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Among Health Professionals: A Global Survey**

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**Evaluating Pain Management Practices for Cancer Patients
Among Health Professionals: A Global Survey**

For Peer Review Only/Not for Distribution

Abstract

Background:

Cancer incidence in the world is predicted to increase in the next decade. While progress has been in diagnosis and treatment, much is still remains to be done to improve cancer pain therapy, mainly in underserved communities in low income countries.

Objective:

To determine knowledge, beliefs and barriers regarding pain management in both high and low income countries (according to the WHO classification); and to learn about ways to improve the current state of affairs.

Design:

Descriptive survey

Setting/Subjects:

56 countries worldwide; convenience sample of 1,639 consisted of 36.8% physicians; 45.1% nurses and 4.5% pharmacists employed in varied settings.

Results:

Improved pain management services are key elements. Top barriers include religion factors, lack of appropriate education and training at all levels, non-adherence to guidelines, patients reluctance to report on pains, over regulation associated with prescribing and access to opioid anangetics, fear of addiction to opioids, lack of discussions around prognosis & treatment planning.

Conclusion:

The majority of patients with cancer in low income countries are undertreated for their pain. Promoting cancer pain accredited program of training and education on pain management for physicians and nurses is crucial; as well as advocating policymakers and the public at large.

Keywords: cancer, pain, management, global, opioids

Introduction

It is estimated that between 2010 - 2020 the number of new cancer cases in the United States went up about 24% for men and 21% for women; over the next decade it is expected that cancer incidence rates will stay about the same, however, the number of new cases will increase, primarily due to an aging white population and a growing black population.¹

Pain is one of the most common symptoms in cancer patients. Pain can be caused by the cancer itself, cancer treatment or a combination of factors. Tumors, surgery, intravenous chemotherapy radiation therapy, target therapy, supportive care therapies such as bisphosphonates and diagnostic procedures may cause pain.² Cancer pain often increases the level of anxiety and depression, and feelings of depression can worsen cancer pain, making it more difficult to control; obviously, cancer patients may become irritable, frustrated, sad and even angry. Therefore, patients should never accept pain as a normal part of having cancer.³ Most patients with cancer-related pain will require medication when experiencing moderate to severe pain (Step 2 or 3, according to the WHO guidelines).⁴ Patients need a personal approach when it comes to controlling pain. Routinely, a team of palliative care providers help to alleviate cancer patients' pain; this includes physicians, nurses, mental health specialists, social workers, as well as pharmacists and chaplains.

Recently, the International Association for the Study of Pain (IASP) updated the definition of pain, as follows: "An unpleasant sensory and emotional experience with, or resembling that associated with, actual or potential tissue damage". Further, pain is always a personal experience, influenced (to varying degrees) by biological, psychological and social factors.

While hospitalized, cancer patients, for the most part, receive appropriate treatment for pain by qualified personnel, be it palliative care specialists or anesthesiologists; yet often problems arise upon the patients' return home and, unfortunately, Family Physicians, Pediatricians, Internal Medicine Specialists and community Nurses lack the adequate training, experience and skills required to manage medication effectively. Accordingly, family carers struggle to alleviate the suffering of a beloved family member. A UK study found that family carers reported receiving minimal information or education about end-of-life medications and that they perceive managing medications as a demanding and burdensome responsibility which often provokes anxiety.⁶

As the delivery of cancer care shifts away from institutions and back to the community, primary care professionals, primarily physicians and nurses, are well-situated to meet the growing demands of new cancer cases. However, we still lack data regarding global pain management practices, which hinders global progress in alleviating suffering and improving the quality of life (QOL) for cancer patients and their families.⁷

Purpose

The overall issue of cancer pain management needs to be assessed globally; the present survey examines professionals' duties, barriers, preferred methods of training, clinical practices, patient satisfaction and regional differences (according to WHO classifications).

Methods

We employed a convenience sample of professionals (physicians and nurses). The Middle East Cancer Consortium (MECC) invited health care professionals from 56 countries to lead and coordinate a survey to be conducted in each of their respective countries. In recognition of their time and effort, coordinators who collected at least 15 completed surveys were included as authors. Each country coordinator disseminated surveys to targeted health care professionals either via a linked Google Forms file or delivered by hand. Participation was voluntary and survey completion implied consent. The Technion's (Israel Institution of Technology) Behavioral Sciences Research Ethics Committee approved this study (No. 2018-043).

Instrument Development

This survey was questionnaire-based and required no other intervention involving the respondents. The methods conformed to the ICC/ESOMAR International Code on Market and Social Research, while maintaining the anonymity of all respondents participating in the survey. Coordinators translated surveys from English into Arabic, Farsi, Spanish, Russian, Turkish and Portuguese and professional specialists performed back-translation for validity. The verification of the questionnaire was confirmed via factor analysis, determining the Cronbach's alpha. In addition, the construct validity and reliability of the tool were approved using exploratory factor analysis (EFA) and internal consistency measurements.

The final 23-item instrument took 15-20 minutes to complete, consisted of 23 questions and included quantitative and open-ended questions addressing personal demographics, assessment of education and training, use of guidelines, approach to pain assessment, attitudes concerning the treatment of cancer pain, knowledge of opioid use and perceived barriers to optimal cancer pain management.

A letter invited professional caregivers to share perspectives on duties, conditions and challenges faced when carrying out daily pain management. Surveys were distributed to professionals around the world from July 2018 through June 2019.

Data collection and data analysis

The Word format survey forms disseminated via email were encoded into Microsoft Excel sheets and merged with Microsoft Excel sheets generated from the Google Forms application. Analysis was stratified according to the WHO geographic region.

Descriptive statistics such as percentages, means and standard deviation were calculated to establish the respondents' characteristics and responses. In addition, from all of the data contained in the survey, three "outcomes" were selected: pain assessment (Q14), perceived

barriers to opioid use (Q21) and knowledge (Q22). These survey questions were chosen as outcomes as these parameters would best reflect the overall quality of cancer pain management.

Questions 14, 21 and 22 (see Appendix) were coded into sum scores. For each survey, one point was given for each answer of “yes” or “agree” (the positive answer to each of the sub-questions of Q14 and Q22, respectively). Thus, for these questions, a maximum possible score of six and a minimum possible score of zero can be obtained.

For Question 21 (perceived barriers to adequate cancer pain management), one point, two points, and three points were assigned to each answer of “highly significant,” “moderately significant,” and “insignificant,” respectively. Each response was then given a sum score for the question, taking into account all seven sub-questions and resulting in a score between 7 and 21.

For the purpose of sum score calculations in Q14, 21 and 22, missing data for a given sub-question were imputed with that country’s data by Multiple Imputation procedure to a sub-question for that question.

Statistical analysis using Kolmogorov-Smirnov and Shapiro-Wilk tests determined that the data was not evenly distributed. In addition, Levene statistics showed unequal variance across groups; therefore, conducting nonparametric tests (Mann-Whitney) was deemed appropriate. Three outcomes (pain assessment score, perceived barriers score, opioid knowledge score) were selected to compare the High Opioid Consumption Group (Group 1) and the Low Opioid Consumption Group (Group 2).

Countries were stratified by six WHO geographical regions and survey subscales were compared between Groups 1 and 2. Data was entered into SPSS (Statistical Package for Social Sciences) software. Analyses were performed using Statistical Analysis System (SAS) software. Mann-Whitney tests were performed on binomial/categorical variables for group comparisons. Analysis of variance was employed to test WHO group differences. Statistical significance level was set at $p < 0.05$.

Results

Demographics

A total of 1,639 healthcare professionals participated in this global survey (84% response rate). The average age of survey respondents was 39.78 years + 10.88 SD, of which 52.8% were males and 46.1% were females. 36.8% of the respondents were physicians, 45.1% were nurses and 4.5% were pharmacists (Table 1).

Table 1. Demographic and Practice Characteristics

Age	N	%
≤35	642	39.9
36-45	505	31.3
46-55	309	19.2

>=56	155	9.6
Missing	28	1.7
Total	1639	100
Gender	N	%
Female	756	46.1
Male	866	52.8
Undisclosed	17	1.7
Total	1639	100
Specialty	N	%
Oncology	165	10.1
Palliative Care	161	9.8
Pain Specialist	35	2.1
Anesthesiology	55	3.4
General Practice	72	4.4
Internal Medicine	90	5.5
Orthopedic Surgery	4	0.2
Neurology	2	0.1
Rehabilitation Medicine	6	0.4
Pediatrician	18	1.1
Nurse	745	45.1
Pharmacist	74	4.5
Other	114	7.0
Unknown	103	6.3
Total	1639	100
Average Years in Practice	N	%
1-5	370	22.6
6-10	337	20.6
11-15	263	16.0
16-20	222	13.5
21-25	162	9.9
26-30	121	7.4
31-35	54	3.3
>35	48	2.9
Unknown	62	3.8
Total	1639	100

Countries Represented

Physicians and allied healthcare professionals managing cancer pain were surveyed in 56 countries across six WHO Regions: Africa = 5 (8.93%); the Americas = 13 (23.21%); South-East Asia = 3 (5.36%); Eastern Mediterranean = 11 (19.64%); European = 20 (35.71%); and Western Pacific = 4 (7.14%) to assess attitudes and perspectives regarding cancer pain management.

Table 2 portrays the morphine per capita consumption as reported in 2020, classified according to WHO Regions; collected and summarized by the International Narcotics Control Board and the World Bank.⁸ The Region of the Americas with 22.0 per capita morphine consumption and the European Region with 13.8 per capita morphine consumption, representing the High Opioid Consumption Group (Group 1), comprise 62.05% of respondents surveyed. On the other hand, the African, Southeast Asia, Eastern Mediterranean and Western Pacific Regions, with per capita morphine consumption ranging from 0.21 to 0.73, represent the Low Opioid Consumption Group (Group 2) and 37.95% of all respondents surveyed (Table 2).

Table 2. WHO Regions morphine per capita consumption as of 2017 based on the International Narcotics Control Board and The World Bank (in mg/person) Created by: Walther Center in Global Palliative Care (CiGPC), Indiana University Simon Cancer Center, 2020

WHO Region	mg/capita morphine consumption as of 2017
African Regions	0.59 down from 0.73 in 2010
Region of the Americas	22.0 down from 34.0 in 2013
Southeast Asia Region	0.26 up from 0.19 in 2015. Peak was 0.45 in 2007
Eastern Mediterranean Regions	0.21 down from 0.37 in 2014
European Region	13.8 up from 10.5 in 2016
Western Pacific Region	0.73 down from 0.86 in 2016

When asked about satisfactory outcome of therapy for cancer pain, the majority of respondents in the high consumption of morphine countries (M=81.29; SD \pm 15.68) answered favorably, whereas in the low consumption countries, the response was significantly lower (M=59.04; SD \pm 24.11, <0.001) (Table 3).

Table 3: Feasibility of division by the perceived versus the actual level of patients who achieved a satisfactory outcome (Q19, Q20)

		Mean \pm SD %	Mann-Whitney Test	
			Z	Sig. (2-t.)
Question 19	High	81.29 \pm 15.68	19.27	<0.001
	Low	59.04 \pm 24.11		
Question 20	High	70.53 \pm 17.36	10.69	<0.001
	Low	38.80 \pm 23.17		

The feasibility of the division of regions is confirmed by the perceived ratio of the three “outcome” indicators: pain assessment practices, perceived barriers to opioid use and opioid knowledge (Q14, Q21, Q22, respectively) are as shown in Table 4.

Table 4: The ratio of the three outcomes indicators: pain assessment practices, perceived barriers to opioid use and opioid knowledge (Q14, Q21, Q22, respectively)

		Mean \pm SD %	Mann-Whitney Test	
			Z	Sig. (2-t.)
Question 14	High	4.42 \pm 1.79	-1.87	<0.001
	Low	4.18 \pm 1.89		
Question 21	High	13.39 \pm 3.14	-7.08	<0.001
	Low	12.26 \pm 3.41		
Q22	High	4.05 \pm 1.30	-7.61	<0.001
	Low	4.51 \pm 23.17		

Responses to questions related to three aspects of cancer pain screening: Type, Intensity and Impact on daily life activities varied by the degree of morphine consumption.

In the high consumption countries, a majority of participants from the US and Europe responded positively to all questions, versus a much smaller number of negative responses. The responses from low consumption countries in Africa, Southeast Asia, the Eastern Mediterranean region and the Western Pacific markedly differed between Groups 1 and 2, as shown in Table 5.

Table 5. Screening for Cancer Pain and Assessment of Type, Intensity and Impact on Daily Life Activities of Cancer Pain with Goals and Expectation of Pain Management, Discussed with Patient and Patients' Relatives

Cancer Pain Screening as to Type, Intensity and Impact on Daily Life Activities; Goals and expectations of Pain Management discussed with Patients and their families		Group 1 WHO Regions with High Opioid Consumption			Group 2 WHO Regions with Low Opioid Consumption					TOTAL All
		Americas	Europe	TOTAL	Africa	Southeast Asia (India)	East Mediterranean	Western Pacific	TOTAL	
Routine Screening for Cancer Pain										
Yes	n	208	525	733	17	4	292	116	429	1162
	%	71.23	72.71	72.29	68	16.67	75.65	62.37	69.08	71.07
No	n	84	197	281	8	20	94	70	192	473
	%	28.77	27.29	27.71	32	83.33	24.35	37.63	30.92	28.93
Routine Assessment of Cancer Pain Intensity										
Yes	n	235	616	851	19	23	278	162	482	1333
	%	80.48	85.32	83.93	76	95.83	72.02	87.1	77.62	81.53
No	n	57	106	163	6	1	108	24	139	302
	%	19.52	14.68	16.07	24	4.17	27.98	12.9	22.38	18.47
Routine Assessment of Type of Cancer Pain										
Yes	n	214	530	744	18	24	292	115	449	1193
	%	73.29	73.41	73.37	72	100	75.65	61.83	72.3	72.97
No	n	78	192	270	7	0	94	71	172	442
	%	26.71	26.59	26.63	28	0	24.35	38.17	27.7	27.03
Routine Assessment of the impact of Cancer Pain on daily life activities										

Yes	n	242	550	792	14	23	275	138	450	1242
	%	82.88	76.18	78.11	56	95.83	71.24	74.19	72.46	75.96
No	n	50	172	222	11	1	111	48	171	393
	%	17.12	23.82	21.89	44	4.17	28.76	25.81	27.54	24.04
Goals and expectations of Cancer Pain management are discussed with patients										
Yes	n	190	477	667	16	24	235	125	400	1067
	%	65.07	66.07	65.78	64	100	60.88	67.2	64.41	65.26
No	n	102	245	347	9	0	151	61	221	568
	%	34.93	33.93	34.22	36	0	39.12	32.8	35.59	34.74
Goals and expectations of Cancer Pain management are discussed with patients' families										
Yes	n	205	429	634	12	24	245	108	389	1023
	%	70.21	59.42	62.52	48	100	63.47	58.06	62.64	62.57
No	n	87	293	380	13	0	141	78	232	612
	%	29.79	40.58	37.48	52	0	36.53	41.94	37.36	37.43

Physicians reporting outcomes on pain assessment questions pointed to the pain quantification test via numeric scale as the most commonly used: 83.93% in high consumption countries and 77.62% in low consumption countries.

Barriers identified as patient-related barriers to opioid use included: patients' reluctance (high consumption countries, Group 1 – 22.86%, as compared to low consumption countries, Group 2 – 41.18%), fear of addiction (47.36%) and patients' reluctance to report pain (25.54%), whereas physician-related barriers to opioid use (Group 1 – 29.25%; Group 2 – 43.30%) were due to excessive regulations (30.16%) and reluctance to prescribe opioids because of strict country-wide regulations (34.85%).

Table 6 shows the comparison between Groups 1 and 2 regarding the source of knowledge of the use of opioids to manage cancer pain. Training on opioid use in medical school was reported by 10.93% and 7.08% of respondents in Groups 1 and 2, respectively. Group 1, which was comprised of more healthcare professionals (32.55%) than Group 2 (10.80%) learned about opioid use for treating pain during their postgraduate training. A higher percentage reported no training among Group 2 (13.98%) than Group 1 (10.25%).

Q11. Form training (Sub questions by numbers and % of "insufficient")	Group 1				Group 2				TOTAL	
	WHO Regions with High Opioid Consumption			WHO Regions with Low Opioid Consumption						
	Americas	Europe	TOTAL	Africa	Southeast Asia	East Mediterranean	Western Pacific	TOTAL		
At school	n	34	142	176	1	0	96	17	114	290
	%	2.11	8.82	10.93	0.06	0.00	5.96	1.06	7.08	18.01

Post-graduate	n	190	334	524	9	3	52	110	174	698
	%	11.80	20.74	32.55	0.56	0.02	3.23	6.83	10.80	43.35
Others	n	40	101	141	6	1	45	39	91	232
	%	2.48	6.27	8.76	0.37	0.06	2.79	2.42	5.65	14.41
No training	n	34	131	165	6	15	181	23	225	390
	%	2.11	8.14	10.25	0.37	0.93	11.24	1.43	13.98	24.22

When physicians were asked what guidelines they follow when treating their cancer patients' pain, 76.95% indicated that they are using guidelines; while it is used more in the high consumption countries (80.43%) versus low consumption countries (71.62%). However, in the former group of countries, the WHO guidelines were more in use; in the latter group of countries, institutional guidelines were more commonly used (28.06% as compared to 22.62%).

In response to the question the question regarding the use of opioids as the first-line treatment for moderate to severe pain (Question 22.1), 71.32% reported "agree", whereas 42.04% agreed that opioids are more effective for the treatment of neuropathic pain (Question 22.3). 73.40% of all respondents agreed that, in order to minimize side effects of opioids, non-opioid and non-pharmacological measures should be used (Question 22.5). The overall average opioid knowledge score was 4.20 SD \pm 1.31 out of 6 (Table 7).

	Average Opioid Knowledge Scores according to WHO Region						Average Opioid Knowledge Scores comparing Groups 1 and 2		
	1 Africa	2 Americas	3 S.East Asia	4 East. Medit.	5 Europe	6 West. Pacific	1 High (AmrEur)	2 Low (AfAs2Wp)	Total
	N	25	293	24	386	724	187	1017	622
Mean \pm SD	4.16 \pm 1.18	4.10 \pm 1.12	5.08 \pm 0.65	4.39 \pm 1.37	3.98 \pm 1.37	4.66 \pm 1.03	4.02 \pm 1.31	4.49 \pm 1.26	4.20 \pm 1.31

When questioned about the likelihood of developing opioid addiction as a result of cancer treatment, roughly similar answers were given by both groups.

When asked about details of their clinical practice, 71.07% of respondents indicated that their patients are screened for pain (Question 14.1), while 72.97% seek to identify the type of pain (neuropathic, somatic, etc.) (Question 14.3). Only 65.26% discuss goals and expectations of pain management (Question 14.5).

Barriers

Regarding the perceived significance of potential barriers to the treatment of cancer pain (Question 21): lack of pain/palliative medicine services and inadequate knowledge among healthcare workers were deemed "highly significant" barriers by 46.60% of respondents and at least "moderately significant" by 36.14% of respondents; excessive regulations on opioids (30.16%) and caregivers' reluctance to prescribe/administer opioids (34.85%).

Barriers related to patient factors (based on Questions 18, 19, and 20)

Respondents perceived that 67.21% of cancer patients reliably report their pain intensity and that 72.84% of patients could achieve a satisfactory outcome. More healthcare professionals in Group 1 believed that a higher percentage of patients routinely report their pain intensity more than those in Group 2 (83.93% v. 77.62%). Patients' reluctance to report pain (25.54%), patients' reluctance to take opioids (31.79%) and patients' inability to pay (31.27%) were identified as at least moderately significant barriers.

Fewer respondents in Group 1 considered patient-related barriers (patient reluctance to report pain or take opioids) as a "significant barrier" compared to Group 2 respondents (19.61 v. 34.48%). Fewer respondents in Group 1 likewise rated the lack of pain/palliative care as a "highly significant" barrier than Group 2 respondents (31.09 v. 51.80%). Overall, the average perceived barrier score (from a high of 16.63 to a low of 11.05) was similar for the two groups.

Correlation analysis

Several items were found to be correlated with the overall question of patients' satisfaction with the outcome of therapy for cancer pain. (Spearman correction coefficient = $p < 0.05$).

Analysis of Variance and Linear Regression

Pain managements issues were checked individually, and the latter were examined with perception items; using categorical variables and independent t-test for countries variables. We evaluated whether demographic, professional, psychologic and religiosity factors were different across the various pain management items using the Spearman test.

The linear regression analysis, which checked the percentage of patients who achieved a satisfactory outcome of therapy for cancer pain; compared two groups of countries according to the WHO grouping: Group 1- high income countries, while Group 2- low income countries. Significant differences were noted for many variables (Tables 8 & 8a). Female professionals in high income countries scored significantly in satisfaction with pain management provision, as did Christian and Jewish care givers in these countries; while patients in low income countries scored negatively. Concerning the effects of discussions, goals, and expectations of pain management with patients on their satisfaction, only low income countries scored significantly.

Physicians in high income countries were more likely to follow guidelines for pain management.

The issue of patients' reporting reliably to their care givers about the intensity of their pain, the patients' overall satisfaction was found to be highly significant in both the high and low income countries.

Regarding the potential barriers to optimal pain management, patients in high income countries scored negatively regarding perceived reluctance to report pain as a potential barrier, while

concurring that excessive regulations, and inability to cover the cost of palliative medicines were potential barriers.

Patients in high income countries, were less likely to use non-opioid and non-pharmacological interventions.

The likelihood of developing opioid addiction were higher in low income countries.

Table 8. Linear Regression Models: β Estimates with p-Values

Outcome												
Patients' satisfaction from therapy for cancer pain												
Variable	High income countries (p<0.05)					Low income countries (p<0.05)						
	Gender	Religion			Expectation	No Guidelines	Gender	Religion			Expectation	No Guidelines
		Christian	Jewish	Muslem				Christian	Jewish	Muslem		
Unstd coeff	3,766	6.298	7.02	NS	NS	-4.297	NS	NS	NS	-12,323	7.192	NS
β -coefficient	0.114	0.183	0.122	NS	NS	-0.104	NS	NS	NS	-0.25	0.142	NS
p-value	<0.001	<0.001	<0.001	NS	NS	0.001	NS	NS	NS	<0.001	0.001	NS
NS- Not significant												

Table 8a. Linear Regression Models: β Estimates with p-Values (Cont.)

Outcome						
Patients' satisfaction from therapy for cancer pain						
Variable	High income countries (p<0.05)			Low income countries (p<0.05)		
	Profession	Reporting	Addiction	Profession	Reporting	Addiction
Unstd coeff.	NS	0.196	NS	-6.863	0.386	6.028
β -coefficient	NS	0.24	NS	-0.115	0.337	0.204
p-value	NS	<0.001	NS	<0.001	<0.001	<0.001
	N= 905			N=604		
	R2=0.205			R2=0.389		
	p<0.001			P<0.001		
	NS- Not significant					

Discussion

It has been consistently argued that in most low income countries patients suffering from cancer face difficulties in managing their cancer-related pains and that due in part, to lack of training, cultural beliefs and various regulatory procedures. Recent study indicated that 50.7% of all cancer patients experience pain.⁹ Accordingly, we were not surprised that in the present survey 81.29% of the respondents in high income countries were satisfied with the outcome of the pain therapy, as compared to only 59.04% in low income countries. The present study pointed

toward several factors responsible for the current situation. One of the factors refers to the lack of a standardized methodology for the assessment of pain, a factor that relates to both groups of income levels. Therefore, expanding the knowledge and skills in addressing pain should continue to be a high priority for all care givers handling cancer-related pain. Moreover, pain assessment and treatment that applies the best available evidence and accepted standards of care should be individualized and physician-driven.¹⁰

Barriers

An important lesson learned from this study is the practice of pain screening is still a serious problem in low income countries, as many patients do not report the true type and intensity of their pain to their physician. This may be especially important given that both cancer diagnosis and treatment are often delayed and in a substantial number of patients with the disease has already reached advanced stages.

This fact makes the treatment choice a genuine problem. Also, clinicians perceive family-related and patient-related factors as the most important barriers to discussions regarding goals of care. In fact, all health care professionals are viewed as playing important roles in addressing goals of care. Our survey revealed that in both groups of countries the responses to the question related to discussing goals of care with both patients and family members were very similar. These findings have implications for the future development on interactions aimed at improving communication about goals of care among clinicians, patients and families. Often, family members and patients face difficulty accepting a poor prognosis as it causes high levels of anxiety and denial. Therefore, effective communication skills are needed to navigate these strong feelings, and yet clinicians often report discomfort in responding to the emotional reactions of patients.¹¹ Our findings underscore and support a recent call for more and better training for all clinicians in having more and better palliative training.^{12,13} Better communication skills will undoubtedly improve the ability to build rapport, listen with empathy and discuss prognosis which in turn will be important in future interventions.¹¹ Furthermore, face-to-face educational interventions have good potential to improve cares' knowledge and self-efficacy to pain management.⁶ Our study showed that whereas 80.45% of clinicians in high income countries follow guidelines for treating pain; only 71.62% of clinicians in the lower income countries follow any guidelines. By and large oncologists realize that cancer patients constitute a vulnerable patient population, and they will continue to develop and use all the latest advances in providing comprehensive approach to manage pain; relying on physicians-developed guidelines.¹⁴ Thus, many of the barriers to effective pain care have to be removed, otherwise efficient and evidence-informed pain care cannot be realized.¹⁰

Patient education is essential for planning treatment that maximizes opportunities for the adequate alleviation of pain. Barriers exists regarding sufficient pain control using medication such as opioids. In the present study 71.32% of respondent's in high income countries agree that opioids should be used as first line medication, and only 42.04% in low income countries. Reasons for this finding include fear of analgesics and of association between pain and disease progression. Beginning in the 2010s, many US states began enacting regulation to curb inappropriate opioid prescribing amidst the growing epidemic of opioid overdose deaths. An unintentional consequence of those regulations, is that it became much harder for people with cancer to access pain medications, even at the end of life.¹⁵ As noted in the present study, inadequate management is most prevalent in underserved communities in the low-, middle income, and impoverished counties. Among the factors contributing to undertreatment of cancer

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4 pain include patients' fear of becoming addicted to opioids.¹⁶ Furthermore, geographical
5 disparities between various locations, physician stigma with prescribing these medications, and
6 training required to prescribe opioid analgetics make access to these treatments difficult for
7 patients.¹⁷
8

9 In the future, the evaluation of the influence of cultural- social- economical backgrounds as well
10 as the differences between the various specialists involved in the care of patients with cancer,
11 should be explored to better understand physicians' barriers and more effectively address them
12 in international and national programs.¹⁸
13

14 The present study also identified that physicians in high income countries receive their
15 knowledge about the use of opioid in part during their medical studies, more during their post-
16 graduate training and about 10% did not receive any training at all. In the low income countries
17 the situation is worse, as about 14% did not get any background education and training at all.
18 This situation leads to misconceptions in terms of knowledge about prescribing opioids, and in
19 order to overcome this barrier, more attention must be given to improving the curriculum and
20 integrating it into clinical practice.¹⁹
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22
23

24 A large majority of respondents agree that non-pharmacological interventions should be used.
25

26 This study, the first global cross-sectional survey of professionals (physicians and nurses), has
27 identified that many cancer patients were not satisfied with the management of their cancer
28 pain. Because nurses (both in hospitals, hospices and at the patients' home) have more direct
29 contact with patients/families, they are in a better position to improve patients' symptoms and
30 sense of well-being; by getting to know patients as individuals and learning about their lives in
31 the context of an ongoing relationship.
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33

34 **Summary**

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36 Pain management should aim to fully rehabilitate patients, rather than merely to relieve pain. In
37 order to achieve this goal a more comprehensive education of physicians and allied health
38 professionals regarding state-of-the-art pain management is crucial. Although some progress
39 has been done in this area, yet further provision and incentivization is required; and in order to
40 achieve it, a fully integrated interdisciplinary pain service should ideally be available.²⁰
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43 **Limitations**

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45 Findings should be interpreted in view of the foregoing limitations. Data were collected using
46 convenience sampling. Selection bias is another limitation. Some questions had missing data,
47 resulting in nonrandom missing information. These limitations pose challenges in that findings
48 many not be generalizable.
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50 Another potential limitation in this study is its scope in terms of breadth and depth when
51 considering the diversity of cancer pain management present in each country within a given
52 region. Moreover, this study of only 56 countries out of 185 countries (30.2%) was included under
53 the Global Cancer Statistics 2020 Project.
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Moreover, this study presents the barriers to adequate cancer pain management from the standpoint of health care professionals only and does not consider the patients' perspectives. Another caveat is that practices culled from surveys convey only the respondents' perceptions; hence the data presented may not accurately reflect empirical clinical practice.

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