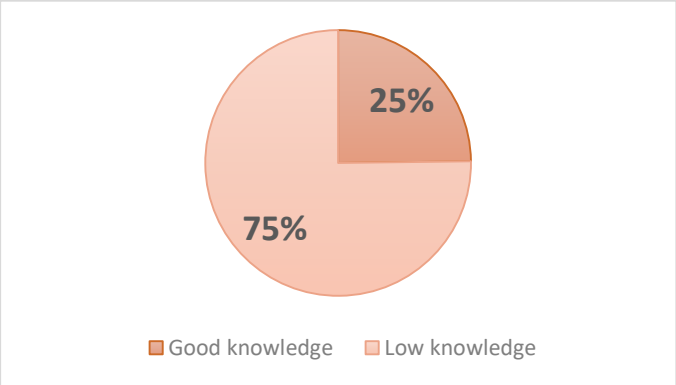

Figure 1 Score of PCKT among students

In the PC-specific knowledge questions (Table 2), the respondents had a high number of proper answers in the "philosophy" domain. The first question, whether "PC should be provided only to those lacking curative treatments", was answered as false by 152 respondents (57.1%). For the second question, "PC should not be administered at the same time as anti-cancer treatments," the percentage of correct answers was even greater at 255 (84.6%). Most respondents considered that long-term opioids-administration can often induce addiction. Only 35 physicians (13.2%) correctly answered this question. Almost all respondents (253, 95.1%) had a fair idea that the objective of pain management is to improve the patients' welfare. Regarding the medication used in cancer patients, 115 respondents (43.2%) denied the use of pentazocine during mild pain, while 127 respondents (47.7%) agreed that non-steroidal anti-inflammatory drugs may be prescribed along with opioids. More than half responded 158 (59.4%), correctly agreed that its effect decreases when combined with pentazocine or buprenorphine hydrochloride, and 184 respondents (69.2%), agreed that it did not affect survival time.

Regarding the morphine use as an analgesic for respiratory discomfort experienced by PC patients, only 81 respondents (30.5%) answered it correctly. Similarly, 81 (30%) did not correlate oxygen saturation with dyspnea. Only 63 respondents (23.7%) correctly

denied that regular use of opioids may cause respiratory depression. A majority of respondents (180, 67.7%) agreed that anticholinergic drugs or scopolamine hydrobromide are effective in reducing lung secretions for terminally diseased patients.

Regarding the psychiatric problems domain, most respondents answered the first three questions correctly: 158 respondents (59.4%) agreed that drowsiness reduces patient discomfort in their final days of life, 152 respondents (57.1%) agreed that benzodiazepines can control patient delirium, and a wide number of respondents (211, 79.3%) agreed that giving dying patients continued sedation, relieves their pain. Only 99 respondents (37.2%) denied that delirium is caused by morphine in the cancer patients who terminally ill, and 105 respondents (39.5%) disagreed with the need to increase the calorie intake in comparison to early stages.

Half of the study respondents correctly responded to gastrointestinal problem domain questions. While 125 respondents (47%) agreed that we could use two additional routes to the central venous route, 142 respondents (53.4%) agreed that patients in progressed cancer can use steroids to improve their appetite. Additionally, more than half the respondents (154, 57.9%) disagreed with using intravenous infusion to help prevent mouth dryness in dying patients. Most respondents recognized the purpose of pain management (95.1%). Nearly a quarter of the population showed an acceptable knowledge in the philosophy aspect (70.85%), followed by pain (54.6%), psychiatric problems (54.5%), and gastrointestinal problems (52.7%) compared to insufficient knowledge in the dyspnea (38.1%) domain. Lastly, most of the respondents showed lesser understanding of opioid use in PC (13.2%).

Table 2. Student's knowledge of PC (n=266)

Domains	Correct answer N (%)
Philosophy	
1. PC should be offered only for those patients with no available curative treatment	152(57.1)
2. PC should not be given together with anti-cancer medications	255 (84.6)
Pain	
3. Goodnight's sleep is a one of the aims of pain management	253 (95.1)
4. With mild cancer pain, more frequent use of pentazocine is favoured over opioids	115 (43.2)
5. Regular use of opioids is a contraindication for the concomitant use of non-steroidal anti-inflammatory agents	127 (47.7)
6. When pentazocine or buprenorphine hydrochloride is used with opioids, the effect of the opioids should be reduced	158 (59.4)
7. Long-term opioids use can typically lead to addiction	35 (13.2)
8. Opioids use has no effect on survival time	184 (69.2)
Dyspnea	
9. In cancer patients, morphine should be administered to treat dyspnea	81 (30.5)
10. Respiratory depression is frequent in cases of regular use of opioids	63 (23.7)
11. Oxygen saturation levels and dyspnea are directly correlated	81 (30.5)
12. Anticholinergic medications or scopolamine hydrobromide can help lessening bronchial secretions in dying patients	180 (67.7)
Psychiatric problems	
13. Drowsiness caused by electrolyte imbalance should reduce patient discomfort in the final days of life	158 (59.4)
14. Controlling delirium with benzodiazepines should be possible	152 (57.1)
15. To relieve pain, some dying patients will require continual sedation	211 (79.3)
16. Delirium is a common adverse effect of morphine use in cancer patients who are terminally ill	99 (37.2)
17. In comparison to early stages of cancer, terminal phases require a larger calorie intake	105 (39.5)
Gastrointestinal problems	
18. For individuals who are incapable to continue a peripheral intravenous circulation, there are two options besides central venous rout.	125 (47)
19. Appetite could be improved in patients with progressive cancer using steroids	142 (53.4)
20. Dry mouth in dying patients could be relieved by intravenous infusion	154 (57.9)

Table 3 shows the comparison between respondents with good and poor PC knowledge. The result did not show any significant difference between the groups regarding gender and GPA (p = 0.247 and 0.872, respectively). However, respondents with good knowledge had significantly encountered some form of education on PC (p = 0.00), and they attended elective PC courses and a PC symposium which were not mandatory college courses (p = 0.00). The good knowledge group demonstrated significantly higher self-ratings of PC knowledge (p = 0.00) In addition, they showed more interest in becoming a PC specialist compared to the respondents who had low scores on PC comprehension (p = 0.002). However, respondents with poor knowledge demonstrated a higher need to gain more information about PC (p = 0.002) and interest to have a PC course to the undergraduate curriculum (p = 0.018).

Table 3: Comparison between participants with good and poor palliate care knowledge (n=266)

	Variable	Good Knowledge (N = 66)	Poor Knowledge (N = 200)	Total (N = 266)	P-value
Gender	Male	44	116	160	0.247
	Female	22	84	106	
GPA rating	>3.5	22	60	82	0.872
	3.49-2.5	31	100	131	
	<2.5	13	40	53	
Came across any education about PC	Yes	59	105	164	0.000*
	No	7	95	102	
Source of PC knowledge	In the formal curriculum	9	53	62	0.000*
	In elective course	28	7	35	
	Symposium outside the college	17	5	22	
	A family member is a PC provider	0	1	1	
	A family member who needs PC	3	1	4	
	Self-education	5	19	24	
	None	1	113	114	
	oncology club	3	1	4	
Self-rating of PC knowledge	Good Knowledge	30	18	48	0.000*
	Poor knowledge	36	180	216	
Interested to become PC specialist	yes	4	6	10	0.018*
	no	52	129	181	
Interested in learning more information about PC	yes	36	103	139	0.002*
	no	21	32	53	
Think it is very important to add education about PC to the undergrad curriculum	yes	52	126	178	0.018*
	no	14	74	88	

*Chi square test

A one-way ANOVA was performed to test the interelation between the average PCKT score and the selected future specialty (Table 4). A *p*-value of 0.015 was noticed as a significant difference. The top five specialties with the highest PCKT mean were

demonstrated in the following order: adult oncology (13.50), followed by forensic medicine (13), pediatric oncology (11.67), anesthesia (11.40), and general surgery (11.30). In contrast, the lowest PCKT mean scores were noticed in psychiatry and rehabilitation (6), psychiatry (8.73), pediatric neurology, and pathology (9), and lastly, orthopedic surgery (9.09).

Table 4. Medical specialties ranked in order of PCKT score

Specialty	Mean PCKT score	P-value
Adult Oncology	13.50	0.015
Forensic Medicine	13.00	
Pediatric oncology	11.67	
Anesthesia	11.40	
General Surgery (including its subspecialties)	11.30	
Diagnostic Radiology	11.20	
Pediatric Medicine (including its subspecialties)	11.18	
Neurology	11.17	
Preventive Medicine	11.00	
Dermatology	11.00	
Cardiac Surgery	11.00	
Family Medicine	10.63	
Internal Medicine (including its subspecialties)	10.47	
Neurosurgery	10.44	
Emergency Medicine	10.43	
Geriatric	10.00	
OB/GYN	9.89	
Otolaryngology	9.50	
Plastic & Reconstructive Surgery	9.50	
Ophthalmology	9.25	
Urology	9.20	
Orthopedic Surgery	9.09	
Pathology	9.00	
Pediatric Neurology	9.00	
Psychiatry	8.73	
Psychiatry & rehabilitation	6.00	

PCKT: palliative care knowledge test, *: Statistically significant.

4. DISCUSSION

In this study, the intention was reveal the magnitude of knowledge of PC among the freshly graduated doctors and undergraduate MBBS students at UQU, SA. Most respondents had low PC knowledge (200, 75.2%), while 66 respondents (24.8%) had good knowledge. The number of respondents in the questionnaire was 266. Almost 124 and 119 perceived their self-knowledge of PC as poor and borderline, respectively. In addition, only 19 respondents came across the PC course during medical school. This finding might reflect similar result of a study done on Saudi residents, which included 433 residents from different specialties, and showed that half of the residents lacked knowledge and interest in PC (Al-Drees et al., 2019). Therefore, implementing PC education in medical colleges can improve patient care. In this study, 53.4% of respondents were interested in knowing more about PC, 58.3% of respondents agreed about including a PC course in the MBBS curriculum, and 62.8% considered it to be very important to learn about PC. This finding is supported by a study carry out in Germany in 2011 to assess PC knowledge and attitude in fifth-year medical students. According to the Germany-based study, more than 90% of students from two different universities agreed that mandatory PC courses can increase their confidence in providing PC (Weber et al., 2011).

Regarding the factors affecting PC knowledge, lack of undergraduate PC courses, a magnitude difference was noticed in the overall knowledge between those who had any PC education, whether in the curriculum or as an elective course. This finding showed the effect of the PC course, which mandated more students' exposure to PC. The literature indicates that undergraduate PC

training and education can improve the overall level of knowledge (Eyigor, 2013; Martín-Martín, 2020). Another factor was student interest in PC. Students who have a positive view toward PC and choose related specialties as their future career, like oncology, they are interested in knowing more and admit the importance of having more knowledge through the undergraduate curriculum, which resulted in a statically significant difference in PC knowledge. This was similar to the Malibari et al. (2021) study as it showed that oncologists got the highest score in PC knowledge. Furthermore, some studies reported further factors that might influence the level of PC knowledge, such as professional work experience in a palliative unit, completion of continued training in PC, the number of encountered patients who require palliative services, having a mentor for PC, conflicts and challenges, and lack of clinical exposure in end-of-life care (Al-Drees et al., 2019; Eyigor, 2013; Gibbins et al., 2011; Martín-Martín, 2020; Nakazawa et al., 2007).

Limitations:

There were some limitations in this study. One of them was the data collection method. An online survey can reach thousands of people but also carry the risk of duplication, which was treated during the data cleaning step. Online surveys can be neglected as well. Additionally, the distribution was not equal among gender and academic year due to the response rate, especially among the one-year postgraduate group, which was only 5.3%, which does not reflect this group's actual knowledge. Therefore, it is suggested to increase the subjects' number and apply direct data collection methods like hand-to-hand surveys. Moreover, this study did not evaluate students' attitudes toward PC. The next step would be to evaluate the students' interest in the care for patients who are terminally ill to ensure that knowledge is investigated among the interested population. This cannot be investigated using the current equipment. A combination of other tools might be useful, such as the Frommelt Attitude toward the Care for the Dying patients (Murray Frommelt, 2003) or the palliative care attitude and knowledge questionnaire (Al-Ansari et al., 2019). Multiple studies showed a significant interaction between the immense knowledge and affirmative perspective toward the specialty (Abudari et al., 2014; Thi Thanh Vu, 2019). Lastly, other confounding factors affecting PCK were not evaluated, such as work experience and place of work. Some studies reported a significant correlation between working in the PC unit and having years of experience (Nakazawa et al., 2007; Thi Thanh Vu, 2019). Moreover, advance researches are needed to formulate and test factors.

5. CONCLUSION

PC is a needed specialty worldwide due to the raise in number of cases needed it. As there are less PC experts, recently graduated physicians can work as assistants in this specialty to aid the PC specialists. The study revealed that the overall level of PC knowledge was low among students, which is consistent with other similar studies with residents and nurses as the target population. However, the undergraduate PC course seems promising for improving knowledge and interest in PC among the MBBS medical students, which can help to increase the number of PC specialists in SA and improving the care provided to this population as well.

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Process of publication: Maram Alshareef

Ethical approval:

The study was approved by the Medical Ethics Committee of Umm Al-Qura University (ethical approval code: HAPO-02K-012-2021-06-690)

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Conflict of interests

The authors declare that there are no conflicts of interests.

Data and materials availability

All data associated with this study are present in the paper.

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