

## Research Article

# Effectiveness of Health Awareness Module on Pregnant Women's Perception on and Experience of Constipation at Saad Abu Alela – University Hospital, 2017

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### Abstract

**Background:** Pregnancy predisposes women to developing constipation, and hormonal and mechanical factors, sedentary lifestyle, and alteration of diet augments the condition, leading to discomforts experienced by pregnant women. However, this can be controlled through proper education and lifestyle modification. The present study aims to check the effect of health awareness education module on the reduction of constipation among pregnant women.

**Methods:** A quasi-experimental study design was used. One hundred and twenty-five pregnant women were randomly selected from Saad Abu Alela Hospital between January and March 2017, and based on the ROME II criteria, 59 of them were found to have constipation. After obtaining consent from the women, health awareness module (information about constipation, dietary measures, increased fluid intake, and exercise) was offered to them. Data were collected by structured close-ended questionnaire for the knowledge, pre- and post-intervention, and checklists for the practice and follow-up of the weekly outcome over two months. Data were analyzed, and suitable statistical methods was used.  $P < 0.05$  was considered as statistically significant.

**Results:** The overall prevalence of constipation was 47.2% with a prevalence of 4%, 6.4%, and 36.8% in the first, second, and third trimesters of pregnancy, respectively. Pregnant women's knowledge about constipation increased significantly from 16.9% pre- to 92.9% post-intervention with  $P = 0.000$ . The fiber diet intake, fluid intake, and exercise by pregnant women increased from 37.3%, 39%, and 13.6% pre- to 72.9%, 88.1%, and 49.1% post-intervention, respectively) with  $P = 0.001$ . Moreover, 46 (78%) women were relieved of constipation post-intervention.

**Conclusion:** The health awareness module was very effective and significantly increased the level of knowledge, practice, and outcomes with respect to constipation in pregnant women.

**Keywords:** constipation, health awareness, pregnancy

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## 1. Introduction

Constipation is a condition in which a person experiences infrequent bowel movements and sensation of incomplete evacuation resulting in passage of hard stool. It is a common complaint among pregnant women and is considered second to nausea [1]. Fluctuating hormones, diet short on fluids/fiber, lack of exercise, iron pills intake, mechanical effects of the growing fetus, uterine enlargement causing compression of the rectum, paired with general anxiety can all lead to it. Lack of knowledge about the safe management of constipation may complicate the condition. Hormonal changes and increased progesterone in pregnancy causes decreased muscle tone and (GI) motility, leading to constipation [2].

Hemorrhoids and anal fissures are two most severe complications of constipation [3]. Constipation can be very troublesome and complicated by a range of disturbances that affect patients' quality of life and physical health [4, 5]. One method for assessing constipation is the Rome II Criteria, which defines constipation as the presence of at least two of the following symptoms for at least one in four defecation – straining, lumpy or hard stools, sensation of incomplete evacuation, sensation of anorectal obstruction, manual removal to facilitate defecation, and less than three time in the week [6]. Interestingly, the prevalence of constipation in pregnant women ranges from 11 to 38% [7], and those affected by it before pregnancy tend to experience more symptoms while being pregnant [8].

Besides, diet short in fiber, inadequate physical activities, stress and anxiety during pregnancy can also be predisposing factors leading to constipation. However, a number of natural ways can help relieve the suffering caused by constipation. WHO recommends sufficient water and nutritional fiber intake to prevent constipation during pregnancy [9]. There is some evidence that suggest dietary factors such as water intake can prevent, or alleviate, bowel problems during and after pregnancy [10]. In addition, results from a Cochrane review support the benefit of fiber in treating constipation during pregnancy. Fiber intake increases the frequency of defecation and has no side effects. Increased fluid intake as an initial measure is not only inexpensive but also easily obtainable and comes with additional benefits [11]. While constipation can cause discomfort and passive body image conception, it can also lead to psychological problems such as mood fluctuations [12].

In India, the incidence of constipation during pregnancy as one of the morbidities was reported to be lower in women from high-income than those from low-income families [13]. Nutritional elements play a crucial role in preventing, or changing, bowel

habit problems during and after pregnancy [14]. To manage constipation through non-pharmacological measures, mothers should be encouraged for regular bowel movement and to increase their fiber and water intake through fruits and vegetables and by drinking at least eight glasses of water daily. In addition, daily walks, good posture, good body mechanics, and daily exercise contracting the lower abdominal muscles can support venous circulation and prevent congestion in the large intestine [15].

One study reveals that many women experience constipation mainly during their second and third trimesters because of the slowed digestion. However, with increased intake of raw fruits and vegetables, whole grain cereals, fluids, mainly water, the problem can be relieved [16]. Another study of Chinese population shows that increasing dietary fiber intake was successful in relieving chronic constipation [17].

**Justification:** Little is known about the information pregnant women need about constipation and the extent to which they have benefited from the knowledge acquired from training modules. The current study was, therefore, conducted on pregnant women from Saad Abu Alela Hospital who reported having constipation to examine their awareness level of constipation, its management, and health outcome. Patients' nutritional history showed inadequate dietary intake of fibrous food and fluid and a general lack of physical activities and exercises. Non-pharmacological means were recommended initially to manage constipation during pregnancy.

## 1.1. Hypothesis of the study

1.  $H_0$ : Training Module has no significant effect on the level of knowledge, practice, and reduction of constipation in pregnant women.
2.  $H_1$ : Training Module has a significant effect on the level of knowledge, practice, and reduction of constipation in pregnant women.

## 2. Materials and Methods

A quasi-experimental hospital-based study (pre–post intervention) was conducted at Saad Abu Alela Hospital from January to March 2017. One hundred and twenty-five pregnant women were selected randomly during regular antenatal follow-up.

The sample size was calculated as follows:

$$n = Z^2 (PQ)/D^2$$

$$P = 0.2$$

$$Q = (1-p)$$

$$D^2 = (0.07)$$

The proportion was drawn from *the findings of the pilot study* that revealed 0.2% of pregnant women suffer from constipation.

$$(1.96)^2(0.2 \times 0.8) / (0.07)^2 = 3.846 \times 0.16 / 0.0049 = 125$$

$$(1.96)^2(0.2 \times 0.8) / (0.07)^2 = 3.84 \times 0.16 / 0.0049 = 125$$

Next, the women were arranged in chronological order and the sample was selected randomly from the primary healthcare center in Saad Abu Alela Hospital. A total of 59 women had reported constipation based on the ROME II criteria. After obtaining participants' consent, the study was conducted in three phases – pre-intervention (assessment of participants' knowledge and practices using structured close-ended questionnaire for the knowledge and a checklist for the practice); intervention (offering awareness module on constipation management, non-pharmacological measures, dietary measures, exercise, etc. to the participants); and post-intervention (data collection through a structured close-ended questionnaire for knowledge, a checklist for practice and bowel habits, a seven-day stool diary sheet used every week over two months to assess the outcome). Data were analyzed using the SPSS and suitable descriptive and inferential statistical methods were used as paired *t*-test.  $P < 0.05$  was considered the level of significance.

### 3. Results

Out of 125 pregnant women visiting the antenatal clinic, 59 reporting constipation based on the ROME II criteria were studied. Majority of the participants were in the age group of 20–35 years, lived in urban areas, and were housewives. Half of them were university graduates (Table 1).

More than two-third women were multigravida and a majority of them were in their third trimester with regular antenatal follow-up. In addition, previous experience of constipation was reported in more than one-third of them (Table 2). However, the knowledge level of the women about constipation increased significantly after intervention (Table 3). The ability of women in managing constipation improved significantly after intervention (Table 4). A significant change was seen in women's overall health following the intervention (Table 5).

Table 1 shows that 78% of the participants were aged 20–35 years, 52.5% were university graduates, and most of them were housewives 79.7% and lived in urban areas 72.9%.

TABLE 1: Demographic data of the participants,  $n = 59$ .

Data type	Frequency	Percentage
<b>Age (yr)</b>		
<20	2	3.4
20–35	46	78
>35	11	18.6
<b>Residence</b>		
Urban	43	72.9
Rural	16	27.1
<b>Occupation</b>		
Student	2	3.4
Housewife	47	79.7
Working	10	16.9
<b>Education</b>		
Illiterate	2	3.4
Primary	6	10.2
Secondary	20	33.9
University	31	52.5
<b>Economic status</b>		
Insufficient	23	39
Sufficient	36	61

TABLE 2: Obstetrics information of the participants,  $n = 59$ .

Information type	Frequency	Percentage
<b>Number of pregnancies</b>		
Primigravida	19	32.2
Multigravida	40	67.8
<b>Follow-up during pregnancy</b>		
Irregular	15	25.4
Regular	44	74.6
<b>Gestational age (wk)</b>		
1–13	5	8.5
14–26	8	13
27–40	46	78
<b>Had experienced constipation before pregnancy</b>	23	38.9

Table 2 shows that the prevalence of constipation was high in women who were multigravida (67.8%) and in their third trimester and the knowledge of the studied participants about constipation during pregnancy increased significantly post-intervention from 16.9 to 92.9%,  $P = 0.000$ .

Table 4 shows that the management of constipation with non-pharmacological measures post-intervention increased significantly from 30 to 70% with  $P = 0.001$ .

TABLE 3: Knowledge of the study population about causes and management of constipation during pregnancy pre- and post-intervention,  $n = 59$ .

	Pre-intervention		Post-intervention		P-value
	Frequency	%	Frequency	%	
Hormonal changes	16	27.2	59	100	
Iron supplementation during pregnancy	6	9.6	54	91.5	
Anxiety	2	3.4	44	74.6	
Exercises	4	7.2	54	91.5	
Take high fiber diet 25–30 gram daily	20	34.4	59	100	
Take large amount of fluid (10–12 cups daily)	11	19.2	59	100	
<b>Average</b>		16.9		92.9	0.000

TABLE 4: Management of constipation with non-pharmacological measures during pregnancy pre- and post-intervention,  $n = 59$ .

Items	Pre-intervention		Post-intervention		P-value
	Frequency	Percentage (%)	Frequency	Percentage (%)	
Take high fiber diet (25–30 gram daily)	22	37.3	43	72.9	
Take large amount of fluid (10–12 cups daily)	23	39	52	88.1	
Exercises (walking) 1.5 hr three times/wk	8	13.6	29	49.1	
<b>Average</b>		30		70	0.001

TABLE 5: Health status of the study population post-intervention (reduction of constipation),  $n = 59$ .

Outcome	Number of participants	Percentage (%)
The condition totally improved within		
3 wk	8	13.5
4 wk	20	33.9
6 wk	14	23.7
8 wk	4	6.8
Total percentage of improved cases		<b>78%</b>
The condition did not improve and constipation continued	10	17
Constipation continued and led to complications (Hemorrhoids)	3	5.1
Total percentage of cases in which no improvement was seen		<b>22</b>

Table 5 shows that the majority of cases improved after intervention but one-fifth of them reported no improvement, while 5% of them developed complication.

## 4. Discussion

Constipation is common in pregnancy, it may be caused due to hormonal, physical, or mechanical changes, and is usually aggravated by sedentary lifestyle, improper diet, and iron supplementation. A number of natural ways can help reduce the suffering caused by constipation and health awareness and education of pregnant women plays a crucial role in it. The prevalence of constipation in our study was 47.2% and found to be more common in the third trimester of pregnancy (36.8%), which was higher than the rate found in another study, where 24% of the pregnant women developed it, and it was more common in the second trimester of pregnancy 34% [18]. In addition, a correlational study found that the prevalence of constipation was 29.6%, 19%, and 21.8% in the first, second, and third trimesters, respectively [19], while it was 24%, 26%, and 16% in the first, second, and third trimesters, respectively in another study [10]. Although previous evidence shows that the prevalence of constipation is higher in the second and third trimesters, in this study, a high prevalence was seen in the third trimester of pregnancy [20]. Additionally, there is a relationship between constipation and gestational age, 36.8% of the study population experience constipation in the third trimester and is generally caused by the pressure of growing uterus which interferes with bowel movement [4]. The knowledge of pregnant women regarding the causes and management of constipation increased significantly from 16.9% pre- to 92.9% post-intervention; this increase may be related to the fact that most of them were young (78%) – 20–35 years old – and more than half (52.5%) were university-educated. The results of the present study shows the adherence of the module by the women, which = are similar to the results of previous studies that have proved that a majority of pregnant women responded to diet and fluid regulation advice [3, 6, 11] and that fiber supplementation may increase the frequency of stools [16] as the increased fibre diet and fluid intake by the participants in this study increased, respectively, from 37.3% and 39% pre-intervention to 72.9% and 88.1% post-intervention). Additionally, it was found that exercise by pregnant women with constipation increased significantly from 13.6% pre- to 49.1% post-intervention but still more than half of them did not practice it, this may be due to their culture and wrong beliefs. Overall, constipation was treated in the majority of women (46; 77.9%) post-intervention, which is consistent with the results of the study that reveal 35 (72.4%) women responded to conservative treatment [18]; study where after there was an increase in the frequency of bowel movements post-intervention [21]; and studies that supported the safe benefit of fiber in managing constipation in pregnancy [7, 8]. However, constipation persisted in 13 (22%) women

who were multigravida and in third trimester with previous experience of constipation due to the lack of their muscle tone and growing uterus during the third trimester on the lower part of the (GI) tract and rectum. Three women developed hemorrhoids as a result of constipation, as seen in previous studies [14, 22]. Nutrition and exercise were means for prohibiting constipation and its complication in pregnancy. But the complication can develop due to several other factors [23]. Management of constipation with laxatives appears to be more effective in the improvement of constipation but is accompanied by side effect as an increase in diarrhea and abdominal discomfort [16].

The strength of this study was considering the principles of intervention with weekly follow-ups of participants in order to ensure the correct use of intervention as well as answering questions and determining the outcome. In addition, fortunately, our intervention was safe with minimal side effects, so most participants accepted the type of intervention.

## 5. Limitations

A majority of the participants were in their third trimester of the pregnancy. In addition, the small sample size may not give a clear picture of the results. Besides, since this study has been conducted on apparently healthy pregnant women, the results of the present study cannot be generalized on pregnant women with a complicated pregnancy

## 6. Conclusion

Health awareness of pregnant women about constipation was very effective and significantly increased the level of knowledge, practice, and women's health outcomes related to constipation during pregnancy. Constipation is more common in pregnant women, mainly among multigravida women.

## Recommendation

There is an urgent need for regular antenatal classes about self-care and health promotion during pregnancy to prevent constipation.

## Ethical Considerations

The study protocol was approved by the Faculty of Nursing Sciences on January 12, 2017. Participants were informed about the nature of the study and the right to withdraw at any time, without giving any reason. Participants' verbal agreement was obtained and confidentiality was maintained during the gathering, analysis, and interpretation of the participant's data.

## Competing Interests

None.

## Availability of Data and Material

All relevant data of this study are available to any interested researchers upon reasonable request to the corresponding author.

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## References

- [1] Cullen, G., & O'Donoghue, D. (2007). Constipation and pregnancy. *Best Practice & Research. Clinical Gastroenterology*, 21(5), 807–818. <https://doi.org/10.1016/j.bpg.2007.05.005>
- [2] Pourhoseingholi, M. A., Kaboli, S. A., Pourhoseingholi, A., Moghimi-Dehkordi, B., Safaee, A., Mansoori, B. K., Habibi, M., & Zali, M. R. (2009). Obesity and functional constipation; a community-based study in Iran. *Journal of Gastrointestinal and Liver Diseases*, 18(2), 151–155.
- [3] Vazquez, J. C. (2010, August). Constipation, haemorrhoids, and heartburn in pregnancy. *Clinical Evidence*, 2010, 1–17.
- [4] Longo, S. A., Moore, R. C., Canzoneri, B. J., & Robichaux, A. (2010). Gastrointestinal conditions during pregnancy. *Clinics in Colon and Rectal Surgery*, 23(2), 80–89. <https://doi.org/10.1055/s-0030-1254294>

- [5] Thukral, C., & Wolf, J. L. (2006, May). Therapy insight: Drugs for gastrointestinal disorders in pregnant women. *Nature Clinical Practice. Gastroenterology & Hepatology*, 3(5), 256–266. <https://doi.org/10.1038/ncpgasthep0452>
- [6] Bradley CS1, Kennedy CM, Turcea AM, Rao SS, & Nygaard IE. (2007). Constipation in pregnancy: Prevalence, symptoms, and risk factors. *Obstetrics & Gynecology*, 110(6):1351–7. <https://doi.org/10.1097/MEG.0b013e3281108058>
- [7] Trottier, M., Erebara, A., & Bozzo, P. (2012). Treating constipation during pregnancy. *Medecin de Famille Canadien [Canadian Family Physician]*, 58(8), 836–838.
- [8] Wald, A. (2003). Constipation, diarrhea, and symptomatic hemorrhoids during pregnancy. *Gastroenterology Clinics of North America*, 32(1): .322–309 [https://doi.org/10.1016/S0889-8553\(02\)00069-9](https://doi.org/10.1016/S0889-8553(02)00069-9)
- [9] WHO. (2014). Handbook for guideline development, 2<sup>nd</sup> ed. Geneva: World Health Organization. [http://www.who.int/kms/handbook\\_pdf](http://www.who.int/kms/handbook_pdf)
- [10] Derbyshire, E. (2007). The importance of adequate fluid and fibre intake during pregnancy. *Nursing Standard*, 21(24), 40–43. <https://doi.org/10.7748/ns2007.02.21.24.40.c4522>
- [11] Jewell, D. J., & Young, G. (2001). Interventions for treating constipation in pregnancy. [Google Scholar]. *Cochrane Database of Systematic Reviews*, (2), CD001142. Advance online publication. <https://doi.org/10.1002/14651858.CD001142>
- [12] Portalatin, M., & Winstead, N. (2012). Medical management of constipation. *Clinics in Colon and Rectal Surgery*, 25(01): .019–012 <https://doi.org/10.1055/s-0032-1301754>
- [13] Shobeiri, F., & Begum, K. (2005). Morbidity profile of Indian women during pregnancy - A prospective study. *Journal of Postgraduate Medical Institute*, 19(4): 356–359. <https://www.scopus.com/inward/record.uri?eid=2-s2>
- [14] Derbyshire, E., Davies, J., Costarelli, V., & Dettmar, P. (2006, July). Diet, physical inactivity and the prevalence of constipation throughout and after pregnancy. *Maternal and Child Nutrition*, 2(3), 127–134. <https://doi.org/10.1111/j.1740-8709.2006.00061.x>
- [15] Carolyn, L. G., Varney, H., & Kriebs, J. M. (2005). Varney's midwifery (pp. 591–599). 4<sup>th</sup> ed. All India Publishers and Distributors Reg. Medical Book Publisher.
- [16] Rungsiprakarn, P., Laopaiboon, M., Sangkomkarn, U. S., Lumbiganon, P., & Pratt, J. J. (2015). Interventions for treating constipation in pregnancy. *Cochrane Database of Systematic Reviews*, 2015(9), CD011448. Advance online publication. <https://doi.org/10.1002/14651858.CD011448.pub2>

- [17] Jin, J. J., & Pan, L. L. (2009). Efficacy of wheat cellulose treatment on 40 cases of women with functional constipation. *China Practical Medical*, 4(35), 106–108.
- [18] Bimba, K., Patil, G. L., Shridevi, A. S., Praveena, S. N., Asha, B., Mandava, S., Reddy, H. (2017). Prevalence of constipation in pregnancy - A prospective study at a tertiary care hospital. *Journal of Gynecology*, 1(2), 1–11.
- [19] Ponce, J., Martínez, B., Fernández, A., Ponce, M., Bastida, G., Plá, E., Garrigues, V., & Ortiz, V. (2008, January). Constipation during pregnancy: A longitudinal survey based on self-reported symptoms and the Rome II criteria. *European Journal of Gastroenterology & Hepatology*, 20(1), 56–61. <https://doi.org/10.1097/MEG.0b013e3281108058>
- [20] Derbyshire, E., Davies, J., Costarelli, V., & Dettmar, P. (2006, July). Diet, physical inactivity and the prevalence of constipation throughout and after pregnancy. *Maternal and Child Nutrition*, 2(3), 127–134. <https://doi.org/10.1111/j.1740-8709.2006.00061.x>
- [21] de Milliano, I., Tabbers, M. M., van der Post, J. A., & Benninga, M. A. (2012). Is a multispecies probiotic mixture effective in constipation during pregnancy? 'A pilot study'. *Nutrition Journal*, 11, 80. <https://doi.org/10.1186/1475-2891-11-80>
- [22] Shi, W., Xu, X., Zhang, Y., Guo, S., Wang, J., & Wang, J. (2015). Epidemiology and risk factors of functional constipation in pregnant women. *PLoS One*, 10(7), e01335215. [www.ncbi.nlm.nih.gov](http://www.ncbi.nlm.nih.gov) <https://doi.org/10.1371/journal.pone.0133521>
- [23] Vazquez, J. C. (2008). Constipation, haemorrhoids and heartburn in pregnancy. *BMJ Clinical Evidence*, 142(3): 127–134.