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# The effect of prune on the severity of constipation in elderly women



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## ABSTRACT

**Background and Aim:** Constipation is a common digestive problem in elderly people, which has a negative effect on their quality of life. There are many methods in complementary and alternative medicine to treat this problem in the elderly. The aim of this study was to determine the effect of prune as a complementary and alternative medicine on the severity of constipation in elderly women living at Zabol Elderly House.

**Materials and Methods:** This study was an experimental study on 60 elderly women who are qualified residents living at Zabol Elderly House with constipation based on the Rom III diagnostic criteria. The samples were randomly assigned to experimental intervention group and control group, consisting of 30 samples each. The tools used in this study were a demographic questionnaire and a constipation scale. Data were analyzed by SPSS Software Version 20 and Mann-Whitney Test.

**Results:** According to the findings, the difference in the mean of constipation severity in the two groups was not significant before intervention ( $P = 0.61$ ). However, at the end of the first week until the end of the third week after the intervention, there was a significant difference in the mean of constipation severity ( $P < 0.05$ ). This result showed that the effect of the intervention started from the first week and prune was effective in lowering the severity of constipation in the elderly women.

**Conclusion:** This study indicated that prune could be an effective complementary and non-pharmacological method to reduce the severity of constipation in elderly women. Therefore, nurses can use this simple, inexpensive and uncomplicated method as a complementary method to care for the elderly with constipation.

**Keywords:** prune, constipation, elderly

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## INTRODUCTION

Aging is a natural process regarded as one of the stages of human development. During this process, some changes occur in the physiological, psychological and social dimensions of individuals.<sup>1</sup> Nowadays, the phenomenon of aging and problems related to it are important issues that are of a great interest to various intellectuals; hence, it is essential to address it from different perspectives. According to the United Nations Information Center in Tehran, in 2006, four million and five hundred and sixty-two thousand people, approximately 6 percent of the total population of Iran, are over the age of 60 years, which is expected to reach a number of 26 million and 393 thousand (26% of the total population of Iran) in 2050.<sup>2</sup> This means that life expectancy has risen dramatically over the last century.<sup>3</sup> The issue of health related to the increase of lifespan at the moment caused many challenges. The increase of longevity and population growth of the elderly are one of the achievements of the 21st century, and the aging of the population is a phenomenon that societies encounter. Improving hygiene conditions has led to a reduction in mortality, especially child mortality and increased life expectancy. Additionally, the application of

birth control policies has increased the percentage of elderly people to the entire population.<sup>4</sup> Despite this important issue, attention to the needs of the elderly, which is a social necessity, unfortunately, is practically neglected.<sup>5</sup> These facts point to the need to pay more attention to the elderly population. In the elderly people, all body systems undergo some degree of functional deterioration.<sup>6</sup> Changes in the shape and function of the organs inside and outside the body lead to difficult adaptation of the individual to the environment.<sup>7</sup>

Constipation is a common and significant health problem in the elderly, which has a negative impact on their quality of life.<sup>8</sup> More than one-seventh of the adult population in the world suffers from chronic constipation. It constitutes 1% of the annual referral of patients to physicians, resulting in the imposition of high costs on the health system. The incidence of constipation in women is 2 to 3 times that of men.<sup>9</sup> The prevalence of this disorder in the elderly at the age of 60 years and older is 33.5%.<sup>10</sup> Furthermore, approximately 80% of the elderly are admitted to the institutions, and 45% of the elderly in society suffer from it.<sup>3</sup> Annually, constipation leads to 2.5 million visits by

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physicians. The estimated economic value of each patient with constipation is estimated at \$2,752.<sup>11</sup> Lipid medications are among the most commonly used drugs in the world without prescription.<sup>12</sup> Common treatments for constipation have a number of problems.<sup>13</sup> Many of the molecular structures of modern drugs were generated based on the effects of medicinal plants used in the traditional medicine system. Therefore, searching in traditional medicine texts is among the logical solutions to find new drugs.<sup>14</sup>

Prunes are a type of nuts. Prunes are obtained from drying plums.<sup>15</sup> Studies show that aloe vera, which is a dried plum, is rich in antioxidants.<sup>16</sup> There are plenty of niacin, vitamin A, vitamin C, vitamin B6, iron, calcium, potassium, and magnesium in prune.<sup>15</sup> There is also a chemical called hydroxyl phenyl satin in prune, stimulating the soft muscles of the large intestine and producing more efficient bowel movement, and as a result, dried plums are known as a laxative and constipation-relieving agent.<sup>17</sup> It is also rich in fiber and carbohydrates called sorbitol, which prevents constipation.<sup>16</sup>

Regarding the mentioned cases and lack of a study in this field, the present study was conducted to determine the effect of prune on the severity of constipation in elderly women living at Zabol Elderly House.

## METHOD

The present study was a two-group experimental study. The study population consisted of all elderly women living at Zabol Elderly House. Selection of samples was conducted based on the study purpose. The inclusion criteria for the study samples are: female aged 60 years old and over (according to the definition of aging from WHO); diagnosed with constipation based on evidence of documentation of the existing medical records and diagnosed constipation by a physician according to the diagnostic criteria of Rom III; agreed to participate in the study; mentally alert; able to speak; have no history of ileus; have no foot reflexive massage; not using drugs such as anti-Parkinson drugs, sympathomimetics, opiates and anti-diarrhea; have no history of drug use, alcohol and psychotropic drugs. However, the incidence of emergent acute medical side effects during the study, the use of laxatives and dissatisfaction with the study progress were the criteria for the study withdrawal.

To start the study, the informed consent form was completed by the elder or her guardian. The study sample size was determined with 95% confidence coefficient and 85% ability of 30 persons in each group, and then the samples were randomly

divided into two experimental and control groups so that after identifying the elderly with the inclusion criteria, they were included in the list and numbered. Then, they were selected as one among the numbers and entered into the study. The control group were given their usual diet, while for the intervention group, along with the usual diet, 50 grams of prune (approximately 12 prunes) were given per day containing 6 grams of fiber for three weeks.<sup>18</sup> The prunes were soaked in water overnight for easy eating before served to the elderly on the next morning. The research units were made as homogeneous as possible in terms of interventional variables such as economic status, age, daily fluid intake, dietary intake of fiber, and physical activity. The data collection tool was a demographic questionnaire and the Constipation Assessment Scale, which was a valid scientific tool first designed in 1989 by Williams and McMillan to investigate the severity and existence of constipation.<sup>19</sup> This tool evaluates the severity of constipation and includes eight characteristics which are frequency of bowel movements, abdominal distension and flatulence, changes in the amount of gas excretion from the anus, fluid intake from the surrounding stool, feeling of fairness and pelvic pressure, anal pain during bowel movements, low volume of feces, and failure in disposal within the last 24 hours.

The score for this instrument was calculated based on the Likert scale of 5 points from zero to four, and the final score was calculated from the total of the eight characteristics mentioned above and form 32 scores. According to the recorded score, the severity of the constipation were assessed as mild, moderate and severe constipation by the score of 0-8, 9-16, and 25-32, respectively. The content validity method was used to determine the validity of the first part of the questionnaire, namely the demographic questionnaire. The scientific validity of the constipation assessment tool was first confirmed by Milan and Williams with a re-test method of  $r=92\%$ . In 1998, Broussard reevaluated this tool to investigate the severity of constipation in pregnancy and verified it in terms of scientific accuracy and confirmed its reliability with  $r=92\%$ .<sup>19</sup> Tabatabai Chahr (2000) and Ghaffari et al. (2007) confirmed the stability of this tool with Pearson correlation coefficient of  $r=92\%$ .<sup>20</sup> At first, the demographic questionnaire and the test of the constipation of the samples were completed by the researcher himself. After planning agreement with the samples and their families, they were asked to soak 12 prunes (for homogeneity) in some water to be eaten by the elderly each morning before eating breakfast. Following up constipation was conducted at the end of each week until completion of the

study period. After three weeks of intervention, the Constipation Assessment Questionnaire was again completed to compare with the data before the intervention. The data were analyzed using SPSS Software Version 20 and Mann-Whitney Test.

## RESULTS

In this study, 30 patients in the experimental group and 30 subjects in the control group were evaluated. The age range of the elderly was 62-80 years old. Most of the study samples were illiterate (70%); in terms of marital status, widowed (76.7%); economically, weak (80%) and having permanent constipation (83.3%). According to the findings, most of the study samples in the experimental and control groups were 56.66% and 56.66%, respectively suffering from severe constipation before the intervention. Based on weekly observation, the group receiving prune (intervention) showed improvement in the severity of constipation, and at the end of the third week, most of the research units in the intervention group experienced mild constipation (80%). Comparison of weekly changes in the severity of constipation was not significantly different from the control group using the Repeated Measure Test ( $P = 0.08$ ); however, this comparison was significant in the intervention group ( $P < 0.001$ ). (Table 1).

Using Mann-Whitney Test, there was no statistically significant difference in the mean and standard deviation ( $P=0.61$ ) between the control and intervention group before the intervention started. However, at the end of the first to third weeks, this difference was significant ( $P < 0.05$ ), which means that the effect of prune on the severity of constipation in elderly women has been effective since the first week (Table 2).

## DISCUSSION AND CONCLUSION

The findings of this study indicated that the majority of the subjects (56.7% of the control group and 56.7% in the intervention group) suffered from severe constipation before the intervention. Perry and Potter write: As the age increases in the elderly, the muscular tone of the perineal region and the anal sphincter become weaker; as a result, the movements of the intestines are irregular and people at risk of constipation.<sup>21</sup> However, in this study, between different age groups, there was no significant relationship with the severity of constipation, perhaps due to the presence of people in an age group (aging) and no significant difference in the mean age of the study subjects. This finding was consistent with the results of Pour Zanjani et al.<sup>22</sup> In their study, there was no significant relationship between constipation and age. In a study

**Table 1** Analysis and comparison of severity of constipation in the control and intervention groups during the study

Variable			Before intervention	End of the first week	End of the second week	End of the third week	P-value	
			Number (Percentage)	Number (Percentage)	Number (Percentage)	Number (Percentage)		
Severity of constipation	Control group	Mild	0 (0)	0 (0)	0 (0)	0 (0)	0.08	
		Average	17 (56.66)	17 (56.66)	17 (56.66)	17 (56.66)		
		Intense	12 (40)	10 (30.33)	10 (30.33)	10 (30.33)		
		Very intense	1 (3.33)	3 (10)	3 (10)	3 (10)		
	Intervention group	Mild	0 (0)	8 (26.66)	18 (60)	24 (80)		0.001>
		Average	8 (26.66)	16 (53.33)	9 (30)	6 (20)		
		Intense	17 (56.66)	6 (20)	3 (10)	0 (0)		
		Very intense	5 (16.66)	0 (0)	0 (0)	0 (0)		

**Table 2** Comparison of mean and standard deviation of severity of constipation in intervention and control groups before and after intervention

Variable	Control group		Intervention Group		P-value	
	Standard deviation	Mean	Standard deviation	Mean		
Constipation	Before intervention	8.50	25.28	9.68	27.72	0.61
	End of the first week	7.00	36.57	6.67	24.43	0.02
	End of the second week	2.50	40.75	5.32	20.25	0.001
	End of the third week	4.00	43.80	5.22	20.17	0.001

by Abeereldakak et al. in 2013 entitled “Exploring the Use of Plum Juice or Plum Purée as a Laxative for Removing Constipation Due to Acquiring Iron in Pregnant Rats”, the results showed that plum juice or its puree could be used to prevent or treat constipation by normalizing intestinal mucous membranes. The findings of this study are consistent with the results of the present study.<sup>23</sup> Tinker et al. concluded that no gastrointestinal disorder such as diarrhea or loose stool was seen by men after consuming 100 grams of plum dried for 4 weeks, but the dry weight and fecal consistency significantly increased after the treatment. Since the stool consistency increased, it indicates the effectiveness of the plum on the severity of constipation.<sup>24</sup> However, these findings were not consistent with the results of this study, which may be due to the different research population and the amount of the consumed prune.

In one study by Lucas et al., entitled “A Comparative Study of Dried Plums and Dried Apples in Constipation”, it was concluded that the frequency of bowel movements increased during the three months after eating plums, and the results were consistent with the results of the present study.<sup>25</sup> In a study by Attaluri et al. (2011) entitled “Investigation of the Effect of Plum and Psyllium Powder in the Treatment of Constipation”, it was concluded that plum had a better effect in terms of bowel movements and stool consistency compared to psyllium and was effective in the treatment of mild to moderate constipation.<sup>26</sup> The results of this study were also consistent with those of the present study. In a review study by Lever et al. entitled “Investigating the Effect of Prune on Digestive Function”, it was concluded that plum appeared to be more appropriate than psyllium to improve the number of feces excretion and its consistency. This study also stated that although the plum may be a promising intervention to manage constipation and increase fecal consistency, this needs to be confirmed accurately.<sup>27</sup>

The present study showed that prune could be effective as a complementary and non-pharmacological method to decrease the severity of constipation in elderly women, and nurses could use this simple, inexpensive and uncomplicated method as a supplement to care for the elderly with constipation.

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