

The Prevalence of Constipation and Its Associated Complications in Aseer Region by Using Wexner Scale

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Abstract

Background: Constipation is a common condition in the community which represents a significant burden for both individuals and health care systems. For the individual, constipation is associated with pain and symptoms which negatively impact quality of life. Constipation is a common gastrointestinal problem, which causes many expenses for the community with an estimated prevalence of 1% to 80%, worldwide.

Aim: to assess the prevalence of constipation and its associated complications in Asser region, Saudi Arabia, by using Wexner Constipation Scoring System.

Methodology: A descriptive cross-sectional survey was used targeting all groups of population in Aseer region for at least 6 months, aged 18 years or more, and who agreed to participate in the study. Data was collected using structured questionnaire included person's sociodemographic data, in addition to constipation severity as assessed using Wexner constipation scoring system. The final questionnaire was uploaded using social media platforms and answers were included consecutively till no more answers were obtained.

Results: 939 participants completed the survey; 23.2% of participants had a score of (11-10) = mild constipation, and only 1.3% had a score (21-30) = moderate to severe constipation. The most

common complications related to constipation and high Wexner score were: Hemorrhoid then hernia then rectal prolapse and anal fissure. In regard to most behaviors related to constipation and high Wexner score: change in daily routine was the highest correlated behavior with Wexner constipation score, followed by "smoking". The clinical status related with constipation and high Wexner score: Chronic diseases and frequent use of medications. For marital status, being widowed or divorced was associated with a significantly higher score in Wexner constipation than being single or married. Doing exercises each day was associated with a lower score in Wexner constipation.

Conclusions: In conclusion, the current study showed that chronic constipation was not a common health problem among the study population with higher severity score among old aged participants who were married and in the working group.

Key words: Constipation, prevalence, population, Wexner score, risk factors, complications, Saudi Arabia.

Background

Constipation is defined as difficult and/or rare passage of stool or both [1]. Constipation is a common gastrointestinal problem, which causes much expense for the community with an estimated prevalence of 1% to 80%, worldwide [2] where the condition is characterized by a wide geographical variation. It is noteworthy that the varieties of definitions have led to a wide range of prevalence. The varieties in the description of constipation was the main cause of a wide range of reported prevalence [1]. Several definitions of constipation are due to scientific considerations such as secondary causes (medications), neurological, or systemic diseases. Though, it is well thought to be primary or idiopathic [3]. Consequently, constipation is usually focused in clinical practice and the global population is observing a rapid increase in its incidence [4].

There are different reported symptoms among patients including straining, incomplete evacuation, and a sense of anorectal blockage which are just as significant as reduced stool frequency [5-8]. Numerous factors are involved in the pathogenesis of the disease, such as nature of diet, genetic factors, colonic motility, absorption, social economic status, daily life activities, biological and pharmacological factors [9].

Constipation, especially chronic constipation is associated with many complications which may develop mainly among neglected cases. Hemorrhoids, anal fissure, fecal impaction, rectal prolapse, and developing of inguinal hernia are the most reported associated complications [10-12].

This study aimed to assess the prevalence of constipation and its associated complications in Aseer region, Saudi Arabia, by using Wexner Constipation Scoring System and to shed light on the most predominant risk factors contributing to the development of constipation in Aseer region and to contribute to medical efforts that aim to increase life quality of life of society.

Methodology

A descriptive cross-sectional survey was used targeting all groups of population aged 18 years or more in Aseer region for at least 6 months, and who agreed to participate in the study. Patients with congenital GIT disorders were excluded. Data was collected using structured questionnaire including a person's sociodemographic data, in addition to constipation severity assessed using Wexner constipation scoring system (WCSS) combined with questions relevant to the target of our research. The Wexner constipation scoring system is a scoring system composed of 8 items, with score ranges from 0 – 30; the highest score the more constipation severity [13]. The study questionnaire was reviewed by a panel of 3 experts for validity and applicability and all suggested modifications were considered. The final questionnaire was uploaded using social media platforms and answers were included consecutively till no more answers were obtained.

Statistical analysis

Analyses were conducted using the Statistical Package for Social Studies (SPSS) version 19 for Windows (IBM SPSS, Chicago, IL, USA). Participants' characteristics were summarized using frequency and percentage. Wexner constipation score was summarized using frequency, percentage, mean and standard deviation. Wexner constipation data were scored using the algorithm provided by the instrument manual. To investigate correlations between Wexner constipation score and other variables under study, Spearman correlation was calculated ($p < 0.05$). To determine potential risk factors (predictors) that influence Wexner constipation score, multivariate regression model was used. Only significant correlated variables with this score from the correlation analysis were included in the multivariate regression model. In addition, the assumptions of multiple regression (multicollinearity outliers, normality, linearity, homoscedasticity, and independence of residuals) were tested. Lower variance inflation factor (VIF) values (< 2.5) was used to indicate that no multicollinearity problem was found.

Results

Table 1 summarizes the demographic characteristics of participants ($n=939$). The majority of participants (68.6%) were female and 60.8% were between 18-30 years old. About 59.5% of the participants had a bachelor university degree. More than half of participants (52.7%) were single, and 41.7% of the participants were students, 26.2% were non-employed, and 25.8% were employed.

Table 2, shows the majority of participants (85.5%) were non-smokers, 57.9% were doing some kind of exercises, and 35.1% of them were doing these exercises daily. In addition, the majority of participants (96.5%) eat foods that contain dietary fiber with different rates; 32.7% of them eat a small amount daily, whereas 29.9% of them eat these foods daily. Regarding to the number of water glasses or unsweetened fruit juice consumed per day, the results showed that 47% of participants consumed (1-3) cups and 31.7% consumed (4-6) cups. Moreover, 71.6% of participants go directly to the bathroom when they feel the urge to evacuate. Almost 64% of them did not face any reason that led to a clear change in their daily routine.

Table 3 demonstrates that 675 (71.9%) of participants did not use any medications identified in this table. However, 42% of participants who are using medications take iron supplements and 20.8% take antacids. In addition, 617 (65.7%) of participants did not suffer from any medical condition identified in Table 3. For those who are suffering from medical condition(s), 49.7% of them suffered from irritable bowel syndrome, and 25.8% of them suffered from Hemorrhoids.

According to the complications identified in this study, 55.6% of participants did not have any of these complications as shown in Table 4. On the other hand, 52.8% of participants who are suffering from complications identified "feeling incomplete after evacuation" as a major complication

they suffer. In addition, 32.9% and 31.9% of them suffered from hemorrhoids and anal fissure respectively as major complications. Table 4 also demonstrates that 75.5% of participants score (0-10), 23.2% score (11-10) and only 1.3% score (21-30). However, the mean score of participants in Wexner constipation was 7.15 with a standard deviation of 5.006. These results indicate that a low level of constipation was prevalent among participants.

To investigate the correlation between potential risk factors (demographic characteristics, behaviors related to constipation, clinical status and constipation complications) and scoring in Wexner constipation, Spearman correlation was calculated ($p < 0.05$). Regarding demographic characteristics, Table 5 showed that there were significant correlations between Wexner constipation score and age ($r=0.10$; $p<0.01$), marital ($r=0.08$; $p<0.05$) and employment status ($r=0.20$; $p<0.01$). In addition, all behaviors identified in this study were significantly correlated with Wexner constipation score except the "number of water glasses or unsweetened fruit juice consumed per day". Having a reason that led to a clear change in daily routine was the higher correlated behavior with Wexner constipation score ($r=0.21$; $p<0.01$), followed by "smoking" ($r=0.19$; $p<0.01$) and "going to bathroom directly in case of urgent evacuation" ($r=-0.19$; $p<0.01$). Regarding clinical status variables; suffering from medical conditions ($r=0.41$; $p<0.01$) and use of medications ($r=0.28$; $p<0.01$) showed significant correlations with Wexner constipation score. For constipation complications; this variable showed a higher significant correlation with Wexner constipation score ($r=0.49$; $p<0.01$) compared to other variables under investigation. In addition, all constipation complications identified for this study showed significant correlations with Wexner constipation score. Hemorrhoids showed the higher value of correlation ($r=0.21$; $p<0.01$) with Wexner constipation score.

Table 6 shows the potential risk factors that influence the scoring in Wexner constipation. Only significant correlated variables with Wexner constipation from the correlation analysis (Table 5) were included in the multivariate regression model. Age, employment status, doing any kind of exercise and eating foods that contain dietary fiber did not account for a significant portion of the variance in Wexner constipation score ($p > 0.05$). However, marital status ($p < 0.001$), smoking ($p = 0.042$), times of doing exercises ($p = 0.039$), going to bathroom directly in case of urgent evacuation ($p < 0.001$), having reason that led to a clear change in daily routine ($p < 0.001$), use of medications ($p = 0.005$), suffering from medical conditions ($p < 0.001$), and constipation complications ($p < 0.001$) were significant risk factors (predictors) that influence the scoring in Wexner constipation. These eight risk factors explained 35.7% of variation in Wexner constipation score ($R^2 = 0.357$). According to positive β coefficient ($= 0.124$) for marital status, being widowed or divorced was associated with a significantly higher score in Wexner constipation than being single or married. In addition, smoker participants reported significantly

higher scores in Wexner constipation than non-smokers. According to positive β coefficient ($= 0.086$) for smoking, being smoker was associated with a significantly higher score in Wexner constipation than being non-smokers. Despite doing exercises was not a risk factor for a higher score in Wexner constipation, however times of doing these exercises was a significant risk factor. According to negative β coefficient ($= -0.116$), doing exercises each day was associated with a lower score in Wexner constipation. Participants doing exercises less than once a week or a month reported a significantly higher score in Wexner constipation than participants who are doing exercises daily. The results also indicated that going to the bathroom directly in case of urgent evacuation was associated with Wexner constipation score. According to negative β coefficient ($= -0.135$), participants who adhere to this behavior reported a significantly lower score in Wexner constipation than participants who did not take care of this behavior. On the other hand, having a reason that led to a clear change in daily routine was associated with Wexner constipation score. Positive β coefficient ($= 0.116$) for this variable indicating that participants who have reason that led to a clear change in their daily routine reported a higher score in Wexner constipation than participants who do not have a reason for such change. According to clinical status related variables, use of medications and suffering from medical conditions were associated with Wexner constipation score. Positive β coefficients for both variables ($= 0.077$ and 0.209 respectively) indicating that these two variables were associated with a higher score in Wexner constipation. For constipation complications, having these complications was associated with a higher score in Wexner constipation than the absence of them. Positive β coefficient ($= 0.305$) indicating that participants having constipation complications reported a significantly higher score in Wexner constipation than participants who did not have these complications.

Finally, this study assessed the effect of difficulty in evacuation on participants' lifestyle. As shown from Table 7, 53.8% of participants reported no effect, 28.9% reported low effect, and 13.4% reported moderate effect while only 3.9% reported high effect.

Table 1. Demographic characteristics of study participants

| <i>Characteristics</i> | <i>Frequency</i> | <i>Percent</i> |
|-----------------------------|------------------|----------------|
| Sex | | |
| Male | 295 | 31.4 |
| Female | 644 | 68.6 |
| Age | | |
| 18-30 years | 571 | 60.8 |
| 31-40 years | 167 | 17.8 |
| 41-50 years | 145 | 15.4 |
| 51-60 years | 39 | 4.2 |
| > 60 years | 17 | 1.8 |
| Educational level | | |
| Primary school | 19 | 2 |
| Middle school | 28 | 3 |
| Secondary school | 202 | 21.5 |
| Diploma | 90 | 9.6 |
| University (bachelor) | 559 | 59.5 |
| University (higher studies) | 41 | 4.4 |
| Marital status | | |
| Single | 495 | 52.7 |
| Married | 377 | 40.1 |
| Divorced | 48 | 5.1 |
| Widowed | 19 | 2 |
| Employment status | | |
| Non-employed | 246 | 26.2 |
| Students | 392 | 41.7 |
| Retired | 59 | 6.3 |
| Employed | 242 | 25.8 |

Table 2. Participants' behaviors related to constipation

| <i>Behavior</i> | <i>Frequency</i> | <i>Percent</i> |
|---|------------------|----------------|
| Do you smoke? | | |
| yes | 136 | 14.5 |
| no | 803 | 85.5 |
| Are you doing any kind of exercises? | | |
| yes | 544 | 57.9 |
| no | 395 | 42.1 |
| If yes, how often? | | |
| once a month | 57 | 10.5 |
| once a week | 119 | 21.9 |
| 3 times a week | 177 | 32.5 |
| daily | 191 | 35.1 |
| Do you eat foods that contain dietary fiber? | | |
| no | 33 | 3.5 |
| Less than once a week | 130 | 13.8 |
| 3-5 times a week | 188 | 20 |
| little amount daily | 307 | 32.7 |
| daily | 281 | 29.9 |
| How many total glasses of water or unsweetened fruit juice do you consume per day? | | |
| 1-3 cups | 441 | 47 |
| 4-6 cups | 298 | 31.7 |
| 7-8 cups | 125 | 13.3 |
| >8 cups | 75 | 8 |
| When you feel the urge to evacuate, do you go to the bathroom directly? | | |
| yes | 672 | 71.6 |
| no | 267 | 28.4 |
| Do you have any reason that led to a clear change in your daily routine, such as (travel, marriage, pregnancy, a new job)? | | |
| yes | 337 | 35.9 |
| no | 602 | 64.1 |

Table 3. Participants' clinical status

| <i>Variables</i> | <i>Frequency</i> | <i>Percent</i> |
|--|------------------|----------------|
| Do you use any of these medications? | | |
| no | 675 | 71.9 |
| high blood pressure | 68 | 25.8 |
| iron supplement | 111 | 42 |
| antacids | 55 | 20.8 |
| opioids | 31 | 11.7 |
| non-steroidal anti-inflammatory drugs | 30 | 11.4 |
| calcium supplement | 45 | 17 |
| anti-Parkinson's disease medications | 15 | 5.7 |
| antipsychotics | 30 | 11.4 |
| anti convulsants (anti-epileptics) | 19 | 7.2 |
| Do you suffer from any of these medical conditions? | | |
| no | 617 | 65.7 |
| irritable bowel syndrome | 160 | 49.7 |
| diabetes | 71 | 22 |
| hypothyroidism | 40 | 12.4 |
| hemorrhoids | 83 | 25.8 |
| intestinal obstruction | 18 | 5.6 |
| colorectal cancer | 25 | 7.8 |
| lupus | 11 | 3.4 |
| multiple sclerosis | 5 | 1.6 |
| stroke | 14 | 4.3 |
| Parkinson's disease | 5 | 1.6 |
| spinal cord injury | 12 | 3.7 |

Table 4. Participants' constipation complications and scoring in Wexner constipation

| <i>Variables</i> | <i>Frequency</i> | <i>Percent</i> |
|---|------------------|----------------|
| Have you noticed that you have any of these complications? | | |
| no | 522 | 55.6 |
| anal fissure | 133 | 31.9 |
| feeling incomplete after evacuation | 220 | 52.8 |
| rectal prolapse | 36 | 8.6 |
| hemorrhoids | 137 | 32.9 |
| hernia | 38 | 9.1 |
| scoring in Wexner constipation | | |
| 0-10 | 709 | 75.5 |
| 11-20 | 218 | 23.2 |
| 21-30 | 12 | 1.3 |
| | mean | S.D |
| scoring in Wexner constipation | 7.15 | 5.006 |

Table 5. Bivariate associations between study variables and scoring in Wexner constipation

| <i>Variables</i> | <i>scoring in Wexner constipation</i> |
|---|---------------------------------------|
| <i>Demographic</i> | <i>r</i> |
| Sex | 0.04 |
| Age | 0.10 ** |
| Educational level | -0.07 |
| Marital status | 0.08* |
| Employment status | 0.20** |
| <i>Behaviors related to constipation</i> | |
| Smoking | 0.19** |
| Doing any kind of exercises | -0.07* |
| Times of doing exercises | -0.10** |
| Eating foods that contain dietary fiber | -0.15 ** |
| Number of water glasses or unsweetened fruit juice consumed per day | -0.02 |
| Going to bathroom directly in case of urgent evacuation | -0.19 ** |
| Having a reason that led to a clear change in daily routine | 0.21 ** |
| <i>Clinical status</i> | |
| Use of medications | 0.28 ** |
| Suffering from medical conditions | 0.41 ** |
| <i>Constipation complications (yes-no)</i> | |
| anal fissure | 0.14 ** |
| feeling incomplete after evacuation | 0.13** |
| rectal prolapse | 0.14** |
| hemorrhoids | 0.21** |
| hernia | 0.15** |

**Significant at $p \leq 0.01$ *Significant at $p \leq 0.05$

Table 6. Multivariate model investigating risk factors of Wexner constipation score

| Variables | Wexner constipation score | | |
|---|---------------------------|------------------|----------|
| | B | t | P |
| Demographic | | | |
| Age | -0.052 | -1.544 | 0.123 |
| Marital status | 0.124 | 3.659 | <0.001** |
| Employment status | 0.026 | 0.951 | 0.342 |
| Behaviors related to constipation | | | |
| Smoking | 0.086 | 1.949 | 0.042* |
| Doing any kind of exercises | 0.035 | 0.614 | 0.539 |
| Times of doing exercises | -0.116 | 1.981 | 0.039* |
| Eating foods that contain dietary fiber | -0.038 | -1.353 | 0.177 |
| Going to bathroom directly in case of urgent evacuation | -0.135 | -4.896 | <0.001** |
| Having a reason that led to a clear change in daily routine | 0.116 | 3.872 | <0.001** |
| Clinical status | | | |
| Use of medications | 0.077 | 2.784 | .005** |
| Suffering from medical conditions | 0.209 | 6.845 | <0.001** |
| Constipation complications | | | |
| | 0.305 | 10.434 | <0.001** |
| R² | | 0.357 | |
| F(sig) | | 42.91 (<0.001**) | |

**Significant at p≤0.001

*Significant at p≤0.05

Table 7. Effect of difficulty in evacuation on participants' lifestyle.

| | Frequency | Percent |
|--|-----------|---------|
| Has the difficulty of evacuation affected your lifestyle? | | |
| No | 505 | 53.8 |
| yes, with low effect | 271 | 28.9 |
| yes, with moderate effect | 126 | 13.4 |
| yes, with high effect | 37 | 3.9 |

Discussion

Constipation is a frequent functional gastrointestinal disorder. Globally, the prevalence of constipation in the general population is nearly 20% while it varies from 2% to 27%, depending on the definition used and population studied [14, 15]. A cross sectional study showed that the cumulative incidence of chronic constipation is higher among the elderly (20%) compared to a younger population (3). Severe constipation is more reported among elderly women, with two to three times higher rates than that of their male counterparts [16-18].

The current study aimed to assess the prevalence of constipation and its associated complications in Aseer region, Saudi Arabia, by using the Wexner Constipation Scoring System and to assess the most significant risk factors contributing to constipation in Aseer region. The study showed that a low level of constipation was prevalent among participants where Wexner constipation was 7.15 with a standard deviation of 5.0. This low score which indicates low incidence and constipation severity

was associated with reported daily life activities as more than half of the study participants do exercises, with one-third of them doing these exercises daily. In addition, the majority of participants (96.5%) eat foods that contain dietary fiber with different rates, while only one-third (32.7%) of them eat a little amount daily. As for water drinking, or unsweetened fruit juice consumed per day, the results showed that less than half of participants consumed 1-3 cups and one-third (31.7%) consumed 4-6 cups. Furthermore, about three-quarters (71.6%) of participants go directly to the bathroom when they feel the urge to evacuate. Almost 64% of them did not face any reason that led to a clear change in their daily routine. In India, a similar low prevalence of constipation was estimated where the prevalence of self-reported constipation within the last 1 year was 24.8% whereas 16.8% of participants had constipation according to the Rome II criteria [19]. A systematic review conducted by Schmidt FM et al [20], included 11 studies that revealed a prevalence of constipation that varied from 2.6% to 26.9%. The most frequently cited associated factors were female gender and advanced age, which were cited in 11 and 7 of the studies, respectively. Locally, a study conducted

in the central region population, Riyadh and Qassim provinces, Saudi Arabia [21], revealed that only 4.4% showed constipation clinical signs, whereas those whose result indicates no suffering from constipation represented 95.6%. Constipation is more prevalent among females (79.2%) than males (20.8%). Moreover, constipation is more severe among those who are between 20- and 35-years old.

Considering complications, the current study showed that feeling incomplete after evacuation" was a major complication. In addition, 32.9% and 31.9% of them suffered from hemorrhoids and anal fissure respectively as major complications. These findings were consistent with previously reported constipation related complications [22-24].

The study also showed that there were significant correlations between Wexner constipation score and age ($r=0.10$; $p<0.01$), marital ($r=0.08$; $p<0.05$) and employment status ($r=0.20$; $p<0.01$). In addition, all behaviors identified in this study were significantly correlated with Wexner constipation score except the "number of water glasses or unsweetened fruit juice consumed per day".

Conclusions and Recommendations

In conclusion, the current study showed that chronic constipation was not a common health problem among the study population with a higher severity score among old aged participants who were married and the working group. Since constipation is preventable and widely associated with risk factors, the decreasing of exposure to these risk factors contributes in prevention of developing constipation and of course its complications. Quitting smoking, daily exercise, controlling chronic diseases, eating plenty of foods with high fiber, fixation of routine as much as possible, are behaviors all strongly recommended, and significantly related to lower Wexner score i.e lower incidence of constipation. On the other hand, good dealing and management for constipation, and early intervention either in lifestyle modeling or in a pharmacological method will contribute to decreasing of developing constipation complications.

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