

## Original Research Article

# Knowledge, attitude, practice and satisfaction of patients using analgesic patches in Jordan

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### Abstract

**Purpose:** To investigate the knowledge, attitude, practice (KAP) and satisfaction of Jordanian patients using analgesic patches.

**Methods:** This cross-sectional descriptive study was conducted in four urban centers in Jordan (Amman (capital), Irbid (northern Jordan), Zarqa (central Jordan), and Karak (southern of Jordan)) using a validated closed and open-ended questionnaire. The questionnaire was delivered by hand to a target sample of 250 patients.

**Results:** A total of 178 patients were recruited with a response rate of 71.2 %. Only 40 % of patients had previously been prescribed or recommended to take analgesic patches by a physician or pharmacist. The overall proportion of patients who were aware of the correct use of patch was only of 31 %.

**Conclusion:** The use of patches in Jordan is limited due to lack of patients' knowledge about the proper use of patches. Further studies should be carried out to evaluate healthcare providers' perceptions and knowledge towards the use of patches.

**Keywords:** Attitude, Practice, Counseling, Analgesic, Patch

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## INTRODUCTION

Optimal drug dosing with minimal frequency is the main target in treating acute and chronic diseases. Several dosage forms have been developed to achieve this goal. Topical and transdermal drug delivery systems, mainly skin patches, are becoming a promising route of administration for many reasons. Namely, patches improve the drug's performance in

terms of efficacy and safety, they are suitable for patients who are unconscious or nil per os (NPO), and can be self-administered which improves patient compliance [1,2]. In addition, the ease of application and convenient access due to a large surface area of skin allow many placement options [3,4]. Moreover, patches are simple, easy to use and painless compared to parenteral, where injections are unpleasant, painful, generate dangerous medical waste, and

may transmit infectious diseases by needle re-use, especially in developing countries [1-3]. There is also the advantage of terminating drug administration by patch removal.

In Jordan, the general usage of skin patch containing medications is limited. The most commonly used patches are those loaded with analgesics for back pain and muscle spasm. The under-estimation of beneficial use of skin patches is subjected to several factors that should be investigated from the physicians, pharmacists and patients' point of view. Exploring physicians, pharmacists and patients' opinions on all aspects of skin patches is crucial to improve the clinical outcomes and to evaluate the limitations of their usage in Jordan. Thus, the aim of this study is to investigate the knowledge, attitude, practice (KAP) and satisfaction of Jordanian patients regarding the use of analgesic patches. To the best of our knowledge, no studies have been conducted to date exploring these parameters using analgesic patches in either Jordan or the Middle East. This study aims to address this gap in the literature.

## EXPERIMENTAL

### Study design

A cross sectional, descriptive study was done, as it could measure the patients' KAP regarding the use of analgesic patches. A total of 250 participants who attended the pharmacy in four urban centers in Jordan; (Amman, (capital city), Irbid (northern Jordan), Zarqa (central Jordan), and Karak (southern Jordan)), were chosen for the study by convenient sampling.

These areas have great variation in population's annual income, education, and health care services; thereby encountering a wide cross-section of the community. Patients' recruitment was conducted during weekdays and weekends over a period of eight months (January to August) in 2017.

A closed and open-ended questionnaire was used to explore Jordanian patients' KAP and satisfaction towards the use of analgesic patches, effects and side effects. The research assistants were asked to visit different areas on different days to deliver the questionnaire to pharmacists working in pharmacies who would give it to eligible patients.

A convenient non-random sampling approach was used to select patients older than 18-years and used patches containing analgesics for medical purposes at least one time. Patients

were informed about the purpose of the study and were invited to fill the questionnaire. Informed consent to participate in the study was obtained based on a standard written statement. All data were obtained under confidentiality. No details related to the identity of the patients were recorded. The study protocol was approved by the Ethics Committee at Zarqa University (approval no. 016/01/2) and followed the guidelines of Declaration of Helsinki and Good Clinical Practices [5].

### Study tools

This study adopted a survey methodology using a self-completed validated questionnaire. To prepare the questionnaire, a comprehensive literature review was conducted to ensure readability and content validity of the questions. Every effort was made during literature review to ensure content validity. Moreover, various drafts of the questionnaire were evaluated individually by two clinical pharmacists, two statisticians and one sociologist in order to ensure face validity. The study was piloted on 30 educated and non-educated patients before the start of the study. As a result, a few questions were added/deleted. None of this pilot data was included in the final analysis.

This representative comprehensive study was conducted among four urban regions in Jordan (Amman (Capital), Irbid (north of Jordan), Zarqa (middle of Jordan), and Karak (south of Jordan)) which aimed to screen the usage of analgesic skin patches, assess the knowledge and awareness of the appropriate application of patches, detect the most occurring adverse effects experienced by the patients, and evaluate the possible pharmacists' role in selecting suitable analgesic patches and counseling patients.

The study questionnaire was conducted in Arabic and consisted of three parts: The first part was planned to collect patient demographic data including age, gender, education level, occupation, and medical affiliation (physician, pharmacist or nurse). The second part was designed to assess patient's medical conditions and any analgesic drugs used (including the drug name, dosage form, route of administration, the frequency and the duration of use) other than analgesic patches. The third part evaluated patients' KAP and satisfaction towards the use of analgesic patches. This included effects/side effects, pain type/ severity, person who prescribed the patch, patient counseling, what are the sources of information they need about analgesic patch, pain response after patch

application and patch disposition after usage. KAP and satisfaction of patients towards using skin patches was assessed using a 5-point Likert scale questionnaire (strongly agree, agree, neutral, disagree, and strongly disagree).

### Outcomes measurement

This study measured the percentage of patients who believed that the analgesic patch use has benefits, and the percentage of these who also believed that analgesic patch use has side effects. Moreover, the percentage of participants who often pursued any information about analgesic patch use, effect and side effects from different sources was assessed.

### Statistical analysis

All collected data were coded, entered, and analyzed using the SPSS<sup>®</sup> software (version 24.0) database for statistical analysis. Continuous descriptive statistics were constructed as mean  $\pm$  standard deviation (SD). Differences between the various groups were evaluated using the Chi-square test and Fisher exact test for categorical variables. All tests of significance were set at  $p \leq 0.05$ .

## RESULTS

### Demographics and patient characteristics

The questionnaire was delivered by hand to a target sample of 250 patients, one hundred and seventy-eight participants 18 years or older completed the questionnaires with a response rate of 71.2%. Ninety-two (51.7%) of the participants were female. The age ranged between 18 and 77 years. The mean age was 37.3 (SD  $\pm$  13.4) years with different education levels. Table 1 shows the demographic details of the recruited patients. More than two-thirds of patients did not have chronic diseases, while 10.1% of them were hypertensive, 9.6% were diabetic and 4.5% of them had dyslipidemia.

As shown in Table 2, more than half of patients used other dosage forms of analgesics such as oral drugs (90.6%) or topical drugs (9.4%) beside their patch use. Around 37.0% of patients used oral analgesics for pain management such as paracetamol (37.6%) and NSAIDs (29.8%). Oral analgesic agents were mainly used for back/shoulder/neck/knee pain (70.8%), headache pain (15.7%) and muscle spasm pain (3.9%). Other treatments such as anxiolytics, sedatives, and hypnotics, which include benzodiazepines, were not reported among the respondents. Thirty-three (18.5%) patients used

more than one analgesic in addition to their patch use. Most of those patients were in the age group of 18 to 50 years. There was no significant difference between chronic morbidity and the use of other analgesics concomitantly with analgesic patches use ( $p > 0.05$ ).

**Table 1:** Demographic details of patients who responded to the questionnaire, (N=178\*)

Parameter	N
<b>Age group in years, N (%)</b>	
18-30	76 (42.7%)
31-50	73 (41.0%)
50-70	25 (14.0%)
> 71	4 (2.2%)
<b>Gender, N (%)</b>	
Male	86 (48.3%)
Female	92 (51.7%)
<b>Education level, N (%)</b>	
Illiterate	22 (12.4%)
High school	41 (23.0%)
2 years Diploma degree	29 (16.3%)
Bachelor degree	78 (43.8%)
Post graduate university degree	8 (4.5%)
<b>Professional affiliation, N (%)</b>	
Yes (medicine, pharmacy, nursing and others)	17 (9.6%)
No	161 (90.4%)

\*Some data are missing, and so the total may not add up to 178

### Analgesic patches' prescriptions

Only 40 % of patients were prescribed or recommended to take analgesic patches by the physician or the pharmacist. Although patient counseling is considered as an essential component of pharmaceutical care services, only 55 (30.9%) patients received counseling concerning their analgesic patch use; thirty-seven patients (20.8%) were counseled by a community pharmacist and/or physician and 18 (10.1%) patients received directions from family member, a friend, media or internet access. Table 3 summarizes the details about pain management using different analgesic patches. The majority of young patients (18-50 years) did not use the patch after prescription by a physician or pharmacist ( $p < 0.001$ ) neither did they seek counseling advice from the physician or pharmacist about the proper use of the analgesic patches ( $p = 0.025$ ), instead they got an advice from a family member, friend or even from Facebook or the internet. On the other hand, older patients (>50 years) prefer to ask their physician/pharmacist about the instructions of use before using the patch.

According to the pain description, there appeared to be a variation in the nature of pain; most patients indicated that their pain was acute 113

**Table 2:** Medical conditions and pain characteristics of the patients, (N = 178\*)

<b>Parameter</b>	
<b>Presence of chronic disease, N (%)</b>	
None	111 (62.4%)
Diabetes	17 (9.6%)
Hypertension	18 (10.2%)
Dyslipidemia	8 (4.5%)
Obesity (BMI >30kg/m <sup>2</sup> )	18 (10.2%)
Others (respiratory, rheumatology, renal...etc)	6 (3.4%)
<b>Use of oral analgesic for pain management, N (%)</b>	
Yes	66 (37.1%)
No	112 (62.9%)
<b>Oral Analgesic used for pain management, N (%)</b>	
Paracetamol	67 (37.6%)
Non-Steroidal Anti-inflammatory drugs (diclofenac, naproxen, ibuprofen and mefenamic acid)	53 (29.8%)
Others (e.g., etoricoxib, eperisone, etc)	9 (5.1%)
<b>Source of pain, N (%)</b>	
Back/neck/shoulder/knee pain	126 (70.8%)
Headache	28 (15.7%)
Muscle spasm and pain	7 (3.9%)
Others (e.g. menstruation pain, joint pain, etc.)	17 (9.6%)

\*Some data are missing, and so the total may not add up to 178

**Table 3:** Pain management with analgesic patches, (N=178\*)

<b>Parameter</b>	<b>N</b>
<b>Pain type/intensity, N (%)</b>	
Acute Pain	113 (63.5%)
Mild	19 (16.8%)
Moderate	79 (69.9%)
Severe	15 (13.3%)
Chronic Pain (> 3 months in duration)	65 (36.5%)
Mild	5 (7.7%)
Moderate	38 (58.5%)
Severe	22 (33.8%)
<b>Prescriber of patch to patient, N (%)</b>	
Physician/Pharmacist	71 (39.9%)
Others (friend, family, personal diligence, media and internet)	107 (60.1%)
<b>Received counseling/advice, N (%)</b>	
Yes	55 (30.9%)
Physician/Pharmacist	37 (20.8%)
Others (friend, family, media and internet)	18 (10.1%)
No	123 (69.1%)

\*Some data are missing, and so the total may not add up to 178

(63.5%), compared to 65 patients (36.5%) with chronic pain. Pain-relieving patches were used for providing temporary relief for mild 24 (13.5%), moderate 117 (65.7%), and severe 37 (20.8%) pain, as shown in Table 3.

### Types of the analgesic patches

As shown in Table 4, different types of analgesic patches were used by the participants. The majority of participants used capsaicin containing patches (82.8%) and the remaining used heat therapy patches (7.3%), cold therapy patches (2.2%), diclofenac containing patches (2.8%) or fentanyl containing patches (1.1%). The most frequently used patches (capsaicin and heat therapy patches) were used mainly for moderate

acute pain ( $p = 0.016$ ) over mild chronic pain type.

Patients used analgesics primarily to treat back pain 139 (78.1%) but also shoulder/neck pain (13.5%), knee pain (5.1%) or others. Mainly, patients used analgesic patches for pain management as needed (PRN) (76.4%) compared to only 17.0% of patients who used them as scheduled. There was a significant difference ( $p = 0.003$ ) between the frequency of using analgesic patches and the presence of chronic diseases. Regarding the duration of patch application on the skin. Only 12.4% of patients applied it for 1-4 h, 26.4% of patients applied it for 5-12 h, 43.8% of patients applied it for 12-24 h, and 17.4% of patients applied it for more than 24 h. No significant difference was found between duration of patch application with the type of pain (acute or chronic) or the outcome (reduction or disappearance of pain ( $p > 0.05$ )).

When pain intensity was assessed, the majority of patients (74.7%) indicated a reduction in the intensity of pain when they placed the patches on their affected areas, while others indicated complete pain disappearance (25.3%). Pain management time analysis showed that it was reduced within few hours in 44.9% of patients or within 30 to 60 min in 34.8% of patients, while only 3.9 % of patients reported that it took them more than one day for pain relief. Table 5 shows the results regarding patients' opinions and practices toward pain intensity and response and how to get rid of the analgesic patch after use.

### Patients' KAP and satisfaction

We assessed the knowledge of patients on how

**Table 4:** General characteristics of analgesic patches used by the patients, (N=178\*)

Parameter	N
<b>Analgesic patch type, N (%)</b>	
Capsicum Containing Patches (Johnson <sup>®</sup> , Salonpas <sup>®</sup> )	147 (82.8%)
Heat Therapy Patches (Thermacare <sup>®</sup> , DeepHeat <sup>®</sup> )	13 (7.3%)
Cold Therapy Patches (BioFreeze <sup>®</sup> , DeepFreeze <sup>®</sup> )	4 (2.2%)
Diclofenac Containing Patches (Valtarol <sup>®</sup> )	5 (2.8%)
Fentanyl Containing Patches (Durogesic <sup>®</sup> )	2 (1.1%)
<b>Frequency of use of analgesic patch for pain, N (%)</b>	
PRN (as needed)	136 (76.4%)
Scheduled	30 (16.9%)
<b>Duration of analgesic patch use, N (%)</b>	
1-4 h	22 (12.4%)
5-12 h	47 (26.4%)
12-24 h	78 (43.8%)
> 24 h	31 (17.4%)
<b>Application site, N (%)</b>	
Back	139 (78.1%)
Shoulder/Neck	24 (13.5%)
Knee	9 (5.1%)
Others (joint, head...etc.)	6 (3.4%)

\*Some data are missing, and so the total may not add up to 178

**Table 5:** Patients opinions and practices about pain response and how to get rid of the analgesic patch after use, (N = 178\*)

Parameter	N
<b>Analgesic patch type, N (%)</b>	
Capsicum Containing Patches (Johnson <sup>®</sup> , Salonpas <sup>®</sup> )	147 (82.8%)
Heat Therapy Patches (Thermacare <sup>®</sup> , DeepHeat <sup>®</sup> )	13 (7.3%)
Cold Therapy Patches (BioFreeze <sup>®</sup> , DeepFreeze <sup>®</sup> )	4 (2.2%)
Diclofenac Containing Patches (Valtarol <sup>®</sup> )	5 (2.8%)
Fentanyl Containing Patches (Durogesic <sup>®</sup> )	2 (1.1%)
<b>Frequency of use of analgesic patch for pain, N (%)</b>	
PRN (as needed)	136 (76.4%)
Scheduled	30 (16.9%)
<b>Duration of analgesic patch use, N (%)</b>	
1-4 h	22 (12.4%)
5-12 h	47 (26.4%)
12-24 h	78 (43.8%)
> 24 h	31 (17.4%)
<b>Application site, N (%)</b>	
Back	139 (78.1%)
Shoulder/Neck	24 (13.5%)
Knee	9 (5.1%)
Others (joint, head...etc.)	6 (3.4%)

\*Some data are missing, and so the total may not add up to 178

to use patches. Data shows that before patch application, a small number of patients 56 (31.5%) wash their hands, clean the site of application with water, and check its dryness. However, 18 patients (10.1%) only wash their hands and check area dryness without cleaning it. Two patients (1.1%) apply the patch on a hairy area, and only 2 patients (1.1%) check the area before patch application if there are any skin cracks.

As shown in Table 5 and regarding patient's knowledge and attitude on disposal of used patch, we found that all patients 178 (100%) discarded their used patch in a recycle bin.

Thirty-one (17.4%) patients fold the patch in half before disposal and 39 (21.9%) patients wrap the patch with its original bag. In addition, only 22 (12.6%) patients make sure to keep the used patch out of reach of children after disposal and no one burned the patch. Neither age gender nor the educational level of patients significantly influenced the patients' knowledge or practice of using patches ( $p > 0.05$ ), except the medically affiliated patients who were significantly more aware of the proper way to discard the patch ( $p = 0.035$ ).

Table 6 shows the percentage of distribution of responses of patients' attitudes, practices and

**Table 6:** Patients' opinions, attitude and practices and satisfaction regarding use, effects and side effects of the used analgesic patches, (N = 178\*)

Parameter	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
	N (%)	N (%)	N (%)	N (%)	N (%)
<i>Patch is easily used</i>	44 (24.7%)	121 (68.0%)	7 (3.9%)	6 (3.4%)	0 (0.0%)
<i>Patch is easily removed</i>	8 (4.5%)	107 (60.1%)	21 (11.8%)	37 (20.8%)	5 (2.8%)
<i>Good skin adhesion</i>	24 (13.5%)	119 (66.9%)	16 (9.0%)	19 (10.7%)	0 (0.0%)
<i>Itching after patch application</i>	14 (7.9%)	118 (66.3%)	24 (13.5%)	21 (11.8%)	1 (0.6%)
<i>Redness/irritation after using the patch</i>	12 (6.7%)	99 (55.6%)	36 (20.2%)	30 (16.9%)	1 (0.6%)
<i>Patch adverse effects are tolerable</i>	7 (3.9%)	102 (57.3%)	21 (11.8%)	38 (21.3%)	10 (5.6%)
<i>A sticky residue is left after I remove the patch</i>	17 (9.6%)	125 (70.2%)	21(11.8%)	14 (7.9%)	1 (0.6%)
<i>I am satisfied with using the patch</i>	14 (7.9%)	112 (62.9%)	38 (21.3%)	14 (7.9%)	0 (0.0%)

\*Some data are missing, and so the total may not add up to 178

satisfaction toward the use of analgesic patches. Regarding the easiness of patch use, the patients generally had a positive attitude toward using patches since the majority (92.7%) answered strongly agree or agree to the question stating that the patch was easy to use. But when asked about the ease of patch removal, the number decreased; in particular, 64.6% of patients strongly agreed or agreed in the fact that the patch is easily removed and around one third of them experienced difficulty in patch removal. Local adverse effects such as itching, redness/irritation and sticky residue left after removal were experienced by most patients (74.2, 62.3 and 79.8 %; respectively). The higher incidence rate of skin irritations was reported in patients applying the patch between 12 and 24 h/day. A significant relation was found between skin itching ( $p = 0.003$ ), redness/irritation ( $p < 0.001$ ) or sticky residue left after removal ( $p = 0.017$ ) and duration of applying the patch.

However, in general, most of the patients (61.2%) believe that patch adverse effects are tolerable and overall most of patients (70.8%) were also satisfied with using patches.

## DISCUSSION

To our knowledge, this is the first observational, prospective, multicenter study that describes KAP and satisfaction of patients using analgesic patches in Jordan. Since the study sites were well distributed throughout Jordan, these findings are likely to be representative of Jordan's population.

Our study reveals that most of the Jordanian patients receiving analgesic patches experienced acute back pain of moderate-to-severe intensity. In addition, the patches were effective in pain relief and reducing the intensity of pain. The same results were found by Grahame group who

evaluated the efficacy of the non-steroidal anti-inflammatory drugs (NSAIDs) patch containing flurbiprofen compared with a placebo patch in the treatment of soft-tissue rheumatism [6]. Improvement in pain relief and clinical condition was shown to be greater when using the flurbiprofen patch compared to the use of the placebo patch. Also, the treatment with flurbiprofen patch was found to be superior to oral diclofenac in terms of both efficacy and gastrointestinal tolerability [6]. These findings assert that the patches provide an effective and convenient mode of treatment.

In addition, our study shows that the majority of patients using analgesic patches were also receiving concomitant oral analgesic medications such as paracetamol and diclofenac sodium. This reflects that many patients may be unaware of the potential toxicity and adverse drug interactions associated with concomitant analgesic medications. Therefore, patients should be properly counseled on the appropriate and safe use of different dosage forms which can help minimize adverse effects and ensure positive clinical outcomes.

The majority of patients believe that it took a few hours to have their pain intensity reduced. This study showed that the patients generally had a positive attitude toward using patches since the majority agreed that the patch is easily used.

In our study, patients believed that sticky residue after removal and skin itching were the most frequently reported adverse reaction with the analgesic patch, followed by skin redness/irritation. The same result was found in different studies [5,7-9]. Skin irritation at the treatment site was the most frequently reported adverse effect in patients using transdermal buprenorphine and flurbiprofen patches [5,7-9]. Skin irritations reported in our study were generally mild or moderate in severity and were

restricted to the application site. Over 60 % of patients managed to tolerate the adverse effects of patches. This suggests that the patches are well tolerated and offer an attractive analgesic alternative for patients.

Patches counseling should imply the discussion of where to place the patch, how long to wear it for and when to remove or replace it [10]. The patient should determine the site for patch application based on physician's or pharmacist's instructions. Once identified, the patch should be applied after removing the protective liner as directed by the instructions. It is important to use the patch correctly to decrease side effects and improve clinical outcomes.

In this study, the proportion of patients who were aware of the correct use of patch was only of 31%. The present study reports the lack of counseling by pharmacists to patients regarding the correct use of the patches. Only 30.9% of the participating patients received counseling on their patch use. Several studies highlighted errors in the application of transdermal patches [11-13]. In a Hungarian survey aimed to explore the patients' errors in the application of medical patches in community pharmacies, results showed that although the manufacturer's leaflet was useful for the majority of patients, verbal assistance was also important [14].

The findings of the present study suggest the majority of young patients did not seek counseling advice from the physician or pharmacist about the proper use of the analgesic patches ( $p = 0.025$ ), but rather they received it from a family member, friend or internet. On the other hand, older patients (> 50 years) prefer to ask their physician/pharmacist about the instructions before using the patch since older patients may be suffering from multiple chronic diseases, and may therefore be afraid of side effects. Moreover, young patients use smartphones more than them and have fast access to the internet which plays a role in getting information about the proper use of the analgesic patches [15-17]. Several studies explored the potentialities of mobile phones in clinical care and evaluate the benefits and the efficacy of the introduction of the mobile phone in patient counseling [15-17].

The pharmacist's role in counseling patients on the proper use of patches is highly needed. Several studies have addressed the importance of counseling to promote an informed choice, leading to better compliance [13,18-21]. The communication style and the quality of counseling are important in selecting a particular

dosage form such as patches for patients [19,22-24].

At the end of the study, most of patients reported being satisfied or very satisfied with the use of the patch. Thus, lack of patients' knowledge about the proper use of patches [10,25], pharmacy-related education to patients and dosage form preferences in patients, could partially explain the limited use of patches in Jordan. Study carried out in the Alyami group showed that solid dosage forms are the preferred dosage forms and tablets are a preferred dosage form for children and young adults [25]. Knowledge of pharmacist and physician perceptions of medical patches may explain the limitations of use patches among Jordanians. Pharmacist and physician education can improve knowledge on correct patch administration. However, the study demonstrated the need for further efforts to improve both healthcare team and patients' awareness on all aspects of medical patches.

### Limitations of the study

The main limitation of this cross-sectional study is the use of a convenient non-random sampling approach. Although the questionnaire assessed KAP and satisfaction of using skin analgesic patches among patients, but this study does not provide a complete picture of the reasons for the limited use of skin patches over other dosage forms. Therefore, further consideration should be given to study the healthcare providers' KAP towards the use of patches. Finally, increasing the sample size would also lead to more comprehensive findings.

## CONCLUSION

In Jordan, the general use of patch containing medications is limited. Lack of patients' knowledge on the proper use of patches could partially explain the limited use of patches in Jordan. This study reports the need for further studies to improve both the healthcare team's and patients' awareness of all aspects of patches. Increasing health care providers' knowledge of apprehensions related to the use of patches may lead to an increase in their use over other alternative dosage forms.

## DECLARATIONS

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## Conflict of interest

No conflict of interest is associated with this work.

## Contribution of authors

We declare that this work was done by the authors named in this article and all liabilities pertaining to claims relating to the content of this article will be borne by the authors.

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