Journal of Health and Rehabilitation Research (JHRR)

e-ISSN 2791-156X

THE ROLE OF NUTRITION IN REHABILITATION OF PATIENTS WITH HIP FRACTURES

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ABSTRACT

BACKGROUND: Hip fractures are a common health problem among the elderly population, often leading to reduced mobility and a decline in functional status. The role of nutrition in the rehabilitation of these patients is increasingly being recognized, but further research is required to establish optimal nutritional strategies.

OBJECTIVE: This objective of this research was to evaluate the effectiveness of nutritional supplementation on the rehabilitation outcomes in patients with hip fractures.

METHODS: A clinical trial involving 200 patients with hip fractures was conducted. Random assignment assigned patients to either the intervention group, which received a daily nutritional supplement, or the control group, which received standard medical care. The Mini Nutritional Assessment (MNA), the Barthel Index, and the Timed Up and Go (TUG) test were evaluated at baseline, six months after the intervention, and one year after the intervention.

RESULTS: At 6- and 12-months post-intervention, the intervention group demonstrated significantly improved MNA scores, Barthel Index scores, and TUG test times compared to the control group, indicating improved nutritional status, functional status, and mobility.

CONCLUSION: Nutritional supplementation can significantly improve rehabilitation outcomes in patients with hip fractures. This highlights the need for optimal nutritional strategies to be integrated into the management of hip fracture patients to enhance their recovery.

KEYWORDS: Hip Fractures; Nutrition; Rehabilitation; Randomized Controlled Trial; Mini Nutritional Assessment; Barthel Index; Timed Up And Go Test.

Received: 05-04-2023 Revised & Accepted: 20-04-2023 Published: 10-07-2023

INTRODUCTION

Fractures of the hip are a significant public health problem, particularly among the elderly.(1, 2) Hip fractures are frequently linked to significant morbidity, death, and loss of independence in patients.(3, 4) Because proper nutrition is essential for patients to make a full recovery, there has been a lot of recent research focused on the function that it plays in the rehabilitation process(5, 6). Adequate diet can hasten the healing process, improve muscle strength and function, boost the immunological response, and lower the risk of complications, all of which contribute to a more rapid recovery and an enhanced quality of life.(7-9)

Numerous studies have examined the relationship between nutritional status and outcomes after hip fracture(10, 11). Patients with hip fractures who are protein-energy malnourished are more likely to experience poor rehabilitation outcomes, such as extended hospitalisations, decreased mobility, higher complication rates, and increased mortality. (12-14)

According to intervention research, dietary supplements may aid in the recovery of patients with hip fractures.(15) The randomised controlled trial conducted revealed that oral nutritional supplementation substantially enhanced functional recovery and decreased mortality in older adults following hip

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fracture(16, 17). In a similar vein, author discovered through a systematic review that nutritional supplements, particularly those with a high protein content, increased hip fracture patients' mobility and decreased their risk of pressure ulcers.(18, 19)

In addition to being essential for bone health and rehabilitation after a hip fracture, dietary components like vitamin D and calcium are also very significant.(20, 21) vitamin D and calcium supplements help prevent bone loss, speed up the healing process after a fracture, and lower the likelihood of additional fractures occurring in the future. Despite these findings, it is still unclear what the best dietary plan is for people who have suffered a hip fracture, and additional research is required to produce guidelines that are supported by evidence.(22)

MATERIAL AND METHODS

STUDY DESIGN

This study was a randomized controlled trial (RCT) conducted over a period of 12 months.

PARTICIPANTS

A total of 200 patients with hip fractures, aged 60 years and above, admitted to a tertiary care hospital were recruited for this study.(23)

INCLUSION CRITERIA

Participants were included if they had a surgically treated hip fracture, were able to provide informed consent, and were not involved in any other interventional trials.(24)

EXCLUSION CRITERIA

Patients were excluded if they had a pathological fracture, terminal illness, severe cognitive impairment, allergy to the supplement ingredients, or had contraindications to the nutritional intervention.(25)

DATA COLLECTION PROCEDURE

Participants were randomly assigned to the intervention or control group after receiving informed consent. The intervention group received a nutritional supplement every day for six months, while the control group received standard care.

The patient's demographics, comorbidities, fracture type, and operation details were collected at the outset. Mini Nutritional Assessment (MNA) was used to evaluate nutritional status, while the Barthel Index and Timed Up and Go (TUG) test were used to assess functional status. At the beginning of the intervention, as well as one, three, and twelve months later, evaluations were conducted.

DATA ANALYSIS

SPSS 26.0 was utilised in order to do the analysis on the data. The use of descriptive statistics allowed for the presentation of patient characteristics. The chi-square test was employed to analyse the categorical data, while the t-test was utilised to analyse the continuous variables. recurrent events and situations an analysis of variance was carried out so that a comparison could be made between the two groups' temporal fluctuations. A p-value of 0.05 was utilised so that statistical significance could be determined.

ETHICAL CONSIDERATION

The hospital's Institutional Review Board gave its approval to the procedure that was going to be followed during the investigation. The ethical principles outlined in the Helsinki Declaration were adhered to during each and every process. After being presented with sufficient information, each person who participated in the study granted their consent. The confidentiality of the patient information was preserved throughout the course of the experiment.

RESULTS

There were 200 patients randomized into two equal groups: the control and the intervention groups. Both groups were quite similar in their demographic and clinical profile. The mean age of patients in the control group was 72.6 years (SD=8.2), whereas in the intervention group it was 72.1 years (SD=8.5). The proportion of females was slightly higher in the control group at 62%, compared to 58% in the intervention group.

The prevalence of comorbidities was comparable across the two groups, with the most common being hypertension (50% in control and 52% in intervention) and diabetes (25% in control and 23% in intervention). The type of hip fracture was also distributed fairly evenly. The femoral neck fractures were slightly more common, accounting for 54% in the control group and 56% in the intervention group, while intertrochanteric fractures accounted for 46% in the control and 44% in the intervention group.

At baseline, the mean Mini Nutritional Assessment (MNA) scores were almost identical, 17.4 (SD=2.3) in the control and 17.3 (SD=2.2) in the intervention group. Similarly, the mean Barthel Index was 65.8 (SD=11.6) in the control group and 66.2 (SD=12.0) in the intervention group. Finally, the mean time for the Timed Up and Go (TUG) test was 25.6 seconds (SD=5.4) in the control group and 25.1 seconds (SD=5.1) in the intervention group.

Table 2 presents the outcome variables before and after the intervention. In all outcomes, the intervention group showed significant improvement compared to the control group (P < 0.001). The mean MNA score in the intervention group was higher at both 6 months (23.5, SD=2.4) and 12 months (24.2, SD=2.3), indicating better nutritional status compared to the control group (17.7, SD=2.5 at 6 months and 17.5, SD=2.6 at 12 months). Similarly, the Barthel Index, indicative of functional status, improved more in the intervention group, achieving a mean of 80.1 (SD=10.5) at 6 months and 82.3 (SD=10.8) at 12 months, compared to the control group which achieved a mean of 69.2 (SD=11.2) at 6 months and 70.1 (SD=11.5) at 12 months. The mean TUG times decreased more substantially in the intervention group, from baseline to 15.8 seconds (SD=4.7) at 6 months and 14.5 seconds (SD=4.6) at 12 months, indicating better mobility, while the control group only improved to 20.5 seconds (SD=5.1) at 6 months and 20.1 seconds (SD=5.2) at 12 months.

Table 1: Demographic and Baseline Characteristics

	Control Group (n=100)	Intervention Group (n=100)
Mean Age (years)	72.6 ± 8.2	72.1 ± 8.5
Gender (Female)	62 (62%)	58 (58%)
Gender (Male)	38 (38%)	42 (42%)
Diabetes	25 (25%)	23 (23%)
Hypertension	50 (50%)	52 (52%)
Fracture Type		
Femoral Neck	54 (54%)	56 (56%)
Intertrochanteric	46 (46%)	44 (44%)
Mean MNA score	17.4 ± 2.3	17.3 ± 2.2
Mean Barthel Index	65.8 ± 11.6	66.2 ± 12.0
Mean TUG (seconds)	25.6 ± 5.4	25.1 ± 5.1

Note: Values are Mean ± SD or n(%)

Table 2: Outcome Variables (Pre and Post Intervention)

	Control Group	Intervention Group	P-value
MNA score (6 months)	17.7 ± 2.5	23.5 ± 2.4	< 0.001
MNA score (12 months)	17.5 ± 2.6	24.2 ± 2.3	< 0.001
Barthel Index (6 months)	69.2 ± 11.2	80.1 ± 10.5	< 0.001
Barthel Index (12 months)	70.1 ± 11.5	82.3 ± 10.8	< 0.001
TUG (6 months)	20.5 ± 5.1	15.8 ± 4.7	< 0.001
TUG (12 months)	20.1 ± 5.2	14.5 ± 4.6	< 0.001

Note: Values are Mean ± SD

In all outcomes measures, the intervention group showed significant improvement in comparison to the control group (P < 0.001).

DISCUSSION

The significance of nutrition in the rehabilitation of individuals with hip fractures was demonstrated by our research. In comparison to the control group, participants in the intervention group who received a daily nutritional supplement demonstrated significant improvements in nutritional status, functional status, and mobility. Recent studies have highlighted the benefits of nutritional supplements for patients with hip fractures. (26)

According to Bell et al.'s research from 2022, individuals who have had a hip fracture are more likely to suffer from malnutrition, which is linked to poor outcomes such as limited mobility, higher complications, and extended hospital stays. These findings are supported by our research, which found that the intervention group showed greater progress than the control group did. The Barthel Index scores indicate that the nutritional supplement had a good impact on functional status, which can be attributed to enhanced muscle function and strength, which led to improved mobility and independence as a result of taking the supplement.(27, 28) A prior study discovered similar findings, demonstrating that proper diet is vital for the recovery of functional ability in individuals who had suffered a hip fracture. The TUG test revealed that the mobility of those in the intervention group had significantly improved as a result of the treatment. (29)According to research conducted, improving diet can improve muscular function and physical performance in older persons. This finding is in line with the findings of that study.(30)

CONCLUSION

This study highlights the importance of a nutritious diet to the healing process in patients with hip fractures. The administration of nutritional supplements can enhance the nutritional status, functional capacity, and mobility

of patients, all of which contribute to improved rehabilitation outcomes. More research is required to identify the dietary approaches and interventions that promote recovery in this population the most effectively.

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