



Cross-sectional Study

Knowledge of pediatric palliative care among medical students in Jordan: A cross-sectional study

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ABSTRACT

Purpose: The aim of this study was to examine the medical student knowledge regarding pediatric palliative care (PPC) and determine the predictors of knowledge among them toward PPC.

Methods: A cross-sectional engaging study was directed with 326 medical students studying in Jordanian universities. A campaign utilizing online social media and Web-based software were executed to promote, enlist, overview undergraduate medical students, and gather information for this study. The authors employed four techniques to select undergraduate medical students on paid-promoted Facebook, personal messages, and postings in clinical forums.

Results: The results of this study showed that medical students have inadequate knowledge about pediatric palliative care in Jordan. The only factors that predict the knowledge toward PPC is gender.

Conclusion: it should build the medical students' information on pediatric palliative care. The pointer was not significant in the multivariate studies, and that vicariate studies indicated no distinction in the overall scores on either test among the nonmedical students, Training projects ought to be established and delivered to pediatric medical students to improve their knowledge about pediatric palliative/palliative consideration.

1. Introduction

Pediatric palliative care (PPC) is described as the effective and absolute supervision of a child's mind, spirit, and body while caring for the families [1,2]. Pediatric palliative care proceeds from the diagnosis of any life-threatening sickness using several techniques to help minimize the intensity of symptoms. The World Health Organization (WHO) [1] stated that about 21.6 million children globally require some level of PPC [3], and a 2011 survey uncovered that 65.6% of states did not have any PPC administrations, and just 5.7% had incorporated it into standard healthcare. Anticipating the developing significance of PPC in the previous decade, numerous states have begun building up their administration systems. The regulations are refining existing support methodologies, including developed nations, for example, Australia [4], Canada [5], and the UK [6], and center and developing nations like Belarus, Indonesia, and Malawi [7]. In Hong, the progress of auxiliary PPC has quite recently.

In the recent years, the PPC carried out in Jordan has been exclusively conveyed by a private institute, the King Hussein Cancer Center (KHCC). Until 2012, the KHCC has expanded the services from children

with cancer to children with life-threatening diseases. Given that the turn of events and arrangement of local PPC administrations were inadequate. The Hospital Authority has recently proposed combining a specialized PPC group into standard services alongside the opening of the Hong Kong Children's Hospital in mid-2019 [8]. As PPC administrations expand, medicinal services experts' knowledge and capacities are questioned.

Various analyses have explored the apparent difficulties of health-care service providers in offering PPC. For example, it has been accounted for that a larger part of pediatric oncologists in the UK and North America have found out about PPC through "experimentation," which inclines patients to needless damage [9]. Healthcare experts have revealed that they feel overwhelmed while experiencing children' death [10,11], unable to perceive the significance of family-focused social consideration issues in PPC [12], and subsequently experiencing issues in deciding the best medication for children [13], particularly when PPC referral was required [14]. In Jordan, pediatric physicians have seen PPC as trying considering its differences from adult mitigation alongside issues of the juvenile turn of events, low staff support [15], and the deficient passionate adapting abilities of all included [15–17]. As these

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difficulties have not yet been settled, there is a need to quickly improve the nature of care conveyed to future PPC children. The apparent problems of PPC have frequently been attributed to restricted exposure in undergrad and postgraduate studies [17–21]. Also, many students have constrained genuine involvement in children [20] needing PPC [22]. Truth is told, the significance of undergrad studies has been emphasized in a few types of research [23,24].

For the most part, all related methodological analyses have indicated modification in students' knowledge about crucial palliative care standards [25,26]. Regardless, conflicting outcomes were found in the adequacy of PPC training to invigorate students' reflection and improve their moral understanding [26]. Such varieties may arise because of the particular setting of educational plans, students' previous exposure, and their view of PPC. Considering that the undergraduate years are a brilliant period for cultivating healthcare experts' ability and enthusiasm in palliative care [26], it is important to see how medical see PPC while evaluating their educational needs. Among places where PPC is still in its early stages, this is the principal study concentrating on the knowledge, mentalities, and convictions alongside the educational needs of medical students for offering compelling PPC. So, this study aims to examine the medical student knowledge regarding pediatric palliative care (PPC) and determine the predictors of knowledge among them toward PPC.

2. Study method

A cross-sectional study utilizing social media was used to select qualified undergraduate medical students. Qualified undergraduate medical students were all students at Jordanian government universities. From April 1st through July 1st, 2020, a campaign utilizing online social media and Web-based software was executed to promote, enlist, overview undergraduate medical students, and gather information for this study. The authors employed four techniques to select undergraduate medical students on paid-promoted Facebook, personal messages, and postings in clinical forums. Interested students were informed that their cooperation might add to an expansion in the comprehension of the PPC knowledge. Undergraduate medical students were guaranteed that their recognizable healthcare data is safe because of the severe protection and security in this research. Before, undergraduate medical students can consent to take an interest in the study voluntarily; undergraduate medical students need to press the attached link that guided them to the online survey.

The survey links were given online by the research assistants. The informed consent form was attached online with the overview poll that should be marked willfully to be the undergraduate medical students before finishing the study. Students consent to sign an informed consent form; he/she completes a survey online. It took them around 10 min to finish the study. The research assistant collected the response to the online surveys in a spreadsheet and kept them in a secured personal computer. During writing of the manuscript, the authors were checked for the meeting for all STROCSS guidelines [27].

2.1. Instruments

The English version of the palliative Care Quiz of Nursing (PCQN) was utilized to gauge undergraduate medical students' knowledge into palliative care created by Ross, McDonald, and McGuinness in 1996 [18]. This instrument was show validity for another major, this why the authors used to measure palliative care knowledge among medical students. It was utilized on the grounds that English is the medium of instructions of clinical universities in Jordan. The PCQN contains 20 statements; the responses being true, false, or don't know. For each finished poll, the overall score was determined (the entirety of the number of accurately addressed items). This score can hypothetically run from 20 (least score) to 100 (greatest score). In any case, PCQN has 3 subscales (hypothetical classifications) that incorporate the

accompanying classifications: theory and standards of palliative care (items 1, 9, 12, 17), pain and symptoms management (2–20 articles excluding 5,9,12 & 17), and psychosocial and religious care (items 5, 11 & 19). Knowledge scores were classified into poor knowledge $\leq 50\%$, fair knowledge (65–50%), and ($\geq 65\%$) satisfactory knowledge. The internal consistency of the 20 item quiz was 0.78 indicating high internal consistency [15]. Nevertheless, there are three sub-scales in PCQN: (a) philosophy and PPC principles (elements 1,9, 12,17); (b) pain and management of symptoms (elements 2–4, 6–8, 10, 13–16, 18,20); and (c) psychosocial and spiritual attention (elements 5,11,19). The PCQN's main consistency of 0.78 is considered high.

2.2. Ethical consideration

Jordan University of Science and Technology (JUST) IRB affirmed this study. Qualified undergraduate medical students were given detailed data about the objectives of the study, for example, the study to utilize the data to help the college and the community, privacy of the parent's subtleties, the exploration will keep up the anonymity of the undergraduate medical students to the chief specialist and JUST's Human Research Protections Office. Also, the study was registered in UIN Research Registry 6655. The link is <https://www.researchregistry.com/register-now#user-researchregistry/registerresearchdetails/604e7953e5dc80001b82e131>.

2.3. Statistical analysis

Statistical packages IBM® SPSS adaptation 24.0 was used for descriptive statistics were utilized in portraying the socioeconomics of the study subject and the demographic characteristics. Means, range, medians and standard deviations were utilized as constant factors, while rates and frequencies were utilized for assembled measures. All the assumptions of multiple regressions were checked.

3. Results

3.1. Demographic characteristics

A total of 326 medical students successfully completed the study survey. Students from either gender participated in this study, 111 females (34%) and 215 males (66%). students' demographic and academic characteristics are listed in Table 1.

3.2. Knowledge about palliative care

The mean score of knowledge was low at 50 (SD: 7.38; range: 20 to 100). The items1, 12,16,18 had the rightest answers 86%, 88%, 91%, and 92%, individually. These items related to pain and symptom management class. All medical students' performance on these chosen items were agreeable, by and large execution of different items of theory and standards of palliative care and psychosocial and profound care was not satisfactory. The effects of this study show that medical students have inadequate knowledge about palliative care in Jordan. For instance, they accepted that the degree of sickness could decide the strategy for pain management (item 3, false), that loss of a far off connection is simpler to overcome than the loss of one that is close relatives (item 19, false), and that placebo treatment is powerful in rewarding pain (item 13, false) (Table 2).

3.3. Multiple regression analyses

Multiple regressions were utilized to predict medical students' impression of perception toward PPC (age, gender, training level, work understanding, and occupational role). Table 3 sums up the results of the multiple regression tests. The entirety of the recorded variables is not related to the view of PPC ($p > 0.05$) except gender ($B = 2.75$, $p = 0.01$).

Table 1
Demographic characteristics of medical students (n = 326).

Variable	Frequency	(%)
Gender		
Male	111	34.0
Female	215	66.0
Nationality		
Jordanian	304	93.3
Other	22	6.7
Age M = 20.99(SD = 2.15)		
Mother education		
Primary or secondary	68	20.9
Diploma	46	14.1
Bachelor	124	38.0
Graduate	88	27.0
Father education		
Primary or secondary	59	18.1
Diploma	87	26.7
Bachelor	124	38.0
Graduate	56	17.2
College level		
First year	88	27.0
Second year	45	13.8
Third year	62	19.0
Fourth year	51	15.6
Fifth year	58	17.8
Sixth year	19	5.9
Income		
Less than 400	31	9.5
400 to 600	41	12.6
600 to 800	28	8.6
800 to 1000	72	22.1
More than 1000	154	47.2
Area of living		
City	222	68.1
Village	104	31.9

4. Discussion

The medical profession is one of the main occupations in the PPC team undergraduate medical students are the future physicians and most important in the team, they assume a vital role in practically speaking and improving the PPC [28–30]. So, the most recent studies were centered on surveying the medical professionals' knowledge in alternate circumstances and settings [31–36]. Various analyses evaluated the experiments of end-of-life convictions, experience, aptitude, and the propriety of the working environment settings concerning progressive learning of palliative care among medical students in services [29]. The researchers conduct a cross-sectional study that included 326 medical students.

The research outcomes indicate that most undergraduate medical students perceived the significance of PPC. The fascinating finding is that although they obviously recognized PPC from end-of-life or terminal care, a large number of them – proposed that, inside the pediatric setting, PPC is best given when therapeutic treatment is not an alternative. Although the WHO rules grasp an integrative methodology from the time of analysis, most undergraduate medical students characterized the fair delegation for PPC in a significantly prohibitive connotation.

Three of the studies found a lack of knowledge about PPC among physicians [38–40]. The first study was embraced in Canada St-Laurent-Gagnonet et al. [38]. This study surveyed the idea of palliative care of a gathering of physicians in tertiary care of the pediatric care group of emergency clinics. Twelve physicians take an interest in the study. These physicians had a constrained idea of palliative care to the help of physical manifestations. Additionally, they didn't have data about the best and ideal opportunity to present the administration since they were not open to utilizing the palliative care term. In two review studies led in Florida and California Thompson et al. [39], researchers found that around half of the participants characterized palliative care equivalent to palliative care, and the other portion of them showed that

Table 2
Response of medical students to PPC statements (N = 326).

Items	True		Not Know		False	
	Count	%	Count	%	Count	%
1 Palliative care requires that a patient is actively dying	10	3%	35	10.7%	281	86%
2 A patient who has a DNR order should be excluded from receiving acute treatment in the form of vasopressors or mechanical ventilation	64	20%	48	14.7%	214	66%
3 Even if a child is actively dying, hope should never be discarded	56	17%	71	21.8%	199	61%
4 Parents or guardians should have a voice in determining the palliative care options for their child	24	7%	71	21.8%	231	71%
5 A hospital-wide palliative care team would be acceptable in providing family and staff support services in pediatric unit or the PICU.	192	59%	83	25.5%	51	16%
6 An ethical dilemma that arises with acute therapeutic care is whether to treat a secondary problem such as an infection when death is imminent	138	42%	75	23.0%	113	35%
7 Withholding feedings is ethically acceptable for a dying child, even if the child does not have a DNR order	141	43%	97	29.8%	88	27%
8 Withdrawing support is considered the same as withholding support for a dying child.	57	17%	54	16.6%	215	66%
9 It is easier to care for a dying child when parents and family are not present at the bedside.	183	56%	75	23.0%	68	21%
10 A most important nursing function for the dying child is to be "present" for the family.	21	6%	60	18.4%	245	75%
11 Blood product transfusions are acceptable palliative care options	44	13%	83	25.5%	199	61%
12 Palliative and EOL services should provide only pain and comfort measures	20	6%	19	5.8%	287	88%
13 Children who are actively dying should not be readmitted to the hospital for respiratory or nutritional support	115	35%	82	25.2%	129	40%
14 A DNR order is required for children admitted to palliative programs	107	33%	59	18.1%	160	49%
15 If inadequate pain control is determined in a dying child and there are no signs of toxicity, the dose of narcotic should be increased by 50%	99	30%	70	21.5%	157	48%

(continued on next page)

Table 2 (continued)

Items	True		Not Know		False	
	Count	%	Count	%	Count	%
16 Taking a photograph of a child after death is an acceptable practice despite the culture or religious background	4	1%	24	7.4%	298	91%
17 Inadequate pain control hastens death in multiple ways, including increasing physiological stress, decreasing immune-competency, and increasing the risk of pneumonia and thrombo-embolism.	259	79%	50	15.3%	17	5%
18 If a dying child on a morphine drip experiences hallucinations and irritability, the best management would be to change to another drug such as hydromorphone	13	4%	14	4.3%	299	92%
19 Research has supported the fact that loss of a child results in an increase in divorce and separation of the parents	142	44%	90	27.6%	94	29%
20 Obtaining training in palliative care will support my ability to provide EOL care for children	17	5%	65	19.9%	244	75%

Table 3

Predictors of pediatric palliative care among medical students.

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error			
1 (Constant)	77.322	4.560		16.957	.000
Gender	2.473	.949	.149	2.606	.010
Prevention reasons	-.753	.362	-.119	-2.081	.038
Income	-.398	.382	-.070	-1.042	.298
Living	-1.678	1.002	-.099	-1.675	.095
Nationality	-1.221	1.767	-.039	-.691	.490
Year	.008	.285	.002	.029	.977
Father Education	-.109	.563	-.013	-.193	.847
Mother Education	-.744	.522	-.101	-1.425	.155

Dependent Variable: palliative care.

they want to refer patients when corrective treatment was no longer suitable. Balkin et al. [40], characterized palliative care as the finish of life care started when every therapeutic choice has fizzled, and physicians' competence when managing pediatrics confronting perilous ailment was fundamentally higher when the physician got training in palliative care. Different studies researched the human services supplier's information and disposition about PPC and looking at the information and demeanor between experts [37,40,41,42]. In a Malaysian study, including 292 undergraduate medical students, 69 pediatricians, and 223 medical students, the outcomes were just a quarter of the responders thought they have fundamental palliative care knowledge, about a third believe, morphine utilized in palliative care is addictive,

and the author presumes that there is an absence of knowledge and comprehension of palliative care among healthcare services suppliers [40]. So also, in Ukraine Detsyk et al. [41] led a review to survey the familiarity with pediatric palliative care among healthcare workers. The study participants were 578 healthcare workers (131 professionals, 52 pediatricians, 36 residents, 78 healthcare supervisors, and 281 medical students).

The results showed that a quarter of undergraduate medical students didn't have an idea about the meaning of PPC, about 32% of the medical students recognize that two – thirds of member inferred it as for patients with the disease (medical students speak to 71.5% of their answers), and inferred that most of the respondents displayed a marked absence of knowledge in PPC. In another study, Spruit et al. [37] led a cross-sectional study concentrate on the United States. The study was meant to assess pediatric oncology healthcare service providers' information and convictions with respect to PPC. Just about 156 healthcare professionals took an interest in the study from different occupations (medical students and physicians). The outcomes uncovered that the greater part of the medical students studied, they did not get palliative care instruction or education, and Just 22% of physicians revealed that likewise, the author inferred that even the advancement in PPC accessibility, care offerings remain not in the degree of suggestion.

Another novel commitment of this study is the utilization of multivariate studies to figure out which variables may influence pediatric medical students' knowledge of palliative care, palliative approaches, and administrations. Utilizing the system of Cramer et al. [43], indicated that few of these elements are un-modifiable, for example, race/ethnicity and gender, and a few are modifiable, like, getting formal preparation and number of children in a medical students' caseload [43]. In any case, the outcomes from our multivariate studies recommend that across both tests, having worked in palliative care and having formal preparations were the main two regular factors that fundamentally expanded pediatric medical students' knowledge.

All past work involvement with a palliative isn't modifiable fundamentally; recruiting pediatric medical students with some palliative experience may bring about lower preparing needs and, at last, lower preparing costs. Receipt of formal palliative care preparation is a modifiable factor, and organizations that desire to create, refine, or extend pediatric palliative care projects should fuse a medical student preparing segment, it should build the medical students' information on pediatric palliative care. The pointer was not significant in the multivariate studies, and that vicariate studies indicated no distinction in the overall scores on either test among the nonmedical students, it may be the case that the medical students' degree of knowledge didn't contrast, or it may be the case that the instruments can't separate between the known groups. Psychometric studies ought to be performed to decide whether these instruments are substantial and dependable for pediatric medical students, and if not, new instruments should be created.

4.1. Limitations

It worth to mention the fact that these findings may not necessarily be applicable to all medical students in different institutions worldwide based on the culture and religion which may require different educational program based on the demographical characteristics. Another limitation disadvantage of using a convenience sample is the limitation in generalization and inference making about the entire population. Since the sample is not representative of the population, the results of the study cannot speak for the entire population.

5. Conclusion

In summary, the medical profession is one of the main occupations in the PPC team undergraduate medical students are the future physicians and most important in the team, they assume a vital role in practically speaking and improving the PPC. This study aimed at examining the

medical student knowledge regarding pediatric palliative care (PPC) and determine the predictors of knowledge among them toward PPC. The finding of this study found that medical students had inadequate knowledge about palliative care in Jordan. The only factor that predicts the knowledge toward PPC among them is gender. Training projects ought to be established and delivered to pediatric medical students to improve their knowledge about pediatric palliative/palliative consideration.

Provenance and peer review

Not commissioned, externally peer-reviewed.

Ethical approval

This study was got approval from Jordan University of Science and Technology IRB.

Consent

Confirm consent was gotten from all patients

Sources of funding

No funding was provided.

Author contribution

All authors should have made substantial contributions to all of the following:

- (1) the conception and design of the study, or acquisition of data, or analysis and interpretation of data,
- (2) drafting the article or revising it critically for important intellectual content,
- (3) final approval of the version to be submitted.

Registration of research studies

1. Name of the registry: Jordan University of Science and Technology
2. Unique Identifying number or registration ID: 20202345
3. Hyperlink to your specific registration (must be publicly accessible and will be checked):

Declaration of competing interest

No conflict of interest of any author.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.amsu.2021.102246>.

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