

The Practice of Shared Decision-Making Among Physiotherapists and Patients with Musculoskeletal Conditions

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Purpose: Shared decision-making (SDM) may be interpreted as a set of core values rather than as a consensus definition. This study aimed to explore how SDM between patients and physiotherapists may lead to patient satisfaction.

Patients and Methods: A cross-sectional study was conducted to examine the relationship between SDM and patient satisfaction. The study targeted physiotherapists and patients with musculoskeletal pain or disorders. A structured questionnaire (the nine-item Shared Decision-Making Questionnaire) was developed to show the extent to which patients felt involved in the process by scoring nine items from 0 to 5 on a six-point scale. *t*-tests were performed to estimate differences in SDM perceptions between patients and physiotherapists, and regression analyses were performed to estimate the best predictors of SDM.

Results: The questionnaire was completed by a total of 106 patients and nine physiotherapists. The demographic information of the samples was presented with frequency analysis. This study's findings demonstrate no variations in the final SDM perceptions between patients and physiotherapists, but when SDM was contrasted step-by-step (as items), many variances were discovered. These distinctions reinforce the notion that regardless of the end outcome, the process of reaching a consensus has a distinct profile depending on the type of medical care. Therapists emphasize the first steps, possibly because there is sufficient evidence to make a therapeutic decision. However, patients highlight the final steps, perhaps because the moment for a decision based on the consultation's nature is approaching.

Conclusion: This study demonstrates that SDM is a complex process that must be examined in multiple stages. However, in physiotherapy contexts, this process exhibits extremely different patterns, reflecting a significantly different perspective of the decision-making process.

Keywords: physical therapy, decision-making, patient preference, musculoskeletal disorders

Introduction

The discipline of physiotherapy derives considerable satisfaction from its recognition as an evidence-based profession.¹ Therefore, it is possible to implement study findings via a technique known as shared decision-making (SDM),² which also makes it easier to provide patient-centered care by encouraging patients to take an active role in the decision-making process.³ SDM is a collaborative process that involves patients, physiotherapists, and clinicians making decisions regarding the patient's health after discussing the available options; identifying the benefits and demerits of each option; and considering the patient's values, preferences, and personal circumstances.⁴ It is also known as patient-centered decision-making or patient-centered SDM.⁵ SDM enables doctors to utilize evidence-based information while simultaneously positioning the patient (and family members, where applicable) at the center of clinical decision-making. Therefore, a collaborative choice considers the most recent and relevant research information, as well as the physiotherapist's knowledge, experience, and competence, and the patient's values and preferences.⁶ Open communication between

the patient and the therapist is essential to the SDM process. The clinician provides evidence-based information about the options and balanced information about each option's benefits, harms, and uncertainties (including watchful waiting where appropriate).⁷ Despite the growing importance of SDM in physiotherapy, there remains a need to explore how SDM between patients and physiotherapists influences patient satisfaction and treatment outcomes. Furthermore, many patients do not participate in the decision-making process. This can lead to a number of problems, including patients not being satisfied with their treatment choices, not being aware of the risks and benefits of different treatment options, and not being able to make informed decisions about their care.

Clinicians use their communication skills to actively listen to and engage with patients to elicit their preferences, advise them in accordance with their preferences, and address their concerns. The patients are aware of their disease and how it impacts their daily life, their expectations and anxieties, and their values and preferences for the available alternatives, which may be affected by their prior experiences, those of their friends, or their current circumstances (such as cost and treatment burden).⁷ Both the physician's and patient's perspectives are necessary, and combining them may lead to increased levels of satisfaction with treatment for both the therapist and the patient.⁸ However, most complaints about healthcare are caused by ineffective communication or by patients obtaining insufficient information to enable them to make decisions based on that knowledge.

Patients' expectations and ideas regarding interventions, including how they can help and to what extent, may be better managed with the assistance of SDM.⁹ Additionally, many doctors and patients have ideas about the effectiveness of interventions based on "mechanistic thinking" (that is, how the intervention ought to operate) rather than empirical thinking.¹⁰ For instance, many patients' requests for imaging for back pain are based on the notion that the physician has to "see the issue to know how to treat it". Although imaging is not frequently advised for lower back pain, many patients still request such procedures. However, via SDM, patients can be provided with more realistic expectations of their alternatives' advantages and risks.

Furthermore, the management of SDM is defined by numerous elements, one of which is enhanced patient knowledge, which clarifies patient information and allows participation in decision-making. Second, physiotherapists respect patients' goals and are eager to include them in treatment. Finally, the patient is motivated to acquire independence and self-reliance.^{11–13} However, numerous obstacles to participation in decision-making exist.¹⁴ Additionally, insufficient access to patients exists for their participation in decision-making.¹⁵

Musculoskeletal (MSK) discomfort is regarded as a leading cause of pain and disability.^{16–18} The physiotherapist and patient discuss the facts, reasons for pain, and treatment decisions.^{2,7} Nevertheless, some patients are dissatisfied with this method, even if it is beneficial, since they do not participate in the decision-making process.^{19,20} This results in a lack of trust in the physiotherapists, and patients may not have faith in their possible treatments in the future. Moreover, only a few studies have reported on SDM, where all the stakeholders were onboarded to develop appropriate treatment plans for patients. Therefore, this study aimed to explore how SDM between patients and physiotherapists may lead to patient satisfaction.

Materials and Methods

Study Design

A cross-sectional study was conducted to examine the relationship between SDM and patient satisfaction. The study complies with the Declaration of Helsinki.

Study Area and Population

This study was conducted in the city of Hail, Kingdom of Saudi Arabia, in multiple centers for physiotherapy and targeted convenience sample physiotherapists and patients with MSK pain or disorders.

The sample size determination followed the COSMIN guideline, which specifies that the number of participants should be a minimum of seven times the number of items in the questionnaire.²¹

Inclusion Criteria

Patients were included in this study if they were adults, had MSK pain, and could read and write.

Exclusion Criteria

Patients with non-MSK injuries and those aged <18 years were excluded.

Outcome Measures and Data Collection

The main outcome measure of SDM is a nine-item Shared Decision-Making Questionnaire designed in German and translated into Arabic.^{22,23} The questionnaire was developed to show the extent to which patients felt involved in the SDM process during treatment for MSK pain. The questionnaire was scored by summing the nine items from 0 to 5 on a six-point Likert scale; the scale ranged from “completely disagree” (0) to “completely agree” (5). The summation of all items led to a raw total score between 0 and 45. Additionally, the multiplication of the raw score by 20/9 gave a forced (transformed) score ranging from 0 to 100, where 0 and 100 indicated the lowest and highest extent of SDM, respectively. The authors encouraged the use of the transformed score because it was more intuitively interpretable.

A physiotherapist was appointed to diagnose the cases, and after identifying the targeted cases, the therapist mentioned the cases to the designated receptionist. The receptionist completed two anonymous questionnaires with matching codes as follows: one each for the physiotherapist and the patient. Tokens enabled the researchers to match the responses from the same consultation. Immediately after the consultation, the patients and physiotherapists completed their questionnaires separately and returned them to the receptionist. The patients were required to return anonymous surveys to the receptionist either by handing them over or leaving them in a locked box. The receptionist kept the completed forms in closed boxes until the researcher collected them. The confidentiality of the participants was ensured to meet research ethics.

Data were collected by members of the research team who had undergone training on the study protocol, including research ethics. The questionnaire consisted of nine questions that dealt with the necessity of making a decision, the desire to make a decision, and the multiplicity of treatment methods; regarding how to proceed with the case, the answer alternatives were “exactly correct”, “largely correct”, “somewhat correct”, “somewhat incorrect”, “largely incorrect”, and “not quite correct”.

Subsequently, the questionnaire was coded in the SPSS program as numbers where exactly true, to a large extent true, true to some extent, incorrect to some extent, incorrect to a large extent, and not completely correct were equivalent to 1, 2, 3, 4, 5, and 6, respectively. Finally, the ratio was calculated using the program, and the bias factor was 0.5.

Statistical Analysis

The demographic information of the samples was reported using frequency analysis. Additionally, *t*-tests were performed to estimate differences in SDM perceptions (item-by-item and total score) between patients and physiotherapists. The effect sizes were calculated using Cohen's statistics. Furthermore, to analyze the orientation of item-by-item scores, direct scores were transformed into two categories as follows: “disagree” (responses from 1 to 3) and “agree” (responses from 4 to 6). *t*-tests were performed to estimate the differences between the two categories. Finally, regression analyses were performed to estimate the best predictors of SDM, the total score, and item-by-item scores. A step-by-step model was used to identify only those variables that played a relevant role in predicting SDM scores. This model introduced only variables with a significant contribution to the equation.

Results

Samples Characteristics

Table 1 shows the sample distribution by age, sex, job, and diagnosis. Overall, 106 patients participated in this study; 64.2% and 35.8% were males and females, respectively. The patients' ages ranged from 18 to 77 years, with a mean age of 39.06±13.68. Most patients were students (17%), followed by the unemployed (16%) and housewives (14.2%). The

Table I Sample Characteristics

	Patients (N=106)	Physiotherapists (N=9)
Age		
Mean age \pmSD	39.06 \pm 13.68	
Rank	18–77 years	
Gender		
Male	64.2%	66.7%
Female	35.8%	33.3%
Job	Student: 17.0% Unemployed: 16.0% Housewife: 14.2% Office Work: 11.3% Teacher: 10.4% Others: 31.1%	Physiotherapist: 100%
Diagnosis	Low Back Pain: 26.4% Neck Pain: 10.4% Knee OA: 10.4% Shoulder Pain: 9.4% Ankle Sprain: 7.5% Multiple MSK Conditions: 35.9%	
The decision		6 sessions: 37.7% 10 sessions: 12.3% 15 sessions: 20.8% 20 sessions: 15.1% 40 sessions: 13.2% 60 sessions: 0.9%

Abbreviations: MSK, Musculoskeletal; OA, osteoarthritis; SD, standard deviation.

diagnoses varied between low back pain (26.4%), neck pain (10.4%), knee osteoarthritis (10.4%), shoulder pain (9.4%), ankle sprain (7.5%), and multiple MSK conditions (35.9%).

According to physiotherapists, 66.7% and 33.3% were males and females, respectively. All patients had specialized physiotherapists. The physiotherapists made different patient treatment decisions, ranging across six and 60 sessions; the most and least frequent treatment decisions involved six (37.7%) and 60 (0.9%) sessions, respectively.

Descriptive Analyses of the Nine-Item Shared Decision-Making Questionnaire (SDM-Q-9) Items

An initial analysis was performed to compare the total SDM-Q-9 scores between patients and physiotherapists. Student's *t*-test for the total score (0–100 transformed) showed no statistically significant differences between them (patients: 62.3 \pm 20.8; physiotherapists: 63.3 \pm 18.6; *t* [1109] = −0.7). Since no statistically significant differences were found, new *t*-tests were performed, considering the different items (representing different contents/steps in SDM). Table 2 summarizes the obtained data.

Although no change was found in the total score, certain categories showed statistically significant differences between the two groups. However, item 8 was the exception, and its lack of variance was consistent with the total score's lack of differences because the item's content refers to the final physiotherapists' shared decision. The observed pattern of differences showed that the physiotherapists' score was greater in the beginning items (when the professionals notify their patients about the need to make a decision and how patients are ready to participate). Patients scored higher on intermediate elements (options, patient preferences, and bargaining, among others). The physiotherapists scored better on the final item (follow-up).

Table 2 Mean Differences Between Patients and Physiotherapists for the Different Steps in the SDM Process, According to the SDM-Q-9 Items

Shared Decision-Making Process Steps Corresponding to the SDM-Q-9 Items	Patients (N=106)		Physiotherapists (N=9)		z	P	d
	M	SD	M	SD			
The disclosure that a decision needs to be made	5.21	1.22	5.43	1.07	-0.447	0.000	0.59
Formulation of the equality of partners	5.02	1.34	4.94	1.31	-1.342	0.001	0.74
Equipoise statement	4.77	1.25	4.50	1.18	-0.577	0.000	0.47
Information on the options' benefits and risks	5.00	1.09	5.36	0.843	-0.934	0.000	0.41
Investigation of a patient's understanding and expectations	5.63	0.77	5.80	0.524	-4.314	0.015	0.19
Identification of preferences	4.55	1.30	4.03	1.29	-1.173	0.000	0.27
Negotiation	4.63	1.39	4.62	1.13	-0.685	0.000	0.21
Shared decision	4.32	1.77	3.92	1.61	-8.541	0.214	0.04
Arrangements of follow-up	5.52	1.85	5.76	0.56	-0.784	0.000	0.71

Abbreviations: SDM, Shared Decision-Making; SDM-Q-9, nine-item Shared Decision-Making Questionnaire; d, Cohen's statistic; M, median; P, probability; SD, standard deviation; z, z scores from the Mann-Whitney U-test.

However, greater impacts were found when physiotherapists scored higher (particularly in the “formulation of equality of partners”), ranging from medium to high effect coefficients. Furthermore, item 5 (patient anticipation) was not statistically significant.

A second analysis was performed to identify the orientation of such differences, which implies the level of agreement between both groups of patients and physiotherapists with the various components of SDM. As previously stated, each item was categorized into two categories as follows: “disagree” (responses ranging from 1 to 3) and “agree” (responses ranging from 4 to 6). (Responses 4 to 6). Data were converted to percentages to facilitate comprehension. Table 3 summarizes the obtained data.

Although the transformed questionnaire scores in both samples were nearly identical (patients: 62.3 ± 20.8 ; physiotherapists: 63.3 ± 18.6), the results obtained item by item were similar, indicating a similar perspective of the decision-

Table 3 Percentage Agreement with SDM-Q-9 Contents in Patients and Physiotherapists

Shared Decision-Making Process Steps Corresponding to the SDM-Q-9 Items	Patients (N=106)		Physiotherapists (N=9)	
	Disagree	Agree	Disagree	Agree
The disclosure that a decision needs to be made	9.4	90.6	8.5	91.5
Formulation of the equality of partners	16.1	83.9	13.2	86.8
Equipoise statement	11.3	88.7	18.9	81.1
Information on the options' benefits and risks	8.5	91.5	2.8	97.2
Investigation of a patient's understanding and expectations	1.9	98.1	0	100
Identification of preferences	21.7	78.3	33.0	67.0
Negotiation	19.8	80.2	13.2	86.8
Shared decision	29.2	70.8	34.9	65.1
Arrangements of follow-up	2.8	97.2	0.9	99.1

Abbreviation: SDM-Q-9, nine-item Shared Decision-Making Questionnaire.

Table 4 Regression Analyses (Step-by-Step Model) for Content Considering Age, Job, Diagnosis and Gender as Explanatory Variables

Shared Decision-Making Process Steps Corresponding to the SDM-Q-9 Items	Variable in the Equation	B (CI)
The disclosure that a decision needs to be made	Age	-0.326 (-0.046/-0.012)
Formulation of the equality of partners	Job	0.143 (0.21/0.35)
Equipoise statement	Gender	-0.260 (-1.19/-0.16)
Information on the options' benefits and risks	Job	0.158 (-0.03/0.26)
Investigation of a patient's understanding and expectations	Gender	0.167 (-0.051/0.58)
Identification of preferences	Diagnosis	0.010 (-0.16/0.18)
Negotiation	Gender	0.091 (-0.26/0.68)
Shared decision	Diagnosis	-0.43 (-0.29/0.91)
Arrangements of follow-up	Age	0.098 (-0.006/0.018)
Total score	Job	0.44 (0.14/0.24)

Abbreviations: SDM, Shared Decision-Making; CI, confidence interval.

making process in their consultations (Table 3). Most patients agreed with every single item on the questionnaire, and most physiotherapists agreed with five items, although they scored higher. Additionally, most patients agreed with their physiotherapists' admission that a decision must be made and that their physiotherapists wanted to know how they preferred to engage in making the decision. However, for the most part, they considered that they were educated about the various options available, as well as the benefits and drawbacks of those options.

Considering the various patient and physiotherapist profiles in SDM, the following analysis sought to determine whether contextual clinical variables, such as treatment decisions (number of sessions) and sociodemographic variables (age, gender, and job), played a significant role in predicting those profiles. Several regression analyses were performed on the items as dependent variables. Contextual and sociodemographic variables and sample type (patients and physiotherapists) were introduced as explanatory variables. Table 4 summarizes the obtained coefficients.

As can be observed, "Sample type" was present in all equations (and in the first step) except for the total score. Two variables played a significant role depending on the item/content as follows: "diagnosis" contributed positively to the "Identification of preferences" item and "shared decision". "Gender" only appeared to play a role in predicting the "Equipoise statement" and "Negotiation" items. The "job" variable appears in the first and "follow-up" items. However, the overall score was only predicted (statistically significant) by "job".

Discussion

This study primarily aimed to investigate whether treatment choices were made jointly or individually by the patients and physiotherapists. The study's results suggest that the fact that the findings were comparable item-by-item implies that the parties involved in the discussions had a similar viewpoint on the decision-making process. Most patients agreed with each issue on the questionnaire, and most physiotherapists responded affirmatively to five of the questions. Additionally, most patients agreed with their physiotherapists' admission that a choice must be made. Furthermore, the patients' physiotherapists wanted to know how the patients wanted to be involved in the decision-making process. In contrast, they believed that they had a good understanding of the myriad possible choices, as well as the advantages and disadvantages of those choices. This was most of their opinion.

Moreover, it can be observed that the term "Sample type" appears in all of the equations, excluding the equation that calculates the overall score. Depending on the item or its content, two major factors exist. One of these factors is known as "diagnosis", which positively contributes to both the "Identification of preferences" item and the "shared choice" item. However, it appears that "Gender" is only relevant for forecasting the "Equilibrium statement" and the "Negotiation"

elements. Both the first and “follow-up” items include the “job” variable in some capacity, and this is the only variable that can accurately predict the total score.

Previous studies in physiotherapy healthcare settings have shown that physiotherapists have a favorable attitude toward involving patients in a procedure of reciprocal communication that considers their choices, values, and expectations, and they are more cautious about sharing decisions.^{24,25} Our results are consistent with those of many previous studies.

Our results are also compatible with the findings that some participants thought that the physiotherapist had excessive influence over their relationship. This led to a didactic and paternalistic approach, which was poorly accepted and inhibited the involvement of SDM.^{26,27} This might be because the physician views their job as that of a decision-maker and an advocate for their patients. Another study showed that physiotherapists frequently make incorrect judgments about people’s preferences for involvement in decision-making, which suggests that although therapists frequently have good intentions, they may avoid using SDM on the assumption that patients do not want to participate in the process.^{28,29} Therefore, to ensure cooperation, there must be a shift in clinicians’ attitudes and behaviors.

Patients who participated in semi-structured interviews and those whose therapists had used the tool described having more in-depth discussions about the benefits and harms of many treatment options, as well as a greater understanding of the structured progression of the treatment options as their condition progressed.³⁰ Additionally, interviews were conducted with physiotherapists before and after using the instrument. During the interviews conducted “before”, therapists voiced their concerns that the tool would increase the time of each session, that patients would be resistant to being involved in decision-making, and that there would be a risk of information overload. In the interviews conducted “after”, the therapists said that the tool had altered their typical mode of communication and that including this tool in clinical practice was usually acceptable and useful.³¹

In a pilot cluster randomized trial for low back pain involving 19 physiotherapists and 148 participants, patient satisfaction was higher in the control group (67%) than in the intervention group (53%).³² This trend occurred because the patient decision support package consisted of a patient booklet and a 2-hour training for intervention group therapists. However, as part of this pilot study, a process review, which may have explained this result, was not performed. Therefore, it was hypothesized that the decision-support package would lead to patients having less confidence in the efficacy of the many treatment alternatives that were made accessible to them, which would, in turn, lower their expectations of benefit.³³

Ethical considerations play a pivotal role in the decision-making process in physiotherapy. The professional code of ethics for physiotherapists mandates them to respect patients’ autonomy, which inherently includes involving patients in decisions about their care. This SDM process is ethically appropriate and aligns with the principles of person-centered care, fostering an environment of mutual respect and cooperation.

Furthermore, the code of ethics requires physiotherapists to provide accurate and comprehensive information to patients, which is crucial for informed decision-making. It also calls for physiotherapists to respect patients’ values and preferences, which echoes the need for active listening and consideration of patients’ preferences in the SDM process identified in our study. In light of these ethical guidelines, the barriers identified in our study—such as a lack of opportunity, confidence, and capacity on the individual’s side—represent ethical challenges that must be addressed to ensure ethical compliance in physiotherapy practice. Thus, our findings underscore the need for professional development programs for physiotherapists focusing on ethical decision-making, effective patient communication, and strategies for fostering patient participation and empowerment.

To analyze the effects of patient participation in decision-making for maintaining motivation in both clinical practice and patient care, as well as increasing its utilization, routine collection can include proximal, distal, and distant outcomes^{34,35} included in healthcare system policies, task groups, and government agencies. Both the care pathways of the United Kingdom’s National Health Service and Scotland’s Realistic Medicine policy have been updated to include patient experience and SDM.³⁶

It is necessary to make changes in the activation and preparedness of healthcare providers, patients, and the general public for collaborative decision-making to foster cultural changes at the individual clinician and patient level. Therefore, campaigns that target patients, clinicians, and the public are regarded as a critical component of many implementation

methods. These campaigns can increase the acknowledgment of the expertise that both patients and physicians bring to the consultation. The information aimed at patients and the public may focus on ways to empower individuals to take a more active role in managing their medical care.³⁷

The physiotherapist's desire to make hard decisions was motivated by a wide variety of thinking. The fear of making the "wrong" choice was mentioned, which suggests that individuals are more prone to opt out of high-risk decisions, although other participants were glad to delegate "small" decisions.³⁸ Furthermore, a person's opinion that they do not have sufficient medical expertise, particularly compared with that of a physician, might also contribute to their fear of making an incorrect choice.³⁹ This is particularly important in the field of MSK physiotherapy, where there are very few treatments that are both 100% successful and free of side effects.

According to a study's findings, decision preferences may be influenced by cultural, social, and economic variables. This phenomenon has also been observed in other healthcare settings.⁴⁰ Although these demographics are unchangeable, research has demonstrated that an individual's behavior may be altered if they are provided with appropriate choice assistance. Therefore, individuals have the capability, regardless of their history, to modify their attitudes and behaviors toward SDM if the necessary help is provided to them at the right time.⁴¹

In addition to therapists sharing power, it is necessary to increase people's capacity and capability to engage in SDM, which is mandatory. However, people in this review could not confront the physiotherapist or assist themselves because they lacked the necessary information and confidence. Consequently, they depended on the physiotherapist and felt powerless. It is important not to misjudge an unwillingness to engage as an incapacity to participate because of a lack of knowledge, confidence, or absence of an atmosphere that supports cooperation.^{42–44} This may be as easy as granting individuals express permission to participate, or it could be as difficult as questioning attitudes and behaviors at the individual and social levels.⁴⁵

This study had some strengths and limitations. The study's findings provide insight into the many factors that impact people's capability and confidence levels when participating in SDM in MSK physiotherapy. The nature of cross-sectional studies and the use of the Likert scale as a data collection tool are associated with several biases that should be considered.

Future research may consider observing SDM across diagnosis-specific MSK conditions and analyzing the interface of pain or disability with SDM. This can help establish SDM models tailored to particular conditions and aid the efficacy of SDM.

Conclusion

The findings demonstrate that people generally desire to be engaged in decision-making and provide a fresh perspective on their experiences with SDM in MSK physiotherapy. It depicts how people view the main criteria that must be met for SDM to be effective. However, a lack of opportunity, confidence, and capacity on the part of the individual were the primary factors that hindered collaborative decision-making.

Moreover, our study reveals that physiotherapists' attitudes and behaviors significantly influence patients' experiences and attitudes toward SDM in MSK physiotherapy. Therefore, for SDM to be effective, physicians should provide decision support via communication that goes in both directions, sharing their knowledge in an easily digestible manner and actively listening to and acting on individuals' preferences. Building a foundation of trust among participants is also necessary before they feel comfortable enough to participate. Finally, physiotherapists should be aware of the influence they wield in their roles as healthcare professionals and be willing to accept the responsibility of cultivating an atmosphere that actively promotes people's participation, self-efficacy, and empowerment through a balanced distribution of power.

Data Sharing Statement

All data are available from the corresponding author upon reasonable request.

Ethics Approval and Informed Consent

This study was approved by The Ethical Committee of Applied Medical Sciences, Prince Sattam Bin Abdulaziz University, Al Kharj, Kingdom of Saudi Arabia (No.: RHPT/021/014). Informed consent was obtained from all participants involved in the study.

Consent for Publication

All participants provided consent for the publication of identifiable details, including photographs and/or videos and/or case history and/or details within the text to be published.

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Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

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