

## ORIGINAL ARTICLE

# Prevalence and Risk Factors of Umbilical Hernia among Female Patients Attending in A Tertiary Hospital

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## ABSTRACT

**Background:** An umbilical hernia occurs when abdominal contents bulge out at the navel, frequently observed in adult women because of pregnancy, obesity, or ongoing straining. Diagnosis is made clinically, imaging is used for confirmation if necessary, and surgical treatment is employed, as complications may arise if left unaddressed. This study seeks to fill the gap in gender-specific data among adults in Bangladesh. **Methods & Materials:** This cross-sectional research conducted at Shikder Women's Medical College Hospital (Jan–Dec 2025) involved 420 consenting women aged 18 years or older. Information regarding demographics, obstetric background, and risk factors was gathered through interviews and clinical assessments, including BMI measurement. Analysis employed SPSS-26 and Chi-square tests ( $p < 0.05$ ). Approval for ethical standards and the confidentiality of participants were guaranteed. **Results:** Among 420 women, most were 40–49 years (29.5%), rural residents (58.8%), and housewives (70.5%). Umbilical hernia was found in 14.8%. Common risk factors included heavy lifting, chronic constipation, obesity, prior abdominal surgery, and chronic cough. Hernia was significantly associated with obesity, heavy lifting, chronic cough, chronic constipation, and multiparity ( $\geq 3$  children), indicating these as key contributors in this population. **Conclusion:** Umbilical hernia impacted 14.8% of participants and showed a significant correlation with obesity, heavy lifting, chronic cough, chronic constipation, and multiparity, emphasizing the importance of modifiable and physiological risk factors in preventing it.

**Keywords:** Prevalence, Risk Factors, Umbilical Hernia, Female Patients, Tertiary Hospital

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## INTRODUCTION

A hernia is the unusual bulging of an organ or tissue through a weak spot or defect in the cavity wall that typically holds it, most often occurring in the abdominal area [1,2,3]. Hernias are classified by location inguinal, femoral, umbilical, epigastric, incisional [4].

An umbilical hernia is the protrusion of abdominal contents, such as intestine or omentum, through a weakness or defect in the abdominal wall at or near the umbilicus [5]. It accounts for 6–14% of hernias in the adult abdominal wall, with almost 90% being acquired [6,7]. It is prevalent, with roughly 175,000 surgical repairs each year in the U.S.; although frequently viewed as straightforward, they can become complicated and difficult if not handled correctly [8]. An umbilical hernia happens within 3 cm above or below the navel along the midline [4].

In females, the likelihood of umbilical hernia is heightened by factors such as pregnancy, obesity, ascites, chronic straining (e.g., heavy lifting, coughing), and connective tissue disorders that compromise the abdominal wall or elevate intra-abdominal pressure [9].

In adult females, an umbilical hernia typically appears as a swelling at the belly button, frequently accompanied by pain, discomfort, or pressure, intensifying with straining; if complications such as incarceration or strangulation arise, severe pain, tenderness, nausea, or vomiting might occur [10]. Umbilical hernia is diagnosed clinically by a bulge at the

umbilicus that may increase with straining; ultrasound or CT is used for confirmation or surgical planning [11].

Hernias are prevalent globally, and treatment has advanced with innovative methods. The majority of research centers on the effectiveness of techniques [12,13]. Treatment of umbilical hernias is primarily surgical, with mesh repair recommended for symptomatic hernias to reduce recurrence. Open mesh repair is standard, while laparoscopic repair is considered for larger defects or higher wound-risk patients [14].

A CT study from 2024 discovered that 67.6% of adults have umbilical hernias, frequently missed in clinical diagnoses, with larger hernias ( $\geq 10$  mm) being more prevalent in women [15]. Epidemiological studies indicate that umbilical hernias are more prevalent in females, primarily because of risk factors such as pregnancy and obesity, and that these hernias often occur in adults as a result of acquired weaknesses in the abdominal wall [16].

In research conducted in Tangail Sadar, Bangladesh, discovered that umbilical hernia was present in most of the calves studied, with factors like sex, breed, and age significantly linked to its occurrence [17]. Another study found that the recurrence rate of umbilical hernia in calves following herniorrhaphy was 8%, with factors such as surgical method, hernia dimension, and postoperative management associated with recurrence [18].

In Bangladesh, there is a lack of gender-specific information on umbilical hernia among adult females, even though both global

and local research exists regarding general hernias or studies on animal populations. This research intends to evaluate the prevalence and risk factors in female patients at a tertiary hospital to address this gap.

**METHODS & MATERIALS**

This study was a hospital-based cross-sectional study conducted at Shikder Women’s Medical College Hospital. The study was carried out over a one-year period from January 2025 to December 2025.

The study population included female patients aged 18 years and above attending the surgical outpatient and inpatient departments of the hospital during the study period. Women who provided informed consent were included, while those with previously repaired umbilical hernia, critically ill patients, or those unwilling to participate were excluded.

A total of 420 female patients were enrolled using a convenient sampling technique. Data were collected through face-to-face interviews using a structured questionnaire and clinical examination. The questionnaire included information on socio-demographic characteristics (age, residence, occupation), obstetric and reproductive history (parity, history of multiple pregnancy, mode of delivery), and potential risk factors such as obesity, chronic cough, chronic constipation, history of abdominal surgery, and heavy lifting habits.

Each participant underwent clinical examination by a qualified physician/surgeon to determine the presence or absence of umbilical hernia. Body Mass Index (BMI) was calculated from measured height and weight, with obesity defined as BMI  $\geq 30$  kg/m<sup>2</sup>.

Data were checked, coded, and analyzed using SPSS-26 software. Descriptive statistics (frequency, percentage) were used to summarize the data. The association between selected risk factors and umbilical hernia was assessed using the Chi-square test, with  $p < 0.05$  considered statistically significant.

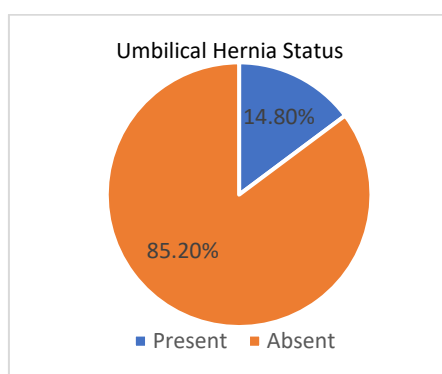
The study was conducted after obtaining ethical approval from the Institutional Ethical Review Committee, and written informed consent was obtained from all participants. Confidentiality and anonymity were strictly maintained throughout the study.

**RESULTS**

Table 1 presents the socio-demographic characteristics of the respondents. The largest proportion of participants belonged to the 40–49 years age group (29.5%), followed by 30–39 years (28.1%),  $\geq 50$  years (21.9%), and 18–29 years (20.5%). Regarding residence, the majority of respondents were from rural areas (58.8%), while 41.2% were from urban areas. In terms of occupation, most of the respondents were housewives (70.5%), followed by service holders (12.9%), day laborers (8.8%), and business or other occupations (7.8%).

**Table – I: Socio-demographic characteristics of the respondents (n = 420)**

Characteristics	Frequency	Percentage (%)
<b>Age group (years)</b>		
18–29	86	20.5
30–39	118	28.1
40–49	124	29.5
$\geq 50$	92	21.9
<b>Residence</b>		
Urban	173	41.2
Rural	247	58.8
<b>Occupation</b>		
Housewife	296	70.5
Service holder	54	12.9
Day laborer	37	8.8
Business/others	33	7.8



**Figure – 1: Prevalence of Umbilical Hernia among the respondents (n = 420)**

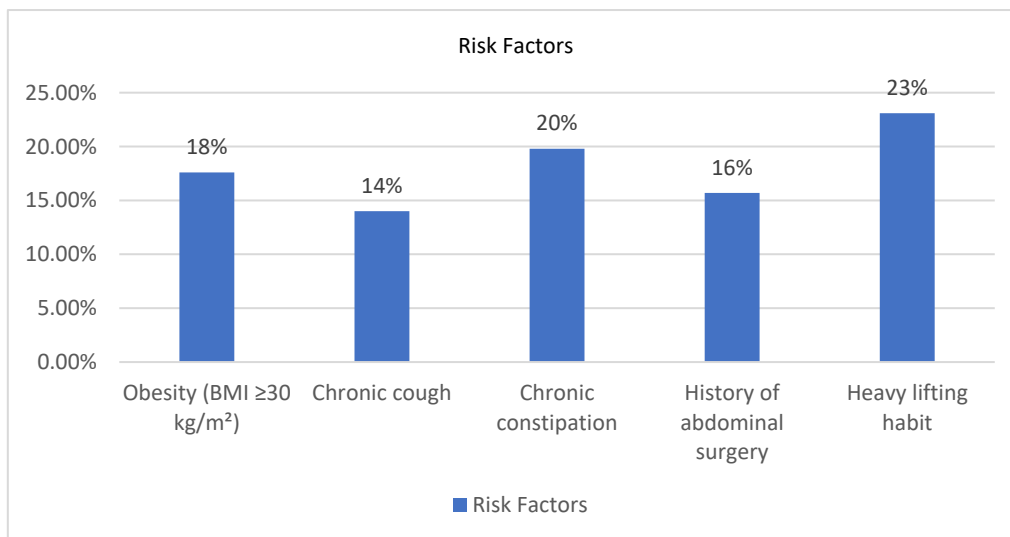
Figure 1 illustrates the prevalence of umbilical hernia among the study participants. Out of the total 420 female patients, 62 (14.8%) were diagnosed with umbilical hernia, whereas the remaining 358 (85.2%) had no evidence of the condition.

Table II shows the obstetric and reproductive characteristics of the respondents. The majority of participants had 1–2 children

(37.1%), followed by 3–4 children (35.0%), while 16.4% had five or more children and 11.4% were nulliparous. A history of multiple pregnancy was reported by 8.6% of respondents, while 91.4% had no such history. Among parous women, normal vaginal delivery was the most common mode of delivery (73.8%), whereas 26.2% had undergone caesarean section.

**Table - II: Obstetric and reproductive characteristics of respondents (n = 420)**

Characteristics	Frequency	Percentage (%)
<b>Parity</b>		
Nulliparous	48	11.4
1-2 children	156	37.1
3-4 children	147	35.0
≥5 children	69	16.4
<b>History of multiple pregnancy</b>		
Yes	36	8.6
No	384	91.4
<b>Mode of delivery (among parous)</b>		
Normal vaginal delivery	276	73.8
Caesarean section	98	26.2



**Figure - 2: Distribution of risk factors among study participants (n = 420)**

Figure 2 depicts the distribution of selected risk factors among the respondents. The most commonly reported risk factor was heavy lifting habit (23.1%), followed by chronic constipation (19.8%), obesity (17.6%), history of abdominal surgery (15.7%), and chronic cough (14.0%).

Table III demonstrates the association between selected risk factors and the presence of umbilical hernia. A significantly higher proportion of obese participants had umbilical hernia (33.9% vs 14.8%; p = 0.003). Similarly, chronic cough (24.2%

vs 12.3%; p = 0.021) and chronic constipation (30.6% vs 17.9%; p = 0.037) were significantly associated with the presence of umbilical hernia. Participants with a heavy lifting habit also showed a significantly higher prevalence of umbilical hernia (40.3% vs 20.1%; p = 0.002). In addition, multiparity (≥3 children) was significantly associated with the condition (61.3% vs 49.7%; p = 0.048). These findings indicate that obesity, heavy lifting, chronic cough, chronic constipation, and multiparity are important risk factors associated with umbilical hernia among the studied female population.

**Table - III: Association between selected risk factors and umbilical hernia (n = 420)**

Risk Factor	Umbilical Hernia Present (n=62), n (%)	Umbilical Hernia Absent (n=358), n (%)	p-value
Obesity	21 (33.9)	53 (14.8)	0.003
Chronic cough	15 (24.2)	44 (12.3)	0.021
Chronic constipation	19 (30.6)	64 (17.9)	0.037
Heavy lifting	25 (40.3)	72 (20.1)	0.002
Multiparity (≥3 children)	38 (61.3)	178 (49.7)	0.048

**DISCUSSION**

In this study, the majority of participants were between 40–49 years old. This corresponds with umbilical hernia patterns, which occur more frequently in those over 30 years old, reaching a high point of 31–40 in women and later in men, attributable to age-related weakening of the abdominal wall along with cumulative risk factors such as obesity and ongoing straining [16].

The majority of participants resided in rural regions compared to urban areas. Living in rural areas might heighten the risk of

hernias because of strenuous labor that elevates intra-abdominal pressure, a recognized factor in hernia formation [10].

A significant characteristic was the considerable number of housewives (70.5%), who might undergo continuous physical strain from household tasks and, in women, several pregnancies—both recognized to elevate intra-abdominal pressure and compromise the abdominal wall, thus increasing the likelihood of umbilical hernia [19].

14.8% of attendees were identified with umbilical hernia. These findings are consistent with earlier research, indicating that the condition is predominantly acquired, more prevalent among middle-aged women, and closely linked to pregnancy, obesity, and sustained elevations in abdominal pressure [9,10]. The majority of women had 1-2 children and some were childless. Increased parity correlates with a higher likelihood of ventral and umbilical hernias, as research indicates that women who have two or more births face a notably greater rate of hernia repairs, and the risk escalates with three or more pregnancies. The prevalence of normal vaginal deliveries highlights how repeated pregnancies and cumulative strain on the abdomen lead to the weakening of the abdominal wall [20]. The leading risk factors included heavy lifting, chronic constipation, obesity, previous abdominal surgery, and chronic cough. These elements elevate intra-abdominal pressure or impair the abdominal wall, facilitating the formation of hernias. Tackling changeable factors such as lifting methods, weight, constipation, and coughing might lower the risk of hernias [21,22].

In this study, umbilical hernia was significantly linked to obesity, heavy lifting, chronic cough, chronic constipation, and multiparity ( $\geq 3$  children). Obesity, heavy lifting, chronic cough, and constipation are established risk factors, while multiparity increases risk through abdominal wall stretching. Addressing these modifiable risks may help prevent umbilical hernia [23]. Overall, umbilical hernia in this population is primarily associated with age, female gender, multiparity, obesity, heavy lifting, chronic cough, and constipation, highlighting the role of modifiable factors in its prevention.

## CONCLUSION

The study found that umbilical hernia affected 14.8% of the female participants, with higher prevalence among middle-aged women, rural residents, and housewives. Key risk factors significantly associated with umbilical hernia included obesity, heavy lifting, chronic cough, chronic constipation, and multiparity ( $\geq 3$  children). These findings highlight that both physiological factors (age, parity) and modifiable lifestyle factors (lifting habits, weight management, bowel health, respiratory care) play important roles in the development of umbilical hernia, emphasizing the need for preventive strategies and health education.

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