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Review Article

Nursing Intervention Toward Quality of Life of Patients Undergoing Hemodialysis: A Systematic Review

Gunawan Susanto^{1*} | Arif Setyo Upoyo²

¹Postgraduate Nursing program, Faculty of Health Science, Universitas Jenderal Soedirman, Purwokerto, Indonesia.

²Doctor of Nursing Practice, Associate Professor at Indonesia's Universitas Jenderal Soedirman, Purwokerto, Indonesia

*contact

gunawan.susanto@mhs.unsoed.ac.id

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Abstract

Aims: Patients diagnosed with chronic renal disease commonly experience a diminished quality of life. This systematic review endeavors to discern nursing interventions aimed at enhancing the quality of life among individuals with chronic kidney disease undergoing hemodialysis. These interventions adopt a holistic approach, encompassing psychological, social, and physical aspects.

Methods: A systematic review methodology was employed, utilizing ProQuest, Science Direct, and Google Scholar to search for relevant publications. In order to retrieve pertinent information, the databases were searched for complete English-language research articles published from 2013 to 2023.

Results: This study investigates two intervention categories, specifically physical and non-physical, aimed at improving the quality of life for individuals undergoing hemodialysis due to chronic renal disease. Deliberations reveal that non-physical activities positively impact the psychological and social well-being of chronic kidney disease patients undergoing hemodialysis, whereas physical exercise promotes increased strength and endurance

Conclusions: Dialysis has an adverse effect on all dimensions of Quality of Life for individuals with Chronic Kidney Disease. This review serves as a valuable resource for clinicians, offering insights into the implementation of comprehensive nursing interventions for Chronic Kidney Disease patients undergoing dialysis, encompassing physical, psychological, and social aspects. Subsequent research endeavors should prioritize exploring the spiritual dimension, given the promising outcomes observed in spiritual interventions, which have demonstrated effectiveness in mitigating pain, addressing concerns related to death, and enhancing overall well-being.

Keywords:

Hemodialysis, Nursing Intervention, Quality Of Life, Review

INTRODUCTION

Chronic kidney disease (CKD) is a very prevalent non-communicable chronic

condition that affects people worldwide. Based on forecasts from the World Health Organization (WHO), CKD is expected to rank as the fifth most common chronic

disease by the year 2040 (1). Globally, kidney illness affects more than 850 million people (2). In the Southern Denmark Region, the prevalence and frequency rates for stages 3-5 of CKD were between 4.83% and 4.98%, with an annual occurrence rate of 0.49% (3).

Hemodialysis (HD) continues to be the most used method of dialysis in many nations across the globe (4). Although there have been improvements in hemodialysis treatment, persons who undertake this therapy still face a range of physical, psychological, spiritual, and social difficulties. Common symptoms include fatigue, muscle cramps, discomfort, difficulty sleeping, shortness of breath, itching, sadness, queasiness, throwing up, and difficulty passing stool. Have a substantial impact on an individual's daily functioning and overall quality of life (5). This highlights the widespread nature of the challenges in the quality of life experienced by patients with CKD, who have a worse health-related quality of life (HRQoL) compared to persons with other chronic diseases (6).

Nursing intervention should use a comprehensive approach, taking into account the psychological, spiritual, and emotional dimensions of health. Several treatments have shown significant promise in improving the quality of life for persons undergoing hemodialysis for CKD. This systematic review seeks to identify therapies that might improve the quality of life for patients with CKD who are undergoing hemodialysis. The review will analyze many factors including demographics, kinds of interventions, methodology used, and the conclusions of the studies. Our objective is to enhance the quality of life for CKD patients undergoing hemodialysis by conducting research on non-pharmacological nursing interventions. By gaining a thorough understanding of these interventions, we aim to contribute to future research efforts and the development of more effective treatment strategies. Therefore, this study aimed to summarize

nursing intervention toward quality of life of patients undergoing hemodialysis.

METHODS

Design and Research Methods

A thorough investigation was carried out from 2013 to 2023 to find complete English-language research publications. This search included Google Scholars, Science Direct, and Proquest databases. The search used specific keywords like "quality of life," "end-stage renal disease," "hemodialysis," "nursing," and "RCT". The article selection procedure used the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) methodology (7)

Inclusion and Exclusion Criteria

The inclusion criteria were determined based on the PICO framework, with the population consisting of hemodialysis patients. The intervention consisted of nursing actions, while the comparison was made with routine treatments. The outcome of interest was the assessment of the quality of life. The exclusion criteria included review papers, trial methods, and observational studies.

Screening

The primary screening phase was carried out by the principal author, while the content analysis screening was carried out by the other author.

Data Extraction

Data gathered from selected articles were organized into tables containing information about authors, participants, study designs, interventions, and outcomes.

Quality Appraisal

To evaluate the quality of research articles, the Critical Appraisal Skills Programme (CASP) was employed.

Data Analysis

Thematic analysis of the data involved several procedures, including understanding the data, code identification,

theme derivation from the code, theme refinement, and theme announcement (8).

RESULTS

Search Outcome

The search conducted on Google Scholar, Science Direct, and Proquest databases resulted in a total of 18,440 publications. Specifically, 17,900 papers were found on Google Scholar, 21 papers on Science Direct, and 519 papers on Proquest. After an initial examination of the titles and abstracts, it

was determined that fifteen papers were unsuitable. As a result, four out of the eleven articles selected for a thorough examination of the whole text were excluded. Seven supplementary papers were included at the end of the evaluation process (refer to Figure 1). The primary emphasis of these seven papers is on nurse interventions that try to improve the quality of life for patients with chronic renal disease undergoing hemodialysis. Table 1 provides a succinct summary of the investigations or data extraction.

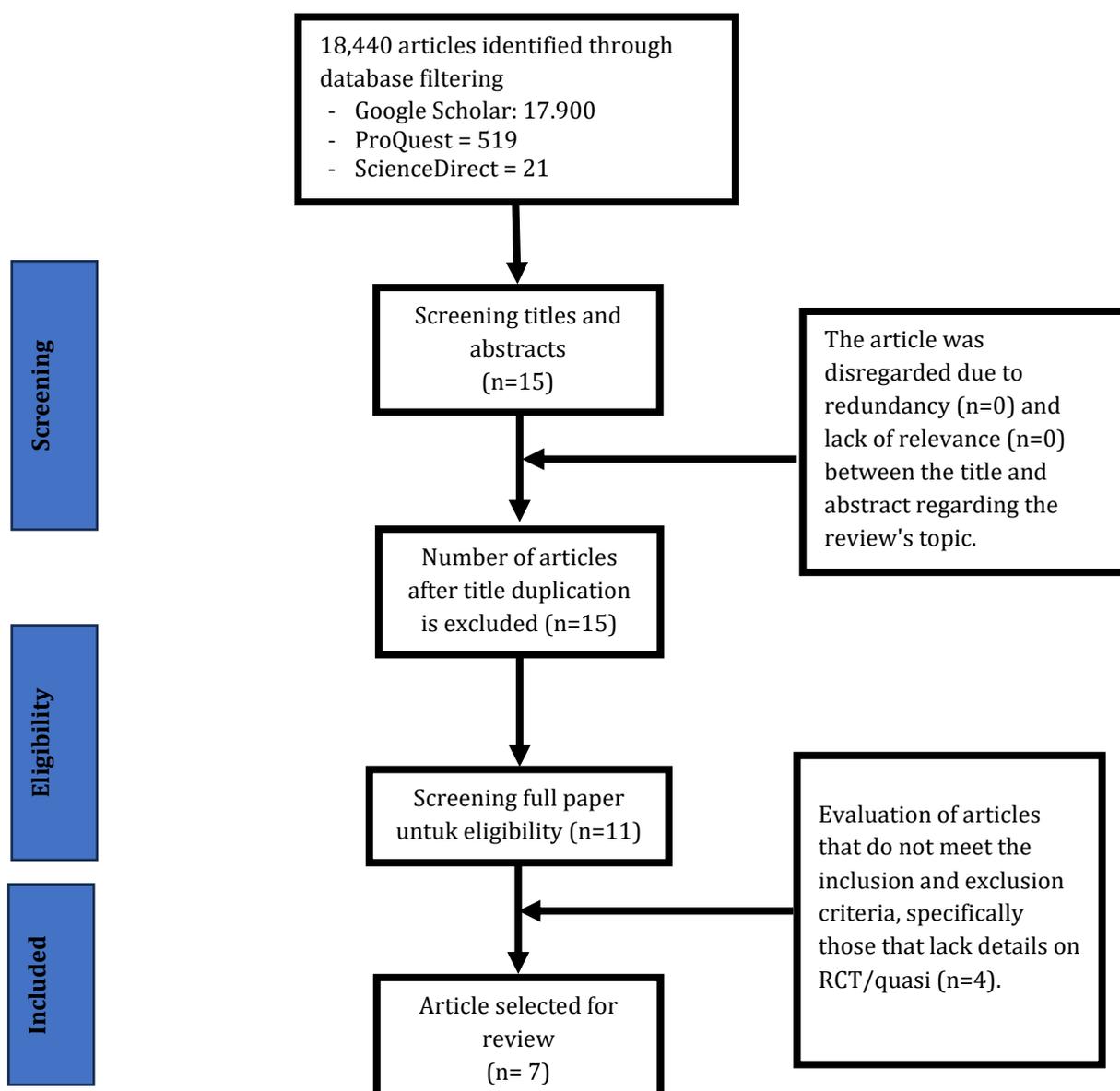


Figure 1. Article selection flowchart.

Table 1. Summary of Included Studies

Authors	Design	Participant	N	Intervention	Duration	Control	Tool	Outcome
						group		
Alkhaqani, 2022 (9)	RCT	Group 1 (Intradialytic resistance exercise) = 32 Group 2 (Regular physical activity) = 31 Control = 31	63	Exercise Therapy	8 weeks	Regular physical activity	SF-36	The significant difference ($p < 0.001$) in health-related quality of life (HRQOL) was evident between the exercise group and the control group.
Kim et al., 2022 (10)	RCT	Group 1 (Intradialytic aerobic exercise) = 18 Group 2 (Education session) = 21 Control = 21	39	Intradialytic aerobic exercise	12 weeks	Educational Sessions	SF-36	Statistical testing for Physical Component Summary (PCS) yielded a value of $z = -2.79$ with $p < 0.01$, indicating a significant difference in the enhancement of physical quality of life between the exercise group and the control group.
Huang et al., 2021 (11)	RCT	Group 1 (Breathing-based leg exercise) = 40 Group 2 (Routine care) = 43 Control = 43	83	Breathing-based leg exercise program	12 weeks	Routine care	WHO QOL-BREF	The quality of life in the experimental group demonstrated a significant elevation ($P = 0.01$) compared to the control group.



Shirazian et al., 2018 (6)	RCT	Group 1 (Cognitive behavioral techniques) n = 20 Group 2 (Educational)= 20 Control = 20	40	Cognitive behavioral techniques	12 weeks	Dialysis Education	KDQOL-36	Upon comparing the Health-related Quality of Life (HrQOL) scores of the intervention group at weeks eight and sixteen with those of the control group, a significant enhancement was noted. Statistical analyses suggest an 85% probability that this intervention can detect an 8-point change in KDQOL-36 scores.
Tao et al., 2015a (12)	RCT	Group 1 (Nurse-Led Case Management Program for Home Exercise Training) n = 57 Group 2 (Center-Based Group Exercise Training) n = 56 Control = 56	113	Nurse-Led Case Management Program for Home Exercise Training	12 weeks	Center-Based Group Exercise Training	KDQOL-36TM	Statistical analysis indicated a significant disparity in the quality of life between the hemodialysis patients in the intervention group and the control group. Notably, the physical component exhibited a noteworthy difference between the two groups, as evidenced by $F(1.111) = 7.251, p = 0.027$. Additionally, a discernible inclination toward significance was observed in the mental component between the intervention and control groups, indicated by $F(1.111) = 4.291, p = 0.117$.
Ok & Kutlu, 2021 (4)	RCT	Group 1 (Motivational Interviewing) n = 30 Group 2 (Face to face interview) = 30 Control = 30	60	Motivational Interviewing (MI)	Three months	Face to face interview	SF-36	The quality of life scores did not significantly differ between the intervention and control groups. However, within the intervention group, there was a notable improvement in quality of life scores between the post-





								test and the 3-month follow-up.
Shahnavazi et al., 2018 (13)	RCT	Group 1 (Emotional intelligence education) n = 21 Group 2 (Conventional education) = 22 Control = 22	47	Emotional intelligence (EI) education programs	12 weeks	Conventional Education	KDQoL-SF36	The primary findings of the study revealed a notable increase in the quality of life scores within the intervention group, rising from 39.94 weeks before the intervention to 44.87 and 52.47 weeks after.



Quality Assessment Results

The selected papers are subjected to a quality evaluation based on their research approach. This assessment utilizes a questionnaire consisting of 13 questions that pertain to the study design. The questionnaire adheres to a randomized controlled trial (RCT) methodology, enabling respondents to provide answers in the form of yes/no/no clear/no. A score of 1 is attributed to "yes" replies, but all other responses are awarded a value of 0. The scores for each question are aggregated, divided by the total number of questions, and then multiplied by 100%. The resultant total score is used to assess the quality of the item, which is classified as excellent (100-80%), satisfactory (79-50%), or unsatisfactory (<50%). Below is a succinct overview of the chosen articles.

Table 2. Assessment Randomized Controlled Trial Article Assessment

No	Item	Article Quality Assessment						
		1	2	3	4	5	6	7
1	<i>Was true randomization used for assignment of participants to treatment groups?</i>	Y	N	Y	Y	N	Y	Y
2	<i>Was allocation to treatment groups concealed?</i>	Y	Y	Y	Y	Y	Y	Y
3	<i>Were treatment groups similar at the baseline?</i>	Y	Y	Y	Y	Y	Y	Y
4	<i>Were participants blind to treatment assignment?</i>	Y	NA	N	U	N	N	N
5	<i>Were those delivering treatment blind to treatment assignment?</i>	Y	NA	N	U	N	N	NA
6	<i>Were outcomes assessors blind to treatment assignment?</i>	Y	NA	N	U	N	N	NA
7	<i>Were treatment groups treated identically other than the intervention of interest</i>	Y	Y	Y	Y	N	Y	Y
8	<i>Was follow up complete and if not, were differences between groups in terms of their follow up adequately described and analyzed?</i>	N	Y	Y	Y	Y	Y	Y
9	<i>Were participants analyzed in the groups to which they were randomized?</i>	Y	Y	Y	Y	Y	Y	Y
10	<i>Were outcomes measured in the same way for treatment groups?</i>	Y	Y	Y	Y	Y	Y	Y
11	<i>Were outcomes measured in a reliable way?</i>	Y	Y	Y	Y	Y	Y	Y
12	<i>Was appropriate statistical analysis used?</i>	Y	Y	Y	Y	Y	Y	Y
13	<i>Was the trial design appropriate, and any deviations from the standard RCT design (individual randomization, parallel groups) accounted for in the conduct and analysis of the trial?</i>	Y	NA	Y	Y	Y	Y	Y

Explanation: Y (Yes), N (No), U (Unclear), NA (Not Applicable)

Analytical Findings

The study involved adult patients undergoing regular hemodialysis, with a total of 445 individuals examined. Tao et al.'s 2015 study had the largest sample size, comprising 113 participants, while Kim et al.'s 2022 study had the smallest, with only 39 participants.

Types of Nursing Intervention

A systematic review, encompassing seven journal publications, revealed two primary intervention types to enhance the quality of life for individuals receiving hemodialysis for Chronic Kidney Disease (CKD): physical exercise interventions and non-physical exercise interventions. The effectiveness of these therapies was assessed through a randomized controlled trial methodology.

Physical Exercise

Strategies to enhance the quality of life for individuals undergoing hemodialysis for Chronic Kidney Disease (CKD) included physical exercise interventions, such as resistance exercise, intradialytic aerobic exercise programs, breathing-based leg exercise programs, and nurse-led home physical exercise case management. The treatments differed in terms of techniques and kinds of training.

There are two models for doing physical workouts, depending on the time of the exercise session. Physical exercises may be performed either during a hemodialysis (HD) session (intradialytic) or apart from the HD session. Aerobic exercise programs are either conducted simultaneously with dialysis treatments or especially during hemodialysis sessions. No interventions other than aerobic activities are used during intradialytic sessions. The physical activities used in different research may vary, however they may generally be categorized into groups such as strength training, flexibility exercises, and stretching routines. The research investigated several exercise modalities, such as aerobic activities, resistance training, and workouts specifically designed to improve leg strength.

Non Physical Exercise

The research found that non-physical exercise therapy, such as motivational interviewing and educational methods, are beneficial for persons with chronic kidney disease (CKD), in addition to interventions that include physical activity. This review included emotional intelligence (EI) training and cognitive-behavioral training as the educational interventions. The review's results revealed that the lengths of instructional interventions in both trials were equal, lasting for a duration of twelve weeks each. In addition, the frequency of delivery did not vary, since sessions for both educational programs were done twice a week.

The instructional material of the two trials differed based on the learning goals. The therapies using cognitive-behavioral tactics included behavior shaping, cognitive restructuring to alter thinking patterns and views on circumstances or difficulties, and other instructional approaches tailored to chronic renal disease. The emotional intelligence education program placed significant emphasis on cultivating the five essential emotional intelligence skills: self-awareness, self-management, empathy, relationship management, and emotional regulation.

In this study, motivational interviewing is used as a non-exercise intervention option. The intervention is designed to last for three months and aims to enhance the overall quality of life for hemodialysis patients by promoting their compliance with treatment protocols. During a span of four weeks, the researcher engaged in individual face-to-face motivational interviewing sessions with every participant in the intervention group on a weekly basis. The duration of each session usually ranged from twenty to forty minutes, with most interviews taking place during the first two hours of the hemodialysis session. The results of the research emphasized that non-exercise therapies, such as motivational

interviewing or education, had a substantial positive impact on the quality of life of persons undergoing hemodialysis for Chronic Kidney Disease (CKD).

DISCUSSION

Patients undergoing hemodialysis are considered highly vulnerable due to their delicate physical and mental health. The enduring nature of managing the illness throughout their lives contributes to a diminished quality of life (QoL) (14). For this review, Ferrell et al.'s QoL model for breast cancer survivors was adopted, encompassing psychological, social, physical, and spiritual aspects, along with four QoL dimensions (15). Holistic nursing interventions for CKD patients on hemodialysis should address their psychological, social, physical, and spiritual well-being. This article summarizes two types of nursing interventions aimed at enhancing the quality of life for individuals receiving hemodialysis for Chronic Kidney Disease (CKD): physical exercise (9–11,16), and non-physical exercise interventions, including education (6,13) and motivational interviewing (4).

Physical exercise interventions aimed at enhancing the quality of life in hemodialysis patients with chronic kidney disease included breathing-based leg exercises, aerobic exercise programs, resistance exercise therapy interventions, and nurse-led case management programs for home exercise training. These interventions, as per the review, significantly enhanced patients' physical quality of life (QoL). Alkhaqani states that various prior studies have highlighted the benefits of exercise interventions, particularly aerobic and strength training, in this population (17,18). These research showed that individuals with chronic kidney disease (CKD) who engage in regular exercise training generally have better health outcomes; nevertheless, the majority of these studies used aerobic training as the intervention. Other research also used strength training

(19,20). Combining home exercise with nurse-led case management proved effective in enhancing physical function and well-being among hemodialysis patients. The intervention aimed to facilitate regular home exercise, with outcome measures including quality of life, 10-repetition sit-to-stand performance, and gait speed. The study group exhibited greater improvements in normal gait speed, while both groups showed enhanced 10-repetition sit-to-stand ability. Only the study group experienced significant gains in quality of life over three time points. Additional studies, such as Junqué-Jiménez A. et al.'s, indicated improvements in functional capacity tests for CKD stage 5 patients (21).

Non-physical nursing interventions play a crucial role in enhancing life quality. The review identified two categories of non-physical interventions: motivational interviewing and educational interventions, such as emotional intelligence education programs and cognitive-behavioral interventions. Both types aimed to enhance psychological, and social aspects. Three interventions significantly improved the quality of life for hemodialysis patients with chronic kidney disease. These results are consistent with Zegarow et al.'s illustration of the efficacy of psychological interventions, particularly cognitive-behavioral therapy, in alleviating symptoms of depression in hemodialysis patients (22). In line with the intervention objectives, diverse educational materials are provided to the intervention group. A structured psychotherapeutic method called Cognitive Behavioral Therapy (CBT) is utilized to focus on and tackle cognitive dysfunction, negative emotions, and maladaptive behavior (6). These activities, rooted in CB strategies such as behavior shaping and cognitive restructuring, encompass the following: reviewing self-management logs, setting goals, formulating medication plans, employing problem-solving strategies, utilizing reinforcing techniques, and addressing coping mechanisms for End-

Stage Renal Disease (ESRD) – the initial six topics (24). Cognitive Behavioral (CB)-based therapies have shown effectiveness in alleviating symptoms of depression, enhancing Health-Related Quality of Life (HRQOL), and augmenting self-management capabilities in ESRD patients (25).

Specific dimensions of emotional intelligence (EI), such as well-being, self-discipline, social adaptability, and mindfulness, exert an influence on mental well-being. The emotional intelligence education program incorporated the five facets of emotional intelligence—self-awareness, self-management, empathy, relationship management, and emotional control—within its instructional materials. Each participant in both the control and intervention cohorts received comprehensive information pertaining to their medical condition, including guidance on adhering to their dialysis prescription and treatment plan, adopting a low-sodium, low-fluid, and low-phosphorus diet, and engaging in physical exercise (26). To ensure holistic patient care, achieve positive trait emotional intelligence outcomes, and prevent psychiatric issues, it is imperative for nurse supervisors to guide nurses in the application of emotional intelligence skills in their daily professional activities (23).

Motivational interviewing (MI) stands as a non-physical nursing intervention approach. This method employs a focused, client-centered strategy, known as motivational interviewing, to stimulate changes in behavior. MI proves effective in assisting ambivalent individuals in overcoming their uncertainty when adhering to medical recommendations. Several literature reviews explore the impact of motivational interviewing on treatment adherence and the quality of life among hemodialysis (HD) patients. While there was no statistically significant disparity in the quality of life scores between the two groups, a substantial increase in these values within the experimental group was noted between the posttest and the 3-month follow-up. A study

conducted by Dashtidehkordi A. et al. demonstrated that motivational interviewing enhances social functioning and alleviates symptoms of anxiety, sadness, and sleep disturbances in patients (27). Another study by Mankih, et al. revealed that the motivational interviewing program significantly contributes to various aspects covered by HPLII, encompassing physical activity, nutrition, spiritual development, personal relationships, stress management, and health responsibility. The program exhibits a positive impact on treatment adherence in hemodialysis patients, as indicated by both objective and subjective parameters (28).

LIMITATION

Some studies may not provide detailed information about the intervention used, such as dose or frequency, making it difficult to evaluate accurately

CONCLUSION

The systematic review investigates interventions aimed at improving the quality of life for individuals undergoing hemodialysis for Chronic Kidney Disease (CKD). These interventions are essential for ensuring that nursing care for CKD patients on hemodialysis adopts a holistic approach, considering social, psychological, spiritual, and physical aspects. Implementation of these interventions can lead to enhanced well-being and various aspects of life for individuals with CKD undergoing hemodialysis.

The findings imply that healthcare providers should consider holistic interventions that address the multidimensional needs of CKD patients on hemodialysis. Future research should focus on the effectiveness of specific interventions, such as exercise programs, psychosocial support, and educational interventions, in enhancing the quality of life for this population. Standardization of reporting intervention details in research

studies is crucial for accurate evaluation and comparison of interventions.

CONFLICT OF INTEREST

The author of this article declares the absence of any conflict of interest.

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There are no pertinent financial or material interests supporting the study that is the topic of this article.

ETHICS APPROVAL

Not applicable

AUTHOR CONTRIBUTION

Each author has made an equal contribution to all phases of this research, encompassing preparation, data collection, analysis, manuscript preparation, and approval for paper publication.

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