

Factors Influencing Constipation among Community Dwelling Older Adults in Beni-Suef: A cross-sectional study

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Background: Chronic constipation is a highly prevalent functional gastrointestinal problem among older adults. The most prevalent factors underlying chronic constipation among those older adults need to be identified. **Aim of study:** The aim was to identify the factors influencing chronic constipation among community dwelling older adults. **Participants:** study was carried out on 100 older adults suffering from constipation, whether chronic or occasional non-chronic. **Setting:** outpatient clinics and two Geriatric Social Clubs randomly selected in Beni-Suef city. **Methods:** A cross-sectional analytic study. **Tool:** A structured interview questionnaire sheet was used to collect socio-demographic, medical, and constipation problem data. **Results:** Median age was 68 years, with equal gender distribution, most in rural areas (62.0%), with basic education (69.0%); 69.0% had chronic constipation problem, mostly <6 months duration (56.5%). Significant relations were revealed between chronic constipation and their teeth state ($p=0.01$), good sleep ($p=0.01$), regular exercise ($p<0.001$), and healthy cooking ($p=0.009$), as well as irregular bowel habits ($p<0.001$), hard/loose stools ($p<0.001$), painful defecation ($p<0.001$), and frequency ($p=0.02$) and duration of defecation ($p<0.001$). In multivariate analysis, the practice of exercise, healthy cooking, and regular bowels were protective with Odds Ratios 0.20, 0.21, and 0.14 respectively. **Conclusion:** Chronic constipation is highly prevalent among older adults, with lack of physical activity, healthy food, and regular bowel habits being its main underlying factors. **Recommendations:** It is recommended to include these identified factors in nurse-led educational interventions for older adults.

Keywords: Gerontology, Chronic constipation, Older adults, Risk factors

Receive Date : 16 /11/2023

Accept Date: 22 /11/2023

Publish Date :1 /1/2024

INTRODUCTION:

Constipation is a highly prevalent functional gastrointestinal problem among older adults. Yet, its true prevalence varies widely among different studies according to the diagnostic criteria used, with self-reporting having the highest

prevalence rates. Thus, its diagnosis is mostly inconsistent, with no supporting documentation (4). A systematic review reported an overall prevalence of 18.9%, with a prevalence of 32.3% in Africa (17). The prevalence is tending to increase (26).

Chronic constipation is defined as having less than three bowel movements per week and/or more than one-fourth of them having type 1/2 Bristol stool form (2). The condition is more prevalent among older adults and in women, with high financial burden on patients, their families, and the healthcare system (7). It has remarkable negative impacts on the quality of life of affected persons (8), and even on the incidence of cardiovascular events and survival among them (8); (10). It can be categorized into primary or secondary types. The primary type may have no clear cause but just slow transit or defecatory disorders. The secondary type has underlying causes such as chronic diseases, anatomic anomalies, or polypharmacy (15).

The assessment of a patient complaining of chronic constipation depends on taking a detailed thorough history, and physical examination, i.e., it is a symptom-based diagnosis (21). Laboratory investigations or imaging are only recommended in the presence of alarming symptoms. The prevention of chronic constipation is of major importance and is directed to changing unhealthy dietary habits, adequate fluid intake, and engaging in regular physical activity (17). Treatment involves, in addition, the use of bulking agents such as high fiber diet, and possibly laxatives especially osmotic types with stimulant types when needed. Intestinal secretagogues may also be used (8);(10). Bowel training in proper defecation posture may be effective (13).

Other non-pharmacological approaches include biofeedback, abdominal massage, acupressure, and aroma therapy (11). These methods are safe, affordable, and acceptable; they can be used by nurses in their care for older adults with constipation at home and in various settings (3).

Significance of the study: Chronic constipation is a highly prevalent problem among older adults with negative impacts on their quality of life. The role of nursing, particularly community and gerontology nurses, is greatly important to help older adults prevent and manage their chronic constipation through increasing their awareness and modifying their lifestyle using educational interventions. To do this, the most prevalent factors underlying chronic constipation among those older adults need to be identified.

Aim of study: The aim was to identify the factors influencing chronic constipation among community dwelling older adults. Chronic constipation is defined according to the (2).

Research questions:

- 1- What are the key factors influencing the prevalence and severity of chronic constipation among older adults living in the community?
- 2- What is the relationship between demographic characteristics, dietary habits, physical activity levels, and bowel habits, good teeth, medication uses and the development chronic constipation in older adults living in the community?

SUBJECT & METHODS

Research design: A cross-sectional analytic research design was used with all dependent and independent variables measured at the same point in time.

Study setting: Physiotherapy Outpatient clinics of university hospitals and two Geriatric Social Clubs randomly selected in Beni-Suef city.

Participants: Older adults permanently residing in Beni-Suef city constituted the study population. The sampling population consisted of those attending two Geriatric Social Clubs randomly selected in Beni-Suef city. The inclusion criteria were having 60+ years age, and suffering from constipation, whether chronic or occasional non-chronic. Those with organic diseases underlying their constipation were excluded.

The sample size was estimated to identify any factor influencing chronic constipation with a moderate effect size Odds Ratio (3.5) according to (5). Using Epi-Info program for the difference between two proportions at 95% level of confidence and 80% study power, the required sample size is 93 participants. The sample size was increased to 100 to account for a 5% non-response rate. The sample was recruited by convenience technique according to the set eligibility criteria.

Data collection tool: A structured interview questionnaire sheet, developed by the researcher, was used to collect data. It comprised the three parts. **Part I:** Socio-demographic data: age, sex, residence, education, marital status, income, and living alone. **Part II:** Medical history: chronic diseases, regular medications, teeth condition, sleep, practice of exercise, dietary habits, and intake of fluids. **Part III:** Details of the constipation problem: chronicity, defecation regularity, frequency, duration, pain, and associated changes.

Tool validity: The researcher developed the tool in view of related literature. It was face and content validated by a group of experts in

community health, Med., surgical Nursing and geriatric nursing. The tool was finalized according to their comments and suggestions.

Pilot study: A pilot study was conducted on 10 older adults representing 10% of the main study sample. It was finalized in view of the pilot results. The pilot participants were included in the main study sample since no changes were required in the tool.

Administrative considerations: The researcher got all required official permission to conduct the study through authorized personnel in the two Geriatric Social Clubs and outpatient clinics. The researcher provided a full explanation of the study aim and procedures to each potential participant to obtain his/her informed consent to participate. They were reassured about confidentiality and anonymity of any obtained information, and that it would be exclusively used in research purpose.

Ethical Approval: The Research Ethics Committee at the Faculty of Medicine, Beni-Suef University approved the study protocol.

Fieldwork: Upon securing all necessary permissions, the researcher started recruiting the required sample according to the eligibility criteria. Each older adult who provided his/her consent to participate, and who was informed that participation was totally voluntary was interviewed. This was done individually using the prepared form in a private location in the study setting. The duration of the interview varied from 20 to 30 minutes according to respondent's cooperation. The researcher took this opportunity to provide the older person with some advices to help in the alleviation of the constipation problem. It was stated from end of September till end of November 2023.

Statistical analysis: The collected data were entered and analyzed using SPSS 20.0 statistical software package. The relations between categorical variables to identify the factors underlying chronic constipation were done using Chi-squared and Fisher exact tests. To identify the independent predictors of chronic constipation, logistic regression analysis was applied using the variables with identified significant associations with constipation in the bivariate analyses. 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
Mean±SD	68.4±6.7	
Median	68.0	
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
Income:		
Insufficient	38	38.0
Sufficient	62	62.0
Live alone	29	29.0

Older adults' median age was 68 years, with equal gender distribution as presented in **Table 1**. The majorities were living in rural areas (62.0%), with basic education (69.0%), widowed or divorced (64.0%), and had sufficient income (62.0%). Slightly less than one-third of them (29.0%) reported living alone.

Table 2: Health characteristics and dietary habits of 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
Practice regular exercise	27	27.0
Normal sleep	62	62.0
Dietary habits:		
Eat regular meals	64	64.0
Good mastication	50	50.0
Eat brown bread	74	74.0
Healthy cooking (less fried/stewed)	36	36.0
Daily intake of:		
Water (8+ cups)	43	43.0
Tea (2+ cups)	70	70.0
Coffee (2+ cups)	2	2.0

Table 2 demonstrates that 85.0 of the older adults in the study sample had chronic diseases, and 86.0% reported being on regular medications. Teeth were in good state in 34.0% of them, only 27.0% were practicing regular exercise, and 62.0% had good night sleep. As regards dietary habits, 64.0% had regular meals, and 74.0% ate brown bread; however, only 43.0% took eight or more water cups daily.

Table 3: Constipation problem and bowel habits of elderly in the study sample (n=100)

	Frequency	Percent
Have chronic constipation problem:		
No	31	31.0
Yes	69	69.0
Duration (months):		
<6	39	56.5
6-<12	17	24.6
12+	13	18.8
Regular bowel habit	37	37.0
Evacuate on demand	69	69.0
Frequency of bowel/day:		
1	48	48.0
2	35	35.0
3	17	17.0
Duration of bowel movement (min):		
5	33	33.0
10	41	41.0
15+	26	26.0
Painful defecation	69	69.0
Change in bowel frequency:		
Decreased	39	39.0
No change	40	40.0
Increased	21	21.0

Concerning the constipation problem and bowel habits, **Table 3** indicates that 69.0% had chronic constipation problem, mostly <6 months duration (56.5%). Only 37.0% reported having regular bowel habits, and 69.0% had painful defecation.

Table 4: Relations between elderly constipation problem and their demographic characteristics

	Chronic constipation				X ² test	OR (95% CI)	p-value
	No		Yes				
	No.	%	No.	%			
Age:							
<70	23	38.3	37	61.7	3.77	2.48(0.98:6.32)	0.052
70+	8	20.0	32	80.0			
Gender:							
Male	15	30.0	35	70.0	0.05	0.91(0.39:2.13)	0.83
Female	16	32.0	34	68.0			
Residence:							
Rural	21	33.9	41	66.1	0.63	1.43(0.59:3.50)	0.43
Urban	10	26.3	28	73.7			
Education:							
Basic	25	36.2	44	63.8	3.35		0.19
Secondary	3	15.0	17	85.0			
University	3	27.3	8	72.7			
Marital status:							
Unmarried	18	28.1	46	71.9	0.69	0.69(0.29:1.66)	0.41
Married	13	36.1	23	63.9			
Income:							
Insufficient	13	34.2	25	65.8	0.30	1.27(0.54:3.02)	0.59
Sufficient	18	29.0	44	71.0			
Live alone							
No	19	26.8	52	73.2	2.06	0.52(0.21:1.28)	0.15
Yes	12	41.4	17	58.6			

As illustrated in **Table 4**, no statistically significant relations could be revealed between older adults' chronic constipation and any of their demographic characteristics. Although more of those aged 70 years or older suffered from chronic constipation, the difference was of borderline significance (p=0.052).

Table 5: Relations between elderly constipation problem and their health characteristics and dietary habits

	Chronic constipation				OR (95% CI)	X ² test	p-value
	No		Yes				
	No.	%	No.	%			
Have chronic diseases:							
No	6	40.0	9	60.0	1.60(0.52:4.97)	0.668	0.21
Yes	25	29.4	60	70.6			
On regular medication:							
No	6	42.9	8	57.1	1.83(0.58:5.82)	Fisher	0.35
Yes	25	29.1	61	70.9			
Teeth state:							
Bad	15	22.7	51	77.3	0.33(0.14:0.18)	6.21	0.01*
Good	16	47.1	18	52.9			
Good sleep:							
No	6	15.8	32	84.2	0.28(0.10:0.76)	6.63	0.01*
Yes	25	40.3	37	59.7			
Regular exercise:							
No	15	20.5	58	79.5	0.18(0.07:0.46)	13.81	<0.001*
Yes	16	59.3	11	40.7			
Regular meals:							
No	8	22.2	28	77.8	0.51(0.20:1.30)	2.03	0.15
Yes	23	35.9	41	64.1			
Good mastication:							
No	13	26.0	37	74.0	0.63(0.27:1.47)	1.17	0.28
Yes	18	58.1	32	64.0			
Eat brown bread:							
No	10	38.5	16	61.5	1.58(0.62:4.03)	0.91	0.34
Yes	21	28.4	53	71.6			
Healthy cooking:							
No	14	21.9	50	78.1	0.31(1.23:-0.76)	6.92	0.009*
Yes	17	47.2	19	52.8			
Adequate water:							
No	16	28.1	41	71.9	0.73(0.31-1.71)	0.53	0.47
Yes	15	34.9	28	65.1			
Excess tea/coffee:							
No	8	26.7	22	73.3	0.74(0.29-1.92)	0.38	0.54
Yes	23	32.9	47	67.1			

(*) Statistically significant at $p < 0.05$

Regarding the relations between older adults' chronic constipation problem and their health characteristics and dietary habits, **Table 5** points to statistically significant relations with their teeth state ($p=0.01$), good sleep ($p=0.01$), regular exercise ($p < 0.001$), and healthy cooking ($p=0.009$). It can be

noticed that the chronic constipation problem was more prevalent among those having bad teeth, no good sleep, no regular exercise, and non-healthy cooking.

Table 6: Relations between elderly constipation problem and their bowel habits

	Constipation				OR (95% CI)	X ² test	p-value
	No		Yes				
	No.	%	No.	%			
Regular bowels:							
No	9	14.3	54	85.7	0.11(0.04:0.30)	22.24	<0.001*
Yes	22	59.5	15	40.5			
Evacuate on demand:							
No	6	19.4	25	80.6	0.42(0.15:1.17)	2.85	0.09
Yes	25	36.2	44	63.8			
Frequency of defecation:							
1	20	41.7	28	58.3	7.66	0.02*	
2	10	28.6	25	71.4			
3	1	5.9	16	94.1			
Duration of bowel movement (min):							
5	19	57.6	14	42.4	17.07	<0.001*	
10	9	22.0	32	78.0			
15+	3	11.5	23	88.5			
Consistency of stools:							
Normal	29	78.4	8	21.6	110.6(22.1-553.2)	61.63	<0.001*
Abnormal (hard/loose)	2	3.2	61	96.8			
Painful defecation:							
No	28	90.3	3	9.7	205.33(39.03:1080.16)	73.92	<0.001*
Yes	3	4.3	66	95.7			

(*) Statistically significant at $p < 0.05$

Table 6 demonstrates statistically significant relations between older adults' chronic constipation problem and their bowel habits. It shows that the problem is significantly more prevalent among those having no regular bowel habits ($p < 0.001$), hard/loose stools ($p < 0.001$), painful defecation ($p < 0.001$), and it increases with the frequency ($p = 0.02$) and duration of defecation ($p < 0.001$). The Odds Ratio of regular bowel habits is clearly protective, whereas those of hard/loose stools and painful defecation denote higher risk.

Table 7: Best fitting multiple logistic regression model for suffering from constipation problem(N=100):

	Wald	Df	P	OR	95.0% CI for OR	
					Upper	Lower
Constant	.62	1	.431	.08		
Practice exercise	6.75	1	.009	.20	.06	.67
Healthy cooking	6.82	1	.009	.21	.06	.68
Regular bowels	11.63	1	.001	.14	.04	.43
Nagelkerke R Square: 0.51						
Hosmer and Lemeshow Test: p=0.187						
Omnibus Tests of Model Coefficients: p<0.001						
Variables entered and excluded (not significant): age, gender, teeth state, sleep, frequency and duration of defecation, stool consistency, painful defecation						

In multivariate analysis, Table 7 demonstrates that the practice of exercise, healthy cooking, and regular bowels are protective against chronic constipation with Odds Ratios 0.20, 0.21, and 0.14 respectively. None of the other older adults' characteristics seem to influence their suffering from chronic constipation.

DISCUSSION

This study was aimed at identifying the factors influencing chronic constipation among community dwelling older adults. The results indicate that in most of the older adults included the constipation problem was chronic. The factors independently and significantly influencing chronic constipation are the practice of physical exercise, eating healthy cooked food, and having regular bowels. All these factors have a protective effect against chronic constipation. All the participants in the current study were suffering from the problem of constipation. However, in approximately two-thirds of them constipation was chronic. This prevalence is slightly lower in comparison to the rate reported by (25) in a study in the United States. The difference could be due to the fact that in our study the older adults were community dwellers, whereas in the other study they were nursing home residents.

The older adults' participants in the present study sample were mostly from rural areas, with basic education, and reportedly sufficient income, thus

representing the characteristics of middle class individuals residing in the study settings. None of these demographic characteristics was found to have a statistically significant relationship with their suffering of chronic constipation. Although the problem of chronic constipation was more common among those 70 years or older; the difference could not reach statistical significance. In this respect, a study of chronic constipation and its relationship with demographic characteristics in the United States revealed significant association with age, where older age persons were more suffering from it, and had less response to its therapeutic management (14).

Concerning the present study's older adults bowel habits, the majority of them reported having no regular bowel habits. This could be an important factors underlying their chronic constipation problem, and it was identified as one of the independent significant predictors in the multivariate analysis. In line with this, the problem of irregular bowel habits has been previously reported with a similarly high percentage in a study of chronic constipation in Bangladesh (16). Moreover, the efficacy of a nurse-led educational intervention of dietary and bowel habits was demonstrated in alleviating the problem of constipation in an Italian study (22). In this respect, the Rome Working Group emphasized the role of food and dietary habits in the prevention and treatment of chronic constipation (20).

In the current study, around two-thirds of the older adults reported having regular meals and eating brown bread, but these dietary habits had no statistically significant relations with their problem of chronic constipation. Meanwhile, the problem was significantly higher among those who reported eating food with non-health cooking, like stewed and spicy food. This latter factor turned to be an independent predictor of chronic constipation in our multivariate analysis.

The finding is in agreement with (12) whose study in China demonstrated the significant effect of good dietary quality in the mitigation of chronic constipation. Similar findings were also reported in a study in Turkey (24). This latter study has also demonstrated the importance of adequate daily water intake in the prevention of chronic constipation. In this respect, more than half of the older adults in the current study reported inadequate fluid intake, which could explain the high prevalence of chronic constipation among them.

The last factor identified in the present study to underly chronic constipation among older adults was the practice of physical exercise and activity. Only around one-fourth of the sample older adults reported practicing regular exercise. Such a lack of regular physical activity could thus underlie their problem. In agreement with this, a study in Japan identified regular physical exercise as a negative predictor of chronic constipation among older adults (19). Additionally, a study in New Zealand reported a significant positive impact of older adults' physical activity on their constipation problem (23). Furthermore, low prevalence of constipation among older adults engaging in regular daily physical activities were reported in studies in Canada (1), and in Japan (9).

The current study has also demonstrated a significant association between sleep and chronic constipation. Thus, chronic constipation was more prevalent among those not having good night sleep. Given the cross-sectional design used in the present study, the temporal relation between sleep and chronic constipation cannot be determined. This means that bad night sleep could be a cause or a consequence of the constipation problem. Nevertheless, and in agreement with our findings, a study in China reported a significant association between chronic constipation and the duration of night sleep (6). However, our study multivariate analysis could not identify night sleep as an independent predictor of chronic constipation.

Another factor significantly affecting chronic constipation identified in the bivariate analysis of the present study was the bad state of teeth, although it did not persist in the multivariate analysis. Thus, the problem was significantly higher among those older adults who had problems with their teeth. The finding is quite plausible given that poor mastication with inadequately shred food could negatively affect the digestive functions of the gastrointestinal tract.

In line with this, a study in China demonstrated a statistically significant association between bad teeth and the risk of constipation (18).

The main study limitations are the relatively small sample size which was suitable for identifying the influencing factors but insufficient for a precise prevalence rate. Also, the results could be generalized with cautions to older

adults in other settings.

CONCLUSION:

In conclusion, chronic constipation is highly prevalent among older adults in the study settings. The main underlying factors are physical activity, healthy food, and regular bowel habits.

RECOMMENDATIONS:

The study recommends the inclusion of these identified factors in nurse-led educational interventions for older adults. The study should be replicated using a stronger longitudinal design for more evidence.

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