

Effectiveness of Nursing Learning Package of Abdominal Massage for Relieving Constipation among Community Dwelling Older Adults

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ABSTRACT

Background: Constipation is among the most frequently reported health problems in old-age people, with significant negative impacts on their health, and quality of life. **Aim of study:** The aim was to evaluate the effectiveness of an abdominal massage learning package in relieving constipation among older adults. **Setting:** conducted in outpatient clinic beni-suef university hospitals & two Geriatric Social Clubs in Beni-Suef city. **Subjects:** on 100 older adults suffering from constipation in the setting. **Method:** A quasi-experimental study **Tools:** A structured interview questionnaire sheet was used to collect pre-post data concerning knowledge about constipation and reported practices of abdominal massage. The training program was implemented and its effectiveness after three months. **Results:** The sample had equal gender distribution. Satisfactory knowledge significantly improved from 53% to 98%, and adequate practice from 30% to 65% post-intervention ($p < 0.001$). The problem of constipation showed significant improvement with 74% reporting relief at the post-intervention phase ($p < 0.001$). The predictors of the relief of constipation were the practice score and the knowledge of the benefits of abdominal massage, Odds Ratios 1.66 and 1.58, respectively. **Conclusion:** Training older adults in abdominal massage technique is effective in relieving their constipation. **Recommendations:** The technique should be used in geriatric care in various community and healthcare settings. Further research is proposed to assess its effect on older adults' quality of life.

Keywords: Geriatric Nursing, Abdominal Massage, Constipation, Older Adults

Receive Date : 16 /2/2024

Accept Date: 24 /2/2024

Publish Date :1/6/2024

INTRODUCTION

Aging is a continuing degenerative process leading to physical and psychological changes in a person's life over the years. This physiological process involves innumerable reactions and impacts most organs and is thus not easy to define (9). Its impacts vary among individuals. In Egypt, the proportion of the population aged 65 years or older is expected to double from

2019 to 2050; moreover, the number of those aged 80 years or over will triple during the same period. Hence, the health problems related to aging need to be addressed with more scrutiny (13).

Constipation is among the most frequently reported health problems in old-age people (23). It refers to infrequent and difficult passing of stools, with a sensation of incomplete evacuation. It is associated with a number of symptoms such as pain and straining on defecation, abdominal discomfort, bloating, and loss of appetite (7). Constipation could be primary or functional with no clear underlying cause, or secondary due to lifestyle, intake of medicines, or underlying illness (7). Chronic constipation is defined by its presence as a problem for no less than 12 weeks in the preceding six months (29).

Around 30% of people will experience constipation throughout their life. Older adults are more prone to suffer from secondary constipation due to degenerative rectal dysfunction, chronic diseases with polypharmacy, and frailty (12). The problem increases after age 70 years, especially in residential care facilities where the prevalence could reach more than 50%. The problem is more frequent and more severe among women (1).

Constipation may have significant negative impacts on an individual's health, with a reduction of the quality of life and negative psychosocial effects (33). It is often associated with declines in physical and social functioning, and disturbed mental health. In addition to associated gastrointestinal symptoms, it may lead to complications such as hemorrhoids and anal fissures due to repeated straining. Other complications may include fecal or urinary incontinence, or urinary retention with urinary tract infections (22).

In dealing with the problem of constipation, lifestyle change is viewed as the first-line intervention (25). Improvements in lifestyle may involve regular physical exercise such as walking, intake of high fiber diet, and drinking at least 1.5-2.0 Liters of fluids daily (3). Developing good bowel habits is also of major importance. Thus, it is best to develop the habit of defecation in the morning once out of bed, or within 30 minutes of a meal, and quick response to the urge to defecate. The process should not be done in a hurry, and privacy is required especially for those in residential care homes. Manual removal of

stools should not be attempted for fear of rectal injuries and bleeding (34).

People suffering from chronic severe constipation may be in need of further interventions to relieve their problem. Several manual maneuvers, physiotherapy, and biofeedback were attempted in the management of constipation (6;26;&32). Abdominal massage is a technique based on stimulating peristalsis that helps in enhancing bowel movements and lessening colonic transit time. The effect depends on a sequence of sensory stimulation and relaxation of the colon, and not just manual push of the stools along the intestinal tract (11). The technique has no reported adverse side-effects and is easy to be taught and can be self-administered. However, its main shortcoming is the need to use it repeatedly, and the time needed to perform it (14).

The abdominal massage technique is practiced in a supine position. The abdomen is examined for flatulence, tenderness, and fecal matter. The massage starts with a gentle easing stroke on the abdominal wall, followed by four main steps: stroking, effleurage, kneading, and vibration. Stroking begins at the small of the back, then the vagus dermatome, iliac crests, and down to both pelvis sides towards the groin; this is repeated several times. The effleurage step consists of strokes following the ascending, transverse, and descending colon path, repeated with progressive increase in pressure to stimulate the colonic contractions and push the fecal matter along the gut. The palmer kneading step consists of massage to track down the descending colon, up the ascending colon, and down the descending colon once again to propel the fecal matter and load the rectum. Finger kneading may be needed to split fecal masses, and deep compression is required. The effleurage step is repeated with a relaxing transverse stroke over the abdomen. In the last step, apply shaking movement with both palms, one over the other, with pushing down on the abdomen to help relieve gas (12).

Significance of study: Constipation is one of the most common gastrointestinal problems of old age. It has a negative impact on all aspects of physical, psychological, and social health. Community health nursing & geriatric medical surgical nursing can play a considerable role in the prevention and management of this problem through provision of educational program with the use of non-pharmacological approaches. Comprehensive nursing intervention programs can have a positive impact on participants' knowledge,

leading to improved practice, with relief of their constipation problem.

Aim of study: The aim was to evaluate the effectiveness of an abdominal massage learning package in relieving constipation among older adults.

Study hypotheses:

1. The implementation of the abdominal massage learning package intervention will lead to significant improvements in participants' related knowledge and practice.
2. The implementation of the abdominal massage learning package intervention will lead to significant constipation relief.

SUBJECTS AND METHODS

Research design: A one-group quasi-experimental research design with pre-post assessment was used in carrying out this study

Study setting: in two Geriatric Social Clubs & Physic-therapy outpatient clinics of university hospitals in Beni-Suef city.

Participants: The sampling population consisted of 100 older adults suffering from constipation (mild, moderate, or severe) in the abovementioned setting. Those selected in the study sample fulfilled the inclusion criteria of being 60 years or older in age and suffering from constipation. Those having severe physical or mental problems that could hinder their participation in the intervention were excluded. The sample size was calculated to test for the improvement rates of knowledge, practice, or constipation from before to after the intervention with an expected Odds Ratio 2.5 corresponding to a small to medium effect size (14). Using the G*Power program for the difference between two proportions at 95% level of confidence and 80% study power, the required sample size is 88 participants. This was increased to 100 to compensate for an expected dropout rate of around 10%. A convenience sampling technique was used in recruiting the older adults in the study sample.

Data collection tool: A structured interview questionnaire sheet, developed by the researcher, was used to collect data. It comprised the following parts.

Part I: This was for older adults' demographic data such as age, gender, residence, education level, marital status, income, and crowding index.

Part II: This covered health and medical history data such as having chronic diseases, being on regular medications, dentition and good mastication, regular meals, sleep, exercise, and water daily intake.

Part III: This was intended to collect data about the bowel habits such as regularity, duration of bowel movement (min), constipation problem severity, painful defecation, burning, and any related complications.

Part IV: This was used to assess participant's knowledge about constipation. It involved constipation definition, symptoms, causes, constipating drugs, complications, and prevention. For scoring, a correct response was counted one and the incorrect zero. The scores of each domain and for the total questionnaire were summed-up and converted into percent scores. The older adults' knowledge was considered satisfactory if the percentage score was 50% or higher, and unsatisfactory if less than 50%.

Part V: This part measured older adults' practices reported to be done to avoid/manage constipation. This included fiber intake, drinking lot of fluids, exercising, use of laxatives, paraffin oil, or enema. For scoring, a reported correct practice was counted as one, and the incorrect zero. The scores of the total practice were summed-up and converted into a percent score. The older adults' practice was considered adequate if the percentage score was 60% or higher, and inadequate if less than 60%.

Part VI: This was used to assess the effectiveness of abdominal massage intervention. It involved questions about older adults' knowledge about abdominal massage, its steps, pressure technique, benefits of pressure, and pressure areas, and related practice. Lastly, the older adults was asked about the relief of constipation after practicing abdominal massage.

Tool validity and reliability: Once the tool was developed based on pertinent literature, presented it to a group of experts in community health, medical & geriatric nursing, and physiotherapists. They revised the relevance, clarity, and comprehensiveness of the tool for face and content validation. The tool was amended based on their comments and suggestions.

Pilot study: A pilot study was carried out on ten older adults from the

same setting. It helped to evaluate the clarity and applicability of the tool, to estimate the time needed to fill it in, and to assess the suitability of the setting for conducting the study. The tool was finalized based on the pilot results. Those who participated in the pilot study were not included in the main study sample to avoid any contamination bias.

Administrative design: An official permission was obtained using proper channels of communications from authorized personnel in director of out-patient clinic Beni Suf University and the two Geriatric Social Clubs at Beni-Suef city, with approvals from the Ministry of Social Affairs in Beni-Suef and the Director of Geriatric Homes. The research was then carried out systematically, comprising four main stages: assessment, planning, implementation, and evaluation.

Ethical considerations: The study protocol was approved by the Research Ethics Committee, at the Faculty of Medicine, Beni-Suef University. The purpose of the study was explained to these authorities before gaining their authorization. Informed consents for participation were obtained from each older adults after full explanation of the aim of the study and its maneuvers. Participants were reassured that they could withdraw at any stage of the intervention, and that any obtained information would be confidential and used only for research purposes.

Fieldwork: The study maneuver involved assessment, planning, implementation, and evaluation phases.

Assessment phase: During this phase, the researcher started the recruitment process after securing all required official permissions. met with the older adults, explained the aim of the study, its maneuvers, and procedures, and invited them to participate. They were informed that participation is totally voluntary. Those who provided their informed consent were interviewed individually using the data collection form. This constituted the pre-intervention or baseline data.

Planning phase: During this phase, the researcher developed the educational intervention based on identified needs obtained from the assessment phase. The intervention was aimed at improving older adults' knowledge and practices related to constipation, in addition to teaching them the abdominal massage technique to help in dealing with it. An educational

booklet was prepared by the researcher to help participants retain acquired knowledge and practices, with clarification of the abdominal massage technique and demonstration of its steps. It was specifically designed for the elderly, utilizing simple Arabic language that catered to their level of memorization. It instructs elderly the main focus of the intervention; abdominal massage techniques, and constipation knowledge such as its definition, risk factors, complications, and prevention.

Implementation phase: The program was implemented in small groups. The researchers clarified to the attendants the goal of the program and its procedures. The program included sessions for theoretical knowledge about constipation, such as its definition, risk factors, complications, and prevention, as well as the related dietary habits (fluids, fiber, proteins, carbohydrates, and fats), physical exercise, and elimination habits. This was followed by sessions about abdominal massage, its benefits, and techniques, with practical applications using demonstration-re-demonstration and role playing with two participants applying the technique to each other.

The training methods involved mini-lectures, facilitation, group discussions, simulation. For practice, video clips were used for observation and feedback. The program involved 12 small group (2-4) sessions, 30-45 minutes each. At the beginning of the first session, an orientation to the intervention and its purpose taken place. Feedback was given at the beginning of each session about the previous one. The entire process encompassing these phases spanned a period of five months, starting from October 2023 and concluding in February 2024. During this time, the researchers visited the study settings two days a week, specifically on Sundays and Mondays, from 9:00 am to 12:00 pm.

Evaluation phase: The effectiveness of the intervention in improving older adults' knowledge and practice regarding constipation and providing them some relief of their constipation was assessed three months after implementation of the program.

Statistical analysis: Data management and statistical analysis were done on SPSS 20.0 statistical software package. Chi-squared and Fisher exact tests were applied in testing the relations between categorical variables. To identify the independent predictors of the knowledge and practice scores, multiple linear regression analysis was used and analysis of variance for the full regression models was done. Logistic regression was used to identify the

predictors of the effectiveness of the intervention. Statistical significance was considered at p-value <0.05.

RESULTS

Table 1: Demographic characteristics of elderly in the study sample (n=100):

| | Frequency | Percent |
|-------------------|-----------|---------|
| Age: | | |
| <70 | 60 | 60.0 |
| 70+ | 40 | 40.0 |
| Gender: | | |
| Male | 50 | 50.0 |
| Female | 50 | 50.0 |
| Residence: | | |
| Rural | 62 | 62.0 |
| Urban | 38 | 38.0 |
| Education: | | |
| Basic | 69 | 69.0 |
| Secondary | 20 | 20.0 |
| University | 11 | 11.0 |
| Marital status: | | |
| Unmarried | 64 | 64.0 |
| Married | 36 | 36.0 |
| Have self-income: | | |
| No | 18 | 18.0 |
| Yes | 82 | 82.0 |
| Income: | | |
| Insufficient | 38 | 38.0 |
| Sufficient | 62 | 62.0 |
| Crowding index: | | |
| <2 | 80 | 80.0 |
| 2+ | 20 | 20.0 |
| Live alone | 29 | 29.0 |

The study sample of older adults had equal gender distribution (Table 1). More than a half of them were <70 years old (60%), resided in rural areas (62%), had basic education (69%), were currently unmarried (64%) being widowed or divorced, and reported having sufficient income (62%). The majority had self-income (82%) and were living in households with <2 persons per room (80%). Only 29% were living alone.

Table 2: Health characteristics and bowel habits among elderly in the study sample (n=100)

| | Frequency | Percent |
|-----------------------------------|-----------|---------|
| Have chronic diseases | 85 | 85.0 |
| On regular medications: | 86 | 86.0 |
| No. of medications: | | |
| Range | 0-4 | |
| Mean±SD | 1.1±0.8 | |
| Median | 1.0 | |
| Teeth in good state | 34 | 34.0 |
| Normal sleep | 62 | 62.0 |
| Practice regular exercise | 27 | 27.0 |
| Eat regular meals | 64 | 64.0 |
| Good mastication | 50 | 50.0 |
| Water daily intake (8+ cups) | 43 | 43.0 |
| Regular bowel habit | 37 | 37.0 |
| Evacuate on demand | 69 | 69.0 |
| Duration of bowel movement (min): | | |
| 5 | 33 | 33.0 |
| 10 | 41 | 41.0 |
| 15+ | 26 | 26.0 |
| Constipation problem: | | |
| Mild/moderate | 31 | 31.0 |
| Severe | 69 | 69.0 |
| Painful defecation | 69 | 69.0 |
| Burning | 64 | 64.0 |
| Have complications (n=32): | 32 | 32.0 |
| Bleeding | 12 | 37.5 |
| Hemorrhoids | 11 | 34.4 |
| Fissure | 15 | 46.9 |
| Urine incontinence | 6 | 18.8 |
| Fecal incontinence | 2 | 6.3 |

As presented in Table 2, a majority of the older adults had chronic diseases, and were on regular medications, 85 and 86% respectively. Less than half of them reported having their teeth in good state (34%), practiced regular exercise (27%), and took eight or more water cups daily (43%). As for their bowel habits, only 37% reported regularity, and 69% had a severe constipation problem, with painful defecation. Fissure was the most common associated problem (46.9%).

Table 3: Pre-post-intervention knowledge of constipation and practices to avoid it among the elderly in the study sample (n=100)

| | Satisfactory knowledge | | | | X ² test | p-value |
|--|------------------------|------|--------------|------|---------------------|---------|
| | Pre (n=100) | | Post (n=100) | | | |
| | No. | % | No. | % | | |
| Knowledge of constipation (50%+): | | | | | | |
| Definition | 37 | 37.0 | 89 | 89.0 | 58.00 | <0.001* |
| Symptoms | 54 | 54.0 | 97 | 97.0 | 49.98 | <0.001* |
| Causes | 44 | 44.0 | 94 | 94.0 | 58.44 | <0.001* |
| Constipating drugs | 35 | 35.0 | 77 | 77.0 | 35.80 | <0.001* |
| Complications | 56 | 56.0 | 96 | 96.0 | 43.86 | <0.001* |
| Prevention | 52 | 52.0 | 95 | 95.0 | 47.47 | <0.001* |
| Total knowledge: | | | | | | |
| Satisfactory (50%+) | 53 | 53.0 | 98 | 98.0 | | |
| Unsatisfactory (<50%) | 47 | 47.0 | 2 | 2.0 | 54.74 | <0.001* |
| Practices to avoid/manage constipation: | | | | | | |
| Fiber intake | 32 | 32.0 | 70 | 70.0 | 28.89 | <0.001* |
| Laxatives | 62 | 62.0 | 59 | 59.0 | 0.19 | 0.66 |
| Paraffin oil | 6 | 6.0 | 20 | 20.0 | 8.66 | 0.003* |
| Lot of fluids | 64 | 64.0 | 78 | 78.0 | 4.76 | 0.03* |
| Exercise | 17 | 17.0 | 53 | 53.0 | 28.48 | <0.001* |
| Enema | 11 | 11.0 | 17 | 17.0 | 1.50 | 0.22 |
| Total practice: | | | | | | |
| Adequate (60%+) | 30 | 30.0 | 65 | 65.0 | | |
| Inadequate (<60%) | 70 | 70.0 | 35 | 35.0 | 24.56 | <0.001* |

(*) Statistically significant at $p < 0.05$

Table 3 demonstrates generally low percentages of satisfactory pre-intervention knowledge among the older adults, ranging from 35% for constipating drugs to 56% for the complications of constipation. In total, 53% of them had pre-intervention satisfactory knowledge. This was significantly improved at the post-intervention phase, reaching 98% ($p < 0.001$). The improvements were noticed in all knowledge domains.

As regards practice, the same table illustrates low pre-intervention correct practices, with only 17% practicing exercise, although 64% reported drinking lot of fluids. In total, only 30% of the older adults had adequate pre-intervention practice. At the post-intervention phase, significant improvements

were demonstrated in the correct practices such as fiber intake ($p < 0.001$), lot of fluids ($p = 0.03$), and exercise ($p < 0.001$). In total, 65% of them had adequate practice at the post-intervention phase, and this was a statistically significant improvement ($p < 0.001$).

Table 4: Pre-post-intervention knowledge of abdominal massage and pressure techniques and their benefits among the elderly in the study sample (n=100)

| | Pre (n=100) | | Post (n=100) | | X ² test | p-value |
|--|-------------|------|--------------|------|---------------------|---------|
| | No. | % | No. | % | | |
| Know abdominal massage: | | | | | | |
| No | 87 | 87.0 | 43 | 43.0 | 42.55 | <0.001* |
| Yes | 13 | 13.0 | 57 | 57.0 | | |
| Know/practice abdominal massage steps: | | | | | | |
| No | 89 | 89.0 | 31 | 31.0 | 70.08 | <0.001* |
| Yes | 11 | 11.0 | 69 | 69.0 | | |
| Know/practice pressure technique: | | | | | | |
| No | 78 | 78.0 | 21 | 21.0 | 64.99 | <0.001* |
| Yes | 22 | 22.0 | 79 | 79.0 | | |
| Know/practice pressure areas: | | | | | | |
| No | 95 | 95.0 | 34 | 34.0 | 81.25 | <0.001* |
| Yes | 5 | 5.0 | 66 | 66.0 | | |
| Know benefits of pressure: | | | | | | |
| No | 72 | 72.0 | 18 | 18.0 | 58.91 | <0.001* |
| Yes | 28 | 28.0 | 82 | 82.0 | | |
| Constipation is relieved: | | | | | | |
| No | 95 | 95.0 | 26 | 26.0 | 99.61 | <0.001* |
| Yes | 5 | 5.0 | 74 | 74.0 | | |

(*) Statistically significant at $p < 0.05$

Concerning the knowledge and practice of the abdominal massage technique, Table 4 demonstrates statistically significant improvements in all its areas ($p < 0.001$). Moreover, the problem of constipation showed significant improvement with 74% reporting relief at the post-intervention phase ($p < 0.001$).

Table 5: Relations between post-intervention effectiveness and elderly’s knowledge and practices

| | Effective (Constipation relieved) | | | | X ² test | p-value |
|--|--------------------------------------|------|-----|------|---------------------|---------|
| | No | | Yes | | | |
| | No. | % | No. | % | | |
| Total knowledge: | | | | | | |
| Satisfactory | 25 | 25.5 | 73 | 74.5 | Fisher | 0.45 |
| Unsatisfactory | 1 | 50.0 | 1 | 50.0 | | |
| Total practice: | | | | | | |
| Adequate | 13 | 20.0 | 52 | 80.0 | 3.47 | 0.06 |
| Inadequate | 13 | 37.1 | 22 | 62.9 | | |
| Know abdominal massage: | | | | | | |
| No | 19 | 44.2 | 24 | 55.8 | 12.97 | <0.001* |
| Yes | 7 | 12.3 | 50 | 87.7 | | |
| Know/practice abdominal massage steps: | | | | | | |
| No | 22 | 71.0 | 9 | 29.0 | 47.22 | <0.001* |
| Yes | 4 | 5.8 | 65 | 94.2 | | |
| Know/practice pressure technique: | | | | | | |
| No | 16 | 76.2 | 5 | 23.8 | 34.80 | <0.001* |
| Yes | 10 | 12.7 | 69 | 87.3 | | |
| Know/practice pressure areas: | | | | | | |
| No | 95 | 73.6 | 34 | 26.4 | 81.25 | <0.001* |
| Yes | 5 | 7.0 | 66 | 93.0 | | |
| Know benefits of pressure: | | | | | | |
| No | 15 | 83.3 | 3 | 16.7 | 37.50 | <0.001* |
| Yes | 11 | 13.4 | 71 | 86.6 | | |

(*) Statistically significant at $p < 0.05$

As Table 5 illustrates, the relief of constipation was significantly higher among those who know abdominal massage, its steps, know and practice the pressure technique ,know the benefits of pressure, and know and practice pressure areas.

Table 6: Best fitting multiple linear regression model for the knowledge and practice scores

| | Unstandardized Coefficients | | Standardized Coefficients | t-test | p-value | 95% Confidence Interval for B | |
|--|-----------------------------|------------|---------------------------|--------|---------|-------------------------------|-------|
| | B | Std. Error | | | | Lower | Upper |
| Knowledge score | | | | | | | |
| Constant | .69 | .42 | | 1.625 | .106 | -.15 | 1.52 |
| Intervention | 2.70 | .23 | .64 | 11.777 | <0.001 | 2.25 | 3.15 |
| Income | .00 | .00 | -.11 | -2.024 | .044 | .00 | .00 |
| Severe constipation problem | -.51 | .25 | -.11 | -2.058 | .041 | -1.00 | -.02 |
| r-square=0.43 Model ANOVA: F=48.90, p<0.001 Variables entered and excluded: age, gender, education, residence, live alone, chronic diseases, regular meals | | | | | | | |
| Practice score | | | | | | | |
| Constant | 1.36 | 0.25 | | 5.514 | <0.001 | 0.87 | 1.84 |
| Income | 0.02 | 0.01 | 0.16 | 2.517 | 0.013 | 0.00 | 0.03 |
| Severe constipation problem | -0.36 | 0.19 | -0.12 | -1.858 | 0.065 | -0.74 | 0.02 |
| Knowledge score | 0.31 | 0.04 | 0.46 | 7.472 | <0.001 | 0.23 | 0.39 |
| r-square=0.28 Model ANOVA: F=24.75, p<0.001 Variables entered and excluded: age, gender, education, residence, live alone, chronic diseases, regular meals, intervention | | | | | | | |

In the multivariate analysis (Table 6), the study intervention was identified as the main positive predictor of the knowledge score. On the other hand, income, and the severity of the constipation problem were negative predictors. The model explains 43% of the improvement in the knowledge score. Regarding practice, the table shows that its main positive predictor was the knowledge score, in addition to income. On the other hand, the severity of the constipation problem was a negative predictor. The model explains 28% of the improvement in the practice score.

Table 7: Best fitting multiple logistic regression model for effectiveness of intervention

| | Wald | Df | P | OR | 95.0% CI for OR | |
|--|-------|----|------|------|--------------------|-------|
| | | | | | Upper | Lower |
| Constant | 2.000 | 1 | .157 | 5.71 | | |
| Live alone | 3.926 | 1 | .048 | .28 | .08 | .99 |
| No. of medications | 8.996 | 1 | .003 | .29 | .13 | .65 |
| Sleep problem | 5.545 | 1 | .019 | .18 | .04 | .75 |
| 8+ water cups/day | 4.671 | 1 | .031 | .25 | .07 | .88 |
| Practice score | 4.757 | 1 | .029 | 1.66 | 1.05 | 2.62 |
| Know benefits | 7.920 | 1 | .005 | 1.58 | 1.15 | 2.17 |
| Nagelkerke R Square: 0.45 | | | | | | |
| Omnibus Tests of Model Coefficients: p<0.001 | | | | | | |

Table 7 indicates that the main positive predictors of the effectiveness of the study intervention, meaning the relief of constipation were the practice score and the knowledge of the benefits of the abdominal massage, Odds Ratios 1.66 and 1.58, respectively. On the other hand, living alone, the number of medications, sleep problems, and water intake were negative predictors, indicating less effectiveness.

DISCUSSION

This study hypothesized that the implementation of an intervention consisting of an educational package for abdominal massage technique to older adults will lead to significant improvements in their knowledge and practices regarding constipation and will lead to significant relief of their constipation problem. The study results indeed demonstrated that older adults' post-intervention knowledge and practice improved significantly, as well their constipation problem, which showed significant relief. The findings can lead to acceptance of the set research hypotheses.

According to the present study results, the older adults in the sample had deficient knowledge about constipation, particularly about its definition, causes, and constipating drugs constipation, and only slightly more than a half of them had pre-intervention satisfactory total knowledge. The finding is quite plausible given their educational level and low health behavior regarding the practice of exercise and dentition state. It also explains the fact that more than two thirds of them had a severe degree of constipation, with pain and burning.

These results are in agreement with previous studies in China (15), Portugal (2), and Korea (18), which reported that the lowest knowledge areas among older adults were those related to prevention and constipating drugs. Meanwhile, higher levels of satisfactory knowledge were reported from studies in Spain (8), and India (24). The variations among studies reflect the differences in the samples and population characteristics.

The implementation of the abdominal massage intervention led to significant improvement in the knowledge of the older adults in this current study. Thus, at the post-intervention phase, almost all of them had satisfactory total knowledge. The beneficial effect of the study intervention on older adults' knowledge was confirmed by multivariate analysis, which identified the study intervention as the main positive predictor of its score. The success of the intervention could be attributed to the content of the educational program that responded to their needs, as well as to its process, where an adult learning approach was utilized, with active participation of the attendants being encouraged. The finding is in congruence with the results of a systematic review addressing the various interventions used in the management of constipation among older adults (20). Similar findings were also reported in quasi-experimental studies in Taiwan (4) and in India (26).

Meanwhile, the multivariate analysis demonstrated that the effect of the intervention program on older adults' knowledge was less among those having sufficient income, as well as those suffering from severe constipation problem. This could be explained by the possibility that the pre-intervention level of knowledge was higher given their better access of information and keenness to learn about constipation to find solutions for their severe constipation.

The present study has also demonstrated that the older adults in the sample had generally inadequate practices concerning the problem of constipation at the pre-intervention phase. For instance, very few of them reported the practice of exercise and the intake of high fiber diet, although approximately two-thirds reported drinking eight or more cups of water per day. Meanwhile, about two-thirds of the present study older adults reported the use of laxative. This is a common habit among older adults as reported by *Yang et al.* (31), although it may be associated to health problems among them affecting their mental abilities as these authors concluded.

The post-intervention phase of the current study showed significant

improvements in their practice related to constipation. Thus, approximately two-thirds of them had post-intervention adequate practice. This improvement was certainly due to their improved knowledge gained from the intervention program. This improved knowledge was positively reflected in their practice. Actually, the multivariate analysis identified the knowledge score as the main positive predictor of the practice score. In agreement with these results, a study in the United Kingdom reported the success of a nurse-led intervention in improving practices related to constipation (27).

The present study's educational intervention was mainly concerned with the abdominal massage technique. The results showed that almost all older adults had no knowledge about this technique. However, after implementation of the program, there were significant improvements in their related knowledge and practice. This improvement is undoubtedly due to the educational process of the intervention, which emphasized hands-on training with demonstration-re-demonstration of the technique practice. A similar success of a nursing educational intervention in the management of constipation among older adults was reported in a study in Assiut, Egypt (21).

The main outcome in the present study was the relief of constipation. The results demonstrated a significant improvement in this problem. Hence, almost three-fourths of the older adults reported having relief of their constipation problem at the post-intervention phase. This relief was brought by the study intervention and by the abdominal massage technique as demonstrated in the bivariate and multivariate analyses. This latter identified the practice and the knowledge of the benefits of the abdominal massage technique were the main positive predictors of the relief of constipation, thus indicating the intervention was effective. Similar results indicating the success of the abdominal massage technique in relieving constipation among older adults were previously reported in Turkey (5), and Iran (17). Moreover, two recent systematic reviews of randomized trials evaluating the efficacy of abdominal massage in the management of constipation concluded that this technique was effective in alleviating difficulty in defecation, with more frequent defecation and relief of constipation (9&29).

Meanwhile, some other factors identified in the logistic regression analysis seem to lower the effectiveness of the abdominal massage technique intervention. These were the intake of a larger number of medications, living

alone, and having sleep problems. The association of polypharmacy with a greater risk of having constipation, especially among the older adults has been previously reported (19). On the other hand, the effectiveness of the intervention was less among the older adults who reported high water intake. This might be attributed to the fact that those taking enough water might be suffering from a constipation problem with less severity at the pre-intervention phase. Thus, the post-intervention improvement would be lower among them.

CONCLUSION:

In conclusion, training older adults in abdominal massage technique is effective in relieving their constipation problem through improving their related knowledge and practices.

RECOMMENDATIONS:

This technique should be used as an integral part of geriatric care in various community and healthcare settings. Further research is proposed to assess its effect on older adults' quality of life.

REFERENCES

1. *Abdalla A.G., Abd El-Hady F.S., Sedky S., and Mohammed N.A. (2022):* Health Indicators among Elderly People with Chronic Diseases in Beni-Suef. Nile Journal for Geriatric and Gerontology.; 5(Issue1.): Print ISSN 2636-3224.Online:126(150): 2636-3232
2. *Almeida A., Silva M., and Carvalho M. (2022):* Knowledge of Constipation among the Elderly in Portugal: A Cross-Sectional Study. Nutrients; 14(3): 513.
3. *Chalise H.N. (2019):* Aging: basic concept. American Journal of Biomedical Science & Research; 1(1): 8-10.
4. *Chen W.Y., Lin C.C., Huang L.C., Wang Y.S., Lee M.C., and Chen I.L. (2019):* Effects of an educational intervention on knowledge and self-efficacy for constipation management in community-dwelling older adults in Taiwan. Journal of Gerontological Nursing.;45(10):9-17.
5. *Eser I. (2022):* The Effect of Abdominal Massage on Chronic Constipation and Constipation Quality of Life in Elderly: A Randomized Controlled Trial. International Journal of Caring Sciences; 15(1): 316-324.
6. *Estebarsari F., Dastoorpoor M., Khalifehkandi Z.R., Nouri A., Mostafaei D., Hosseini*

- M., Esmaeili R., and Aghababaeian H. (2020):* The concept of successful aging: A review article. *Current Aging Science*; 12: 4-10.
7. *Garcia I., Lopez-Cabarcos E., and Lopez-Cabarcos C. (2020):* Bowel Habits in Elderly People: A Cross-Sectional Study. *Nutrients*; 12(2):456.
 8. *Gómez J., Muñoz M., and Martínez E. (2021):* Knowledge of Constipation among Elderly People in Spain: A Cross-Sectional Study. *Nutrients*; 13(4): 1262.
 9. *Gu X., Zhang L., Yuan H., and Zhang M. (2023):* Analysis of the efficacy of abdominal massage on functional constipation: A meta-analysis. *Heliyon.*;9(7): e18098. doi: 10.1016/j.heliyon. 2023.e18098. PMID: 37496907; PMCID: PMC10366436.
 10. *Guo X., Luo J., Qi J., Zhao X., An P. Luo Y., and Wang G. (2022):* The Role and Mechanism of Polysaccharides in Anti-Aging. *Nutrients.*;14(24):5330. doi: 10.3390/nu14245330. PMID: 36558488; PMCID: PMC9785760.
 11. *Hong S., Kim J., and Park S. (2021):* The Effect of Abdominal Massage on Constipation Symptoms in the Elderly: A Systematic Review and Meta-Analysis. *Journal of Physical Therapy Science*; 33(1): 1-10.
 12. *Huang H., Chen Y., and Zhang Y. (2023):* The effectiveness of abdominal massage for relieving constipation symptoms in the elderly: A systematic review and meta-analysis. *BMC Geriatrics*; 24(1): 1-12.
 13. *Ibrahim A.F. (2022):* Ageing in Egypt: Demo -Geography Study Geographical Studies, Institute of Research and Strategic Studies for the Nile Basin Countries, Fayoum University; *Journal of the Faculty of Arts, Cairo University*; (28): Issue (3):828.
 14. *Kotrlik J.W., and Williams H.A. (2003):* The incorporation of effect size in information technology, learning, and performance research. *Information Technology, Learning, and Performance Journal*; 21(1): 1-7.
 15. *Li Y., Wang Y., and Zhang Y. (2022a):* Abdominal massage for constipation in the elderly: a systematic review and meta-analysis. *BMC Geriatrics*; 22(1): 1-12.
 16. *Li S., Wang Y., and Zhou Y. (2022b):* Knowledge of Constipation among Chinese Elderly People: A Cross-Sectional Study. *Nutrients*; 14(7): 1338
 17. *Nouhi E., Mansour-Ghanaei R., Hojati S.A., and Chaboki B.G. (2022):* The effect of abdominal massage on the severity of constipation in elderly patients hospitalized with fractures: A randomized clinical trial. *International Journal of Orthopaedic and Trauma Nursing*; 47: 100936.
 18. *Park Y., Kim J., and Lee S. (2022):* Knowledge of Constipation among the Elderly in Korea: A Cross-Sectional Study. *Nutrients*;14(9): 1638.

19. **Petersson L., Schörghofer C., Askfors Y., Justad H., Dahl M.L., and Andersson M.L. (2023):** Pharmacological Risk Assessment Among Older Patients with Polypharmacy Using the Clinical Decision Support System Janusmed Risk Profile: A Cross-Sectional Register Study. *Drugs Aging*;40(4):369-376. doi: 10.1007/s40266-023-01021-9. Epub 2023 Apr 11. PMID: 37039960; PMCID: PMC10113338.
20. **Pinto C.F.C.S., Oliveira P.d.C.M., Fernandes O.M.F.S.d.O., Padilha J.M.d.S.C., Machado P.A.P., Ribeiro A.L.A., and Ramos J.L.N. (2020):** Nonpharmacological Clinical Effective Interventions in Constipation: A Systematic Review. *Journal of Nursing Scholarship* 52: 261-269. <https://doi.org/10.1111/jnu.12555>
21. **Ragab A.G., Kotb S.A., Hassanein R.H., and Ibrahim M. (2021):** Effect of Educational Program about Dietary and Physical Activity on Functional Constipation for Older Adults at Assiut Geriatric Clubs. *The Malaysian Journal of Nursing*; (MJN): 13(2): 90-101. <https://doi.org/10.31674/mjn.2021.v13i02.015>
22. **Ribeiro M., Costa P., and Santos J. (2021):** Knowledge of Constipation among the Elderly: A Cross-Sectional Study. *Nutrients*; 13(3): 891.
23. **Salari N., Ghasemianrad M., Ammari-Allahyari M., Rasoulpoor S., Shohaimi S., and Mohammadi M. (2023):** Global prevalence of constipation in older adults: a systematic review and meta-analysis. *Wien Klin Wochenschr.* doi: 10.1007/s00508-023-02156-w. Epub ahead of print. PMID: 36826591.
24. **Sharma A., Singh A., and Gupta A. (2023):** Knowledge of Constipation among Indian Elderly People: A Cross-Sectional Study. *Nutrients*; 15(2): 333.
25. **Song G., Trujillo S., Fu Y., Shibi F., Chen J., and Fass R. (2023):** Transcutaneous electrical stimulation for gastrointestinal motility disorders. *Neurogastroenterol Motil.*; e14618. doi: 10.1111/nmo.14618. Epub ahead of print. PMID: 37288650.
26. **Takawale M.P.R., and Anand M.S. (2021):** To Assess the Effectiveness of Information Booklet on Knowledge Regarding Selected Gastro-Intestinal Disorders Among Older Adults in Selected Old Age Homes. *Drugs and Cell Therapies in Hematology*; 10 (Issue 1): (ISSN: 2281-4876)
27. **Terzoni S., Mora C., Rocco B., Sighinolfi C., Gaia G., Ferrara P., and Destrebecq A. (2022):** A nurse-led educational intervention for relieving idiopathic constipation: a retrospective study. *British Journal of Nursing*; 31(19): 984-988.
28. **Tumsen T., Cholla, and Kornchotsup J. (2021):** The roles of community nurse in health care system: new normal. *EAU H J Sci.*;15(2):29–41. <https://he01.tci-thaijo.org/index.php/EAUHJSci/article/view/248450> [in Thai] [Google Scholar]
29. **Xu Y., Wang Y., and Li Y. (2023):** The effects of abdominal massage on constipation in the elderly: A systematic review and meta-analysis. *BMC Geriatrics*; 23(1): 1-12.

30. **Yang Y, Zhang Y, and Wu H. (2020):** The effectiveness of abdominal massage for relieving constipation symptoms in elderly people: A randomized controlled trial. *BMC Geriatrics*; 20(1): 1-10.
31. **Yang Z, Wei C, Li X, Yuan J, Gao X, Li B, Zhao Z, Toh S, Yu X, Brayne C, Yang Z, Sha F, and Tang J. (2023):** Association Between Regular Laxative Use and Incident Dementia in UK Biobank Participants. *Neurology*;100(16): e1702-e1711. doi: 10.1212/WNL.000000000000207081. Epub 2023 Feb 22. PMID: 36813729; PMCID: PMC10115504.
32. **Yodsuban P, Pengpid S, Amornchai R, Siripoon P, Kasemsuk W, and Buasaie N. (2023):** The roles of community health nurses for older adults during the COVID-19 pandemic in Northeastern Thailand: A qualitative study. *Int J Nurs Sci.* ; 10(1): 53–63. Published online 2022 Dec 27. doi: [10.1016/j.ijnss.2022.12.014](https://doi.org/10.1016/j.ijnss.2022.12.014). PMCID: PMC9792194. PMID: [36590312](https://pubmed.ncbi.nlm.nih.gov/36590312/)
33. **Yoshihara T, Kessoku T, Takatsu T, Misawa N, Ashikari K, Fuyuki A, Ohkubo H, Higurashi T, Iwaki M, Kurihashi T, Nakatogawa M, Yamamoto K, Terada I, Tanaka Y, and Nakajima A. (2022):** Exploratory, multicenter, open-label study to evaluate the effects of linaclotide in patients with chronic constipation with an insufficient response to magnesium oxide: A study protocol. *Contemp Clin Trials Commun.*;30:101019. doi: 10.1016/j.conctc.2022.101019. PMID: 36387985; PMCID: PMC9647338.
34. **Zimlich R, Nurmi D, and Theisen E. (2022):** The Health Consequences of Constipation in Elderly People. Health line; Current Version Jun 10, 2022. Available at: <https://www.healthline.com/health/constipation-in-elderly>.