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Pain Management in Hospitals: Assessment and Evaluation

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ABSTRACT

Objectives

Despite the increased focus on pain management, suboptimal pain control has been frequently documented to negatively impact patients' health. This study evaluates pain management practice and its impact on daily activities.

Methods

A prospective cross-sectional study was conducted in two hospitals from April to July 2017. A face-to-face questionnaire was filled out regarding pain scores, and appropriateness of therapy as the main outcome measure. Medical and surgical adult patients with all pain types were eligible to participate. Data on medication regimens and combinations were collected from medical records. The association between categorical variables was evaluated using Pearson x^2 or Fisher's exact tests and continuous variables using student (independent) T-*test*. An alpha of <0.05 was considered significant.

Results

Results from 183 participants with a mean age of 49 (SD=17.33) revealed that pain was their main reason for hospitalization in 71.4% of the cases. Inappropriate therapy was detected in 70.5% of the cases regardless of pain severity. We noted also that only 24.6% had complete follow-up during the first 48 hours. Unfavorable practices included lack of pain assessment prior to drug administration (41.5%) and lack of pain score documentation (54.6%). Adequacy of therapy was also dependent on insurance health coverage (p=0.009).

Conclusion

Pain remains a prevalent problem that requires efforts for improvement. Our study highlights the need for implementing international recommendations to minimize risk and optimize pain management.

Keywords: *Analgesia appropriateness; Pain intensity; Pain score; Pain management.*

INTRODUCTION

Pain is defined as a universal health problem that has been recognized as "*an unpleasant sensory associated with actual or potential tissue damage*".[1-3] it has been reported to be the major reason for hospital admission in almost 75% of hospitalized patients.[4-5]

Despite the recommendation of the American Pain Society (APS) that pain should be assessed as a fifth vital sign[1,3,4], undertreatment of pain remains a global concern. In fact, many studies suggested that 70% to 80% of hospitalized patients have unsatisfactory pain control.[6] Although the Joint Commission on Accreditation of Healthcare Organizations and the American Society of Anesthesiologists addressed patients' rights to have effective pain management,[7-8] insufficient knowledge of pain management leads to inadequate pain management and control.[9-11]

In the Middle East, the literature pertaining to the appropriateness of pain management is still scarce.[12] Despite the emphasis of the National Committee for Pain and Palliative Care to set standards to improve pain management in Lebanon, many patients still suffer from pain.[13-14] Moreover, multiple studies have shown that documentation of pain assessment is not consistently done.[15-18] A study conducted by Ramia, E. et al showed that documentation of pain intensity was not completed for more than 90% of patients.[19]

Suboptimal pain control has been frequently documented to negatively impact patients' health and only a few observational studies addressed pain management with a follow-up assessment during a hospital stay.[15,20] Thus, such an evaluation is crucial. Accordingly, this study aims at 1) the estimation of the prevalence of pain in the hospital setting and its impact on daily activities, and 2) the evaluation of the appropriateness of pain management of patients receiving analgesics. Secondary objectives were the evaluation the appropriateness of care with respect to analgesia with regard to the patients' medical health coverage.

METHODS

Study Design and Setting

A prospective, descriptive, cross-sectional study using survey methodology was conducted from April to July 2017 in two private tertiary-care hospitals in order to estimate the prevalence of pain, its severity, and the appropriateness of pain management.

Patients' surveys were used to describe patients' pain intensity and interference with daily activities. Other information such as the methods of pain assessment and their documentation by Healthcare Providers (HCPs) were also obtained from patient medical charts, physician orders and nurses' progress notes.

Study Population

The study targeted all inpatient adults who experienced the pain of any origin during their hospital stay. Eligible patients for inclusion were alert adults who have been hospitalized for at least 24 hours and prescribed at least one analgesic. This was identified by a pain medication order arriving at the hospital pharmacy. Excluded patients were pediatrics (<18 years old) or elderly (>85 years old) and those with cognitive impairment, critically ill, or unconscious. Patients discharged within 24 hours or less and those who were missing complete medical records used for data collection were also excluded from the study. Participants of the study were distributed among the following medical departments: Internal Medicine (IM), Cardiac Care Unit (CCU), orthopedics, and obstetrics. Medications indication was properly assessed by making sure that pain killers were prescribed for their analgesia rather than antipyretic effect. Vital signs and the temperature of each patient were checked by referring to nurses and progress notes or physician orders. In case of doubt, interviewers asked the nurses of each medical department about the reason of the analgesic administration and referred always to the patients to inquire more about their pain status.

Tool for Data Collection

Face-to-face questionnaires, divided into two sections, one for the description of pain intensity, and another for the assessment the appropriateness of therapy, were developed in English and then translated to Arabic. The questionnaire was designed in congruence with the American Pain Society Patient Outcome Questionnaire that is already validated (Internal reliability: alpha Cronbach's score of 0.89) and modified to align with the study.[21-22]

Participants were asked to answer the following questions: 1) demographic features including age, gender, educational status, occupational income, health insurance, and marital status; 2) pain intensity measured with the items "*least*" and "*most*" severe based on Numerical Rating Scales (NRS) with answer options ranging from 0 to 10, where 0 reflects no pain and 10 worst pain possible; 3) pain interference with activities (walking, sitting, and standing) and sleep with answer options also from 0 to 10; 4) pain evaluation by an HCP, patient education regarding treatment, and timely delivery of intervention; and 5) follow-up of patient's pain after 48 hours from the initiation of the first prescribed analgesic with new pain scores recordings as well as treatment modifications.

Pain evaluation by HCPs section included 1) patient's recall if pain intensity was communicated with any HCP; 2) the existence of documentation of pain scores in patients' medical files; 3) patient's education regarding therapy; 4) timely delivery of intervention; and 5) follow-up of any HCP with the patients.

The investigators referred to the patient's charts, physician orders, and nurses notes to record the major chief complaint, history of present illness, co-morbidities and home medications as well as both non-pharmacological (e.g. physical therapy, deep breathing, walking, cold pack, heat application, distraction like watching television, reading and bed rest) and pharmacological interventions used to alleviate pain. Pain assessment by an HCP (e.g. nurse, physician, etc.) was checked by making sure that this latter asked, at least once, about the pain experienced by the patient and kept any record of any pain score in any documented file. Information such as follow-up of pain by a healthcare professional during the patient's hospital stay, patient education by a healthcare provider regarding pain treatment; and timely delivery of the intervention was also recorded.

Data Collection and Study Settings

Well-trained third-year pharmacy students, with the main investigator, approached the patients asking for their willingness to answer the questionnaire. Eligible patients for inclusion were identified by a pain medication order arriving at the hospital pharmacy. Interviewers were making sure that medications such as Acetaminophen (APAP) and Non-Steroidal Anti-Inflammatory Drugs (NSAIDs) were prescribed for pain rather than fever reduction. That was done by referring to nurses and progress notes or physician orders and by checking the vital signs of each patient especially the temperature. Any temperature below 38oC was not considered to be a fever. Then, they referred to the patient's medical records and progress notes to record administered medications

and check for adverse effects. As a second step, a follow-up after 48 hours from the initiation of therapy was done to check for modifications and assess the appropriateness of pain management. Upon completion of the questionnaire, each interviewer placed the collected questionnaire in a sealed envelope in the central pharmacy department then it was submitted to the primary investigator at the end of each week.

Definition of Appropriateness of Therapy

Adequacy of pain management on the first day of therapy and after 48 hours of follow-up was based on either appropriate drug regimens or combinations.[23,24] These were evaluated according to World Health Organization (WHO) ladder that categorizes pain into mild (NRS score of 1–3), moderate (NRS score of 4–6), and severe (NRS score of 7–10) and defines treatment and analgesics combination according to each category.[25] For mild pain, non-narcotic analgesics are prescribed around the clock (acetaminophen, NSAIDs). For moderate pain, some opioids can be added to the treatment at a total daily dose of 400mg/day of codeine and 80mg/day of oxycodone. For severe pain, strong oral opioids are prescribed around the clock (morphine, fentanyl, meperidine, etc.). Adjuvant medications that can help to enhance the effects of non-opioid and opioid analgesics to therapy can always be prescribed regardless of the pain severity Tricyclic Antidepressants (TCAs) and anticonvulsant medications such as gabapentin, pregabalin, and carbamazepine).

Improper drug regimens were defined as any error in dose, route, dosage interval, or an error in the scheduling basis of pain medication. Inappropriate drug combinations were defined as either wrong drug or combination of medications according to pain severity categories defined by the WHO or duplicate therapy.[26-27]

Appropriate pain management was considered helpful when the management resulted in a decrease in pain score and pain relief of 50% and more.[1] A new pain score was then recorded after 48 hours by using a new NRS score and checking the appropriateness of therapy amendments.

Sample Size and Statistical Analysis

Using Epi-info TM 7 for calculation of the sample size and since it is a cross-sectional study in which the primary endpoint is the prevalence of pain in hospitals, a total number of 170 participants were required to participate (using 75% as the prevalence of pain in Lebanese hospitals[15] and a precision measure of 6.5%).

All variables were entered into SPSS 22.0©. Descriptive statistics were used to describe patients 'characteristics. Pain prevalence was determined by the frequency of hospitalized patients reporting pain. Pain characteristics such as severity, method of pain assessment, and pain impact on daily activities were summarized. Relationship between categorical variables such appropriateness of therapy, reasons for inappropriate management and its relationship with medical class coverage were examined using Pearson's Chi-squared or Fisher's exact test when a condition of any expected cell count in a 4x4 table is less than 5. Comparison of continuous quantitative variables such as means of pain score was analyzed using student (independent) T-test. An alpha level of ≤5% was used to detect statistical significance. Valid two-sided p-values were reported.

Ethics Approval

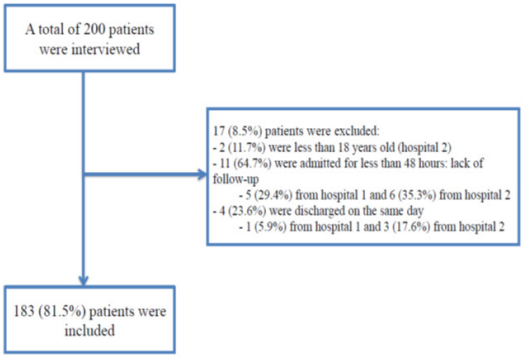
The study was completed in accordance with the Ethics Code set and approved by the Medical Directory of both hospitals. Participation was voluntary and oral consent was taken from each participant.

RESULTS

Participants Recruitment and Baseline Characteristics

As shown in Figure 1, a total of 200 patients were eligible to participate in the study. 82 of which were selected from hospital 1 and 118 from hospital 2. Of them, 183 (91.5%) patients met the inclusion criteria and completed the questionnaire, whereas 17 (8.5%) patients were excluded. The most common reason for exclusion was the lack of follow-up due to the hospitalization of fewer than 48 hours.

Figure I. Participants Flow Chart



There was a similar distribution of the gender groups. The participants' mean age was 49 [19-85] (SD=17.3). Patients were distributed among four different hospital units: 127 (69.4%) from internal medicine, 29 (15.8%) from obstetrics, 15 (8.2%) from CCU and 12 (6.6%) were from the orthopedics unit. Around 64% were admitted with health coverage of a second medical class versus 21.9% were from the first class and 13.1% from the third class. The socio-demographic characteristics of the participants are listed in Table 1. Acute infections were recorded in 49 participants (26.7%) as the main chief complaint, 15 (8.2%) were obese and underwent gastric sleeve and 12 (6.5%) had heart problems.

Table 1. Patients' demographic characteristics

	N	%
Gender		
Male	74	40.4
Female	109	59.6
Age		
19-30	35	19.1
31-40	30	16.4
41-50	22	12.0
>50	96	52.5
Health coverage		
Self-payer	23	12.6
NSSF and/or insurance	139	76.0
MOH coverage	12	6.6
Others	9	4.9
Medical class		
First	40	21.9
Second	117	63.9
Third	24	13.1
Highest level of education		
Not completed	68	37.2

High school degree	73	39.9
University degree	42	23
Income Status		
Poor	22	12
Fair	57	31.1
Good	17	9.3
Marital Status		
Single	34	18.6
Married or divorced	139	76
Widowed	10	5.5
Unit		
IM	127	69.4
Obstetrics	29	15.8
CCU	15	8.2
Orthopedics	12	6.6
Surgery		
No	83	47
Yes	97	53
Smokers	78	42.6
Allergies		
NSAIDs	4	7
APAP	2	1.1

NSSF= National Social Security Fund; MOH= Ministry of Health; IM= Internal Medicine; CCU= Cardiac Care Unit; NSAIDs= Non-Steroidal Anti-inflammatory Drugs; APAP= Acetaminophen.

Eighteen (9.8%) were admitted because of bone fractures. 14 participants (7.7%) were pregnant women who underwent c-section or abortion. The majority had hypertension as a past medical problem (36.6%), 15.3% diabetes, 10.9% dyslipidemia, 2.18% osteoporosis, and 7.6% cancer. We noted also the presence of other co-morbidities in the total patients (62.5%) such as rheumatoid arthritis, gastro-intestinal diseases, ophthalmic problems, hemorrhoids, and chronic kidney diseases, etc. Forty-seven participants (25.4%) reported to have undergone past surgeries, and 125 (68.2%) were given analgesics before admission. The mostly prescribed home analgesics were APAP (53%), ketoprofen (4.9%), ibuprofen (3.8%), diclofenac (3.8%), and tramadol (2.7%) either on regular basis or as required.

Primary Endpoints

Prevalence of pain: Around three-quarters (71.6%) of the patients receiving analgesics reported that pain was the main reason for hospitalization while the pain was present after an operation in 98 cases (54%).

Pain intensity, characteristics, and impact on quality-of-life indicators: When asked about the severity of pain at the initial visit using a numeric rating scale, 156 patients (85.2%) described their pain as severe at its highest intensity whereas only three patients (1.8%) described it as severe at its least. They varied in their description of pain at its least severity and reported pain of different intensities: mild (69.2%) and moderate (29%). Most of the patients reported that pain interfered severely with their daily activities: 84 (46%) determined that pain severely interfered with their ability to turn and reposition in bed. A similar number of patients reported that they could not do activities out of bed such eating well, walking and sitting on a chair (49.1% as severe versus 41.5% as moderate). Similarly, pain interfered moderately with the ability of patients to fall or stay asleep (41.5%). More details about pain characteristics are listed in Table 2.

Table 2. Disease characteristics and pain severity and assessment

	N	%
Current illness		
Acute	123	67.2
Chronic	60	32.8
History of Present Illness		
Acute infections	49	26.7
Heart Problems[a]	12	6.5
Bone Fracture	18	9.8
Gastric sleeve	15	8.2
C-section	12	6.6
Abortion	2	1.1
Past Medical History		
Hypertension	67	36.6
Diabetes mellitus (I, II)	28	15.3
Dyslipidemia	20	10.9
Osteoporosis	40	2.2
Gastrointestinal diseases	5	2.7
Rheumatoid arthritis	2	1.1
Cancer patients	14	7.6
Past surgery		
No	136	74.6
Yes	47	25.4
Home analgesics		
APAP	97	53
NSAIDs[b]	23	12.5
Tramadol	5	2.7
Pain was the chief complaint	131	71.6
Worst pain severity		
Mild to moderate[c]	26	14.2
Severe[d]	156	85.2
Scale used to measure pain		
Verbal	23	12.6
Numeric	3	1.6
Pattern of pain		
Continuous	58	31.7
Comes and goes	113	61.7
Gets worse in the evening	8	4.4
Pain makes the patient feel		
Anxious	82	44.8
Depressed	41	22.4
Frightened	56	30.6
Insomnia	53	29
Weak	45	24.6
Nausea and vomiting	53	29
Pain severely interferes with[e]		
Turning and repositioning in bed	84	46
Daily activities out of bed	90	49.1
Falling asleep	69	37.7
Staying asleep	64	35

Breathing	49	26.8

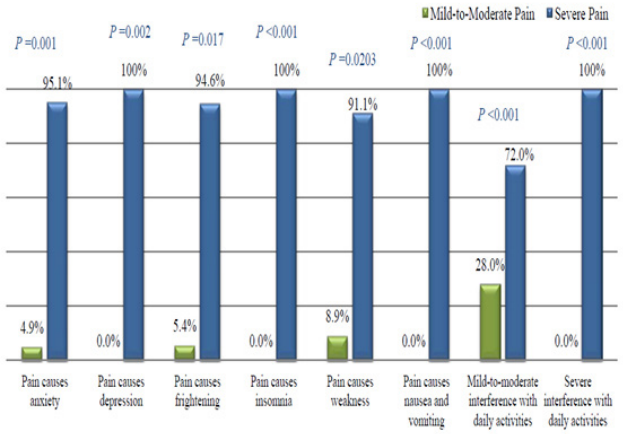
APAP= acetaminophen; NSAIDs= Non-steroidal anti-inflammatory drugs

[a]Heart Problems defined as angina or previous myocardial infarction or previous percutaneous coronary intervention with or without stent or heart failure; [b]NSAIDS were limited to ibuprofen, ketoprofen and diclofenac; [c]Pain score of 0 to 6; [d]Pain score of 7 to 10 (according to the World Health Organization's three-step ladder for pain management); [e]Scores of 7 to 10

After 48 hours of follow-up, new pain scores were recorded. The majority reported to have mild pain (n=110; 59.4%), 35.5% (n=66) moderate pain and only two (1.2%) severe. A total of 113 patients (61.7%) described their pain as intermittent while 58 (31.7%) described it as continuous. The majority (35.5%) of patients described their pain as aching, 19.7% as unbearable, 14.2% as stabbing and dull, whereas similar percentages varied among other pain characteristics such as burning, numb, and cramping (approximately 10%).

Pain severity appears to be also associated with a number of quality-of-life indicators (Figure 2). As the patient's pain severity increases, participants were more likely to report insomnia [53 patients (100%) for severe pain, p<0.001] and anxiety [4 (4.9%) mild and 78 (95.1%) severe pain, p=0.001]. Similarly, participants reported that pain caused them to feel depressed [41 (100%) with severe pain, P =0.002] and more frightened [3 (5.4%) for mild-to-moderate pain and 53 (94.6%) for severe pain, p=0.017].

Figure 2. Pain interference with QOL indicators



Pain management evaluation: Results from the first day of admission revealed that 82 patients (44.8%) were prescribed one analgesic, 89 (48.6%) two, nine patients (4.9%) three and one participants only (0.5%) four different pain medications. Two patients were not given any pain medication. Adjunct therapy, such as gabapentin, was given to one patient whereas hyoscine butyl bromide was prescribed for eight patients (4.4%) and phloroglucinol for six patients (3.3%). Acetaminophen, ketoprofen, and meperidine were the most frequently prescribed (95.1%, 34.4%, and 15.3% respectively). After 48 hours follow-up, it was shown that a total of 102 participants (55.7 %) were maintained on one analgesic and 11 (6%) were not discharged on any treatment, while the percentage of patients maintained on two and three analgesics decreased to 62 (33.9%) and 8 (4.4%) respectively. Side effects were detected in 34 participants (18.6%). Common side effects were constipation (6%, n=11), nausea/vomiting (4.9%, n=9), heartburn (4.4%, n=8), and dizziness (4.4%, n=8). As for the non-pharmacological methods for pain relief, they were used by 37 patients (20.2%). The most commonly used were distraction (6.6%, n=12), bed rest (6%, n=11), deep breathing (5.5%, n=10), and exercises like walking (4.4%, n=8).

Appropriateness of therapy: Several unfavorable management practices related to pain assessment and management were reported in both medical and surgical services. These included the following findings: (1) HCP not approaching patients to ask about their pain severity before prescribing pain medications [76 patients (41.5%) were properly assessed versus 39.9% (n=73) not sufficiently assessed and 11.5% (n=21) not assessed at all]; (2) pain score was not recorded on medical files (54.6%, n=100); (3) patients not being provided with sufficient education regarding the importance of pain reporting and management (53.6%, n=98); (4) patients having to wait for more than 30 minutes before getting the pain medication when requested (7.7%, n=14); and (5) patients asked about pain medications but were not given (10.9%, n=20).

On the first day of admission, inappropriate drug regimen (as defined earlier) was the most commonly detected in patients with severe pain (n=8; 61.5%) when compared to mild to moderate pain (n=5; 38.5%) (p= 0.014). The results have also shown that regardless of pain severity on day 1, the choice of drug combinations was considered inappropriate [98 patients (86%) with severe pain versus 16 (14%) in patients with mild to moderate pain] (p= 0.082). The same pattern was observed for appropriateness of pain management after 48 hours from the initiation of pain therapy for both drug combinations and drug regimens (Table 3).

Table 3. Pain management with regard to severity at day 1 and day 3

	Mild-to-Moderate	Severe	*p*-value
Reduction in NRS during admission	2.61±0.14	5.46±0.44	<0.001
Appropriate Therapy on day 1?	6 (10.7%)	50 (89.3%)	0.359
Reasons for inappropriate treatment on day 1			
Wrong drug combination[a]	16 (14%)	98 (86%)	0.082
Wrong drug regimen[b]	6 (38.5%)	8 (61.5%)	0.014
Appropriate therapy after 48h?[c]	20 (18.2%)	90 (81.8%)	0.058
Reasons for inappropriate treatment on day 3			
Wrong drug combination[a]	4 (6.2%)	61 (93.8%)	0.208
Wrong drug regimen[b]	1 (33.3%)	2 (67.7%)	0.22
Pain management was helpful[d]	20 (13.4%)	129 (86.6%)	0.846
Appropriate follow-up during the first 48 hours	2 (4.4%)	43 (95.6%)	0.084

NRS= Numeric rating scale

[a]According to the World Health Organization's step ladder for pain management

[b]According to proper drug dose, route of administration and dosage interval or frequency

[c]Appropriate pain measurement and assessment

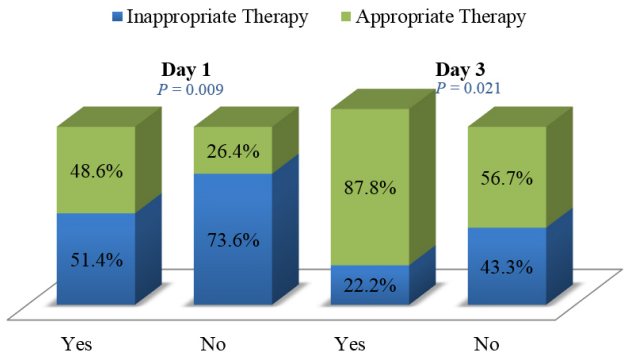
[d]Regardless of appropriateness of treatment

After the follow-up on the third day, results showed that regardless of pain severity, 47% of the patients did not receive a proper follow-up, 26.8% were inconsistently followed up and only 24.6% had proper follow-up regarding their pain status. Failure to follow-up on pain was defined by the absence of any pain assessment technique, statement or scale during any of the first 48 hours.

Secondary Endpoints

Appropriateness of therapy with regard to medical health coverage: Our results have proven that as the class of private medical insurance increased from first to third, the percentage of patients who received appropriate therapy decreased. In fact, 18 patients (48.6%) with the first insurance class received appropriate therapy versus 38 (26.4%) in the second or third class (p=0.009). When referring to Figure 3, this trend was also shown in the results of the appropriateness of therapy on the third day of follow-up (p=0.021).

Figure 3. Medical class coverage according to appropriateness of therapy



DISCUSSION

This study revealed that 71.6% reported pain as their main reason for hospitalization. These results are comparable with other studies that demonstrated that pain is present in more than 40% of hospitalized patients[28] especially the study conducted by Zeitoun A, et al. in which severe pain was shown to be the main cause for hospitalization.[15]

When asked about their pain intensity, the majority of patients were categorized as having severe pain (85.7%) on their first day of hospitalization. A widespread subjectivity in reporting pain intensity during the different assessment time points was also demonstrated. This is in congruence with the definition of pain by the International APS whereby pain is referred to as an emotional experience.[4]

Since validated methods for pain intensity measurement include Visual Analog Scale, NRS, etc., which have been proven to be highly correlated with none of them superior to the others[29,30] the pain intensity data in this study was collected and reported based on the NRS.

In our study, we confirmed that, as pain severity increased, it had a greater impact on some quality-of-life issues such as sleep deprivation, depression, and anxiety. These findings were similar to the results of McCarberg BH, et al. which demonstrated that pain had deleterious effects on mental health, employment status, sleep, and personal relationships.[31] Similarly to other studies,[15,31-33] inappropriate pain therapy was detected in the majority of patients regardless of pain severity. Inappropriate drug regimen was the most prevalent among patients with severe pain (61.5%) when compared to mild to moderate pain (38.5%) (p= 0.014). Dose, route, and frequency of pain medications were not properly taken into consideration as well as the combination of medications were not respected in a way to follow the WHO recommendations and ladder of pain. Such results support the findings of Zeitoun A, et al. who reported that as pain severity increased, the quality of pain management decreased. On the other hand, inadequate follow-up by an HCP was one of the major concerns of this study. In fact, only 24.6% of the hospitalized cases were followed up during the first 48 hours whereas the majority of them did not receive adequate follow-up. These results are consistent with previous studies in the region in which it was shown that only the minority of the patients had an adequate follow-up.[15] Such results show that efforts to improve pain management are not well implemented and increase the risk of inadequate therapy. The reason behind this risk lies within the fact that despite inappropriate practices, most patients still find that pain management is helpful. Therefore efforts to establish an adequate assessment of pain will less likely to be exercised.

Moreover, an-intervention-necessitating finding in our study was the selection of more cost-effective medications to orient the treatment procedure. According to our findings, patients of lower medical insurance classes received less adequate pain management than those of higher class (first insurance class). This inequality in health care coverage concerning pain management was also shown in previous studies conducted in the region.[13,15,19] However, this study provided optimistic data that can be explained by the fact that only 7.7% of the patients had to wait for more than 30 minutes before getting the pain medication when requested and only a low percentage (10.9%) of them did not get any additional analgesia for their increasing pain. Moreover, almost half of the recruited participants were provided with sufficient education regarding their pain status and therapy. Accordingly, such favorable practices involving patient engagement in the care process could the helpfulness of therapy regardless of pain severity.

To our knowledge, this study is among the few epidemiological studies conducted in the region to evaluate pain prevalence in Lebanese hospitals and assess the appropriateness of therapy. In addition, the tool for data collection is based on a validated questionnaire which significantly high Cronbach alpha scores. Furthermore, aside from being a descriptive study with voluntary convenience sampling, a follow-up of pain was done after 48 hours from the beginning of pain therapy which strengthens our findings. However, some limitations must be underlined. First, we did not take into account pain management in the emergency department; in fact, drugs given to patients at the time of that evaluation could influence pain evaluation. Another limitation is the interviewer bias since multiple interviewers were incorporated. For this reason, prior training and the use of a single version of the questionnaire were adopted. Moreover, many participants didn't recall previous medical actions regarding their pain which might introduce a recall bias; in this case, investigators were encouraged to collect missing information from patient medical charts. Some confounding factors may also affect negatively the external validity of our studies such as the existence of some precautions that influence the choice of medications and the preference of one drug over another. For instance, appropriateness of therapy was measured based on the WHO recommendations solely without taking into consideration each patient conditions which may modify the treatment. To add, by only including the patients who received an analgesic in our study, we risked to potentially exclude those whose pain was potentially ignored or perhaps being treated without any analgesic.

CONCLUSION

Despite the growing evidence on pain management and the availability of evidence-based clinical guidelines, the pain still lacks adequate management. Lack of adequate assessment remains the major factor of undertreatment of pain. There is ample evidence that appropriate knowledge of the prevalence of pain, its causes and intensity, and adequate use of analgesics at the right intervals can provide good pain relief for

the majority of patients. Thus, institutions should place their effort on continually evaluating the quality of pain management, educating both the patients and health care professionals and stressing on adherence to clinical guidelines, which are paramount for effective pain management.

TRANSPARENCY AND CONFLICTS OF INTEREST

We declare that the corresponding author is a full-time employee at the Lebanese Order of Pharmacists, Drug Information Center Department. ISKANDAR Katia is the chief pharmacist of the Lebanese Canadian Hospital and an associate professor at the Lebanese and Beirut Arab Universities. Both the authors contribute equally to the conception and design of the study. The author SALAMEH Pascale is a full-time Professor at the Lebanese University and the chair (non-profit position) of the scientific committee at the Lebanese Order of Pharmacists. All three authors contributed to in the analysis and interpretation of data. We have no other conflict of interest to declare.

We also declare that the study was conducted in two Lebanese non-teaching hospitals. Acknowledgments: We thank the pharmacy students and residents for their contribution in interviewing the patients.

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