

Mode of Delivery Preferences: Knowledge and Attitude among Female University Students: A Cross-Sectional Study

Ebtesam Ali Mohamed⁽¹⁾, Basma Mohamed Osman⁽²⁾, Momen Zakaria Mohamed Mohamed⁽³⁾,
Somaia Ragab Eid⁽⁴⁾, Eman Mahmoud Seif El –Nasr⁽⁵⁾

(1) Community Health Nursing, Faculty of Nursing- Beni-Suef University

(2) Community Health Nursing, Faculty of Nursing, Cairo University

(3) Obstetrics & Gynaecology, Faculty of Medicine, Beni - Suef University

(4) Maternal and Newborn Health Nursing, Faculty of Nursing, Beni-Suef University

(5) Community Health Nursing, Faculty of Nursing, Cairo University, Cairo 11562, Egypt. Misr University for Science and Technology, Giza, Egypt. emanseif@cu.edu.eg - <https://orcid.org/0009-0000-3382-3837>.

Abstract

Background: Egypt presents a particularly alarming scenario in the global caesarean section crisis, with rates that rank among the highest worldwide. Female university students are future mothers and healthcare professionals, and their knowledge and attitudes can influence future caesarean section rates. **Aim:** This study aims to assess female university students' preferences regarding mode of delivery, as well as their associated knowledge and attitudes, using a cross-sectional approach. **Methods:** A cross-sectional study was conducted with 700 female students from Beni-Suef University, Egypt, using a stratified random sample. Data were collected via an online questionnaire covering personal characteristics, preferred mode and place of delivery, knowledge assessment questionnaire, and attitude scale. **Results:** The majority of participants (86.5%) identified CS as the most common mode of delivery, while 62% preferred vaginal delivery. Knowledge levels were moderate for 47.7% of participants. Nearly evenly split attitudes toward VD (51.86% positive, 48.14% negative), while attitudes toward caesarean section were predominantly neutral (71.6%). Age, education type, family income, and maternal education significantly influenced attitudes. A positive correlation emerged between knowledge and attitude scores. **Conclusion:** The study reveals moderate knowledge and mixed attitudes toward modes of delivery, with a slight preference for VD. The correlation between knowledge and attitudes suggests that enhancing knowledge could foster more favourable attitudes toward specific modes of delivery.

Keywords: Female University Students, knowledge, Attitude, modes of delivery.

Introduction

Childbirth represents a profound and transformative life event for women worldwide, yet the decision regarding mode of delivery has become increasingly complex in contemporary healthcare systems. Over the past three decades, cesarean section (CS) rates have increased dramatically across both developed and developing countries, rising from approximately 7% in 1990 to 21.1% in 2015, with projections indicating a global rate of 28.5% by 2030 (Betrán et al., 2021). This escalation substantially exceeds the World Health Organization's recommended optimal CS rate of 10-15%, raising significant public health concerns about the overuse of surgical delivery and its associated maternal and neonatal complications (Jawa et al., 2023; World Health Organization, 2019).

In middle-income countries, including Egypt, CS rates have demonstrated marked

increases, reflecting a global shift in childbirth practices that warrants comprehensive investigation (Yassin et al., 2024). The rapid escalation from 4.6% in 1992 to current levels above 50% represents one of the most dramatic increases in cesarean section rates documented globally, placing Egypt alongside countries like Iran and Turkey as having the highest CS rates in the Middle East and North Africa (MENA) region (McCall et al., 2021; Dadipoor et al., 2020).

The escalating CS rates have been attributed to multiple interrelated factors, including both clinical and non-clinical determinants. While medical indications constitute legitimate reasons for surgical delivery (Senanayake et al., 2022), a growing proportion of cesarean sections globally are performed without clear medical necessity (Jawa et al., 2023; Sadek, Ibrahim & Elsharkawy, 2021). Non-clinical factors, including differences in healthcare provider practices, fear of malpractice litigation,

organizational structures, economic incentives, and socio-cultural influences, have been identified as significant contributors to the rising rates. Among these factors, women's preferences, attitudes, and knowledge regarding childbirth emerge as critical yet understudied elements that influence delivery mode decisions (Muhandule et al., 2024; Bam et al., 2021; Kingdon et al., 2021).

Female university students represent a strategically important population for understanding and shaping future maternal health outcomes. As educated young women, they constitute the next generation of mothers and healthcare decision-makers who will influence Egypt's maternal health landscape. Research demonstrates that attitudes and preferences toward childbirth are formed early in the reproductive life course, often before pregnancy, through family narratives, media exposure, peer influences, and educational experiences (Arundell et al., 2024). Studies conducted across multiple countries have revealed that university students' attitudes toward childbirth are shaped primarily by family narratives (approximately 50% of female students) and media representations (22-34%), rather than evidence-based healthcare information (Arundell et al., 2024). These sources of information often perpetuate misconceptions about childbirth safety, pain, and delivery outcomes, potentially contributing to increased preference for cesarean section among some young women (Saraf & Bagga, 2022).

Despite, University students are at a critical developmental stage where evidence-based education can shape positive beliefs about childbirth, correct misconceptions, and promote informed decision-making skills that will influence their future reproductive choices (Arundell et al., 2024; Stoll & Hall, 2021). Previous research indicates that knowledge gaps persist among university-aged women with respect to the risks and benefits of different delivery methods. Misconceptions about caesarean section, its safety, indications, and long-term consequences can shape attitudes and, ultimately, preferences for surgical delivery (Gresz, 2024).

Community health nurses are essential in assessing university students' knowledge and

attitudes about modes of delivery—normal vaginal birth and cesarean section—and implementing health education to raise awareness (Patel & Chouhan, 2024). Through structured knowledge, attitude assessments, nurses identify misconceptions and knowledge deficits regarding childbirth options, complications, and evidence-based delivery practices (Ukoha et al., 2019; Yaqoub & Hussein, 2022).

Significance of Study

Recent data confirm that Egypt maintains the third-highest cesarean section rate globally, with national rates reaching approximately 52-57.3% (McCall et al., 2021). Recent governmental initiatives led to a 61% decline in unnecessary caesarean sections in Ministry of Health hospitals during the early months of 2023 (Ministry of Health and Population, 2023). Despite these gains, rates of surgical deliveries remain persistently high within the private sector, with governorates such as Port Said, Kafr El-Sheikh, and Al-Gharbiya demonstrating disproportionately elevated caesarean rates. Studies conducted between 2023 and 2024 continue to document persistently elevated CS rates, with some tertiary care centers reporting rates exceeding 54%, indicating that this public health crisis remains unabated (Wahdan et al., 2022).

Assessing university students' delivery mode knowledge is critical, as 70.4% of Egyptian pregnant women fear childbirth, potentially driving high cesarean rates (Elsharkawy et al., 2024). Recent large-scale studies conducted among Egyptian medical students reveal substantial gaps in knowledge that extend beyond basic reproductive health and encompass more complex maternal health topics. For example, Wahdan et al., (2022) found that although over half of the students (54.72%) achieved top academic grades, the majority (85.9%) demonstrated limited understanding of childbirth methods, and nearly one-third (32.5%) reported relying mainly on social media as their primary source for reproductive health information.

This study significantly advances the evidence base for community health nursing practice and research. Regarding practice implications, findings demonstrate nurses' multidimensional roles as health educators, patient advocates, and

interdisciplinary collaborators who operationalize evidence-based interventions and mitigate social determinants of health, thereby improving outcomes among vulnerable and underserved populations (Khairwar, 2024). Concerning research implications, results help to identify critical knowledge gaps warranting systematic inquiry into service-learning frameworks and participatory community engagement methodologies that enhance nursing workforce competencies and address training insufficiencies essential for confronting contemporary population health challenges (Emrani et al., 2024).

Mode of Delivery: The method by which a baby is delivered, specifically vaginal delivery (VD) or caesarean section (CS).

The aim of the study

This study aims to assess female university students' preferences regarding mode of delivery, as well as their associated knowledge and attitudes, using a cross-sectional approach.

Research Questions:

The present study addresses the following research questions:

1. What are the preferences of female university students regarding mode and place of delivery?
2. What are the levels of knowledge among female university students about modes of delivery?
3. What are the attitudes of female university students toward vaginal delivery and caesarean section?
4. What is the relationship between female university students' demographic characteristics and their knowledge and attitudes toward modes of delivery?
5. Is there a correlation between female university students' knowledge and attitudes toward modes of delivery?

Subjects and Method

Research design: A cross-sectional study design was used in the study. A cross-sectional study design was utilized in this research, enabling the collection of data from participants at a single point in time to assess

their knowledge and attitudes related to mode of delivery. This design is commonly employed in maternal health investigations in Egypt, as it efficiently identifies prevailing trends and associations within specific populations (Mohammed, Zaky, & Hany, 2024).

Setting: The study was conducted at Beni-Suef University, one of Egypt's largest public universities, located approximately 120 km south of Cairo. Established as an independent institution in 2005 after previously being a branch of Cairo University, Beni-Suef University has grown substantially and currently encompasses 33 faculties offering a broad range of academic programs. The university enrolls over 50,000 students across diverse faculties including commerce, law, medicine, nursing, engineering, and arts, attracting students from various socioeconomic backgrounds. The university was selected as the study setting due to its accessibility and its large, diverse female student population, which provides a comprehensive representation for studying knowledge and attitudes toward maternal health and mode of delivery across different societal strata (Beni-Suef University profile, 2023).

Sample size: A stratified random sample of 700 female university students (140 medical, 560 non-medical) was selected. The minimum sample size was calculated to be 424 students (85 medical, 339 non-medical) using the formula: $n = Z^2 P(1-P) / d^2$ Where:

n = sample size

$Z = 1.96$ (95% confidence level)

$P = 0.5$ (expected proportion)

$d = 0.05$ (precision)

The sample was divided based on the ratio of medical (5,000) to non-medical (20,000) students. Exclusion Criteria: Female students under 18 years and those with personal childbirth experience.

Tools of data collection: A comprehensive structured questionnaire was developed following extensive literature review and expert validation, comprising four distinct sections:

Section 1: Sociodemographic characteristics including age, residence, educational type (medical/non-medical), parental education levels, and family income status.

Section 2: Mode of delivery preferences and background information, including preferred mode and place of delivery, and information sources.

Section 3: Students Knowledge regarding mode of delivery questionnaire: A 16-item knowledge questionnaire was developed by the researchers after a comprehensive review of related literature (Heidari & Kohan, 2015; Zayed, El Kelany, & Alkalash, 2021 & Puspitasari, Wahyuni, & Rakhmawati, 2023). Items and scoring thresholds were adapted from prior maternal health knowledge, attitude, and practice (KAP) instruments to ensure content validity and interpretability in similar populations. Participants' responses were recorded on a three-point scale: "yes" was scored 2, "no" was scored 1, and "don't know" was scored 0. The overall possible score ranged from 0 to 16. Knowledge levels were classified using established percentage-based criteria that are commonly employed in maternal health knowledge surveys: scores of 66% or higher (approximately 10.6–16 points) indicated high knowledge, scores between 50% and 65% (8–10.5 points) reflected moderate knowledge, and scores below 50% (less than 8 points) signified low knowledge.

Section 4: Students Attitude regarding mode of delivery scale: A 22-item attitude scale (11 items each for V D and Cesarean Section) was developed by the researchers based on an integrative review of validated tools assessing childbirth attitudes among students and women in diverse settings, ensuring cultural and contextual relevance (Stoll et al., 2019; Clemons et al., 2022; González-Mesa et al., 2023).

Items were measured on a three-point Likert-type scale: "agree" (3), "neutral" (2), and "disagree" (1), aligning with standard attitude measurement approaches and guidance for Likert-type data (Likert, 1932; Sullivan & Artino, 2013). For each delivery mode, attitude scores ranged from 11–33 and were classified using percentage-based thresholds commonly used in maternal health attitude research: positive attitude $\geq 70\%$ (23–33), neutral 50–69% (16.5–22.9), and negative $< 50\%$ (< 16.5)

(Stoll et al., 2019; Varnakioti, Sarantaki, Gourounti, & Lykeridou, 2022). Content validity was supported through literature grounding and expert review, while scoring rules were harmonized with prior instruments to facilitate comparability across studies (Heidari & Kohan, 2015; González-Mesa et al., 2023).

Validity & Reliability: Content validity was ensured through rigorous review by a panel of five experts: two specialists in community health nursing, two in maternal and newborn health nursing, and one obstetrician. The questionnaire was revised according to their feedback to enhance clarity and relevance. To evaluate internal consistency, Cronbach's alpha was used, resulting in coefficients of 0.75 for the knowledge survey and 0.72 for the attitude scale both exceeding the widely accepted minimum standard of 0.70.

Ethical considerations:

This study received prior approval from the Scientific Research Ethical Committee at the Faculty of Medicine, Beni-Suef University (Approval No. FMBSURE/06062023) before data collection. All procedures complied with the Declaration of Helsinki and Egyptian national research ethics guidelines (World Medical Association, 2024; Ministry of Health and Population, 2016). Electronic written informed consent was obtained from all participants after reviewing a detailed information sheet outlining study aims, voluntary participation, withdrawal rights, confidentiality assurances, and investigator contact details. Anonymity was ensured by excluding personally identifying information, storing data on password-protected servers accessible only to the research team, reporting results in aggregate form, and following institutional data retention protocols.

Data Collection Procedure:

Data was collected from June 10 to September 3, 2023, utilizing a secure online survey platform (Google Forms) to maintain both participant anonymity and robust data security. The online format was selected due to its cost-effectiveness, its potential to reach a large and diverse sample, and because it aligns

with the digital proficiency of university students.

Participants were recruited using several channels to optimize response rates: invitations were distributed via the university's official email system, posted on electronic notice boards within faculty buildings, shared through student organization social media accounts, and announced during classroom lectures with instructor approval. Each recruitment message included comprehensive study information, eligibility requirements, an estimated survey completion time (15–20 minutes), and a direct link to the online survey. To further enhance participation, several best practices were implemented: the survey design was kept clear and concise, mobile compatibility was prioritized, progress bars were added to inform respondents of their status, two reminder emails were sent at one-week intervals, and the significance of the research for maternal health education was explicitly emphasized.

Statistical Design:

Descriptive statistics (frequencies, percentages, means, and standard deviations) to summarize participant characteristics, preferences, knowledge, and attitudes. Chi-square tests to examine associations between categorical variables (demographics and knowledge/attitude levels). Pearson correlation coefficients to assess relationships between continuous variables (knowledge and attitude scores). Statistical significance set at $p < 0.05$.

Results:

Table 1 indicates that 47.7% of the female university students in the study are aged between 20 and 22 years. While 76.6% reside in rural areas and 71.6% are enrolled in non-medical faculties. Regarding parental education, 43.3% of fathers and 42.4% of mothers have completed secondary education, while 1.4% have attained postgraduate studies. In terms of socioeconomic status, 72.7% of the students reported that their family income is sufficient to meet basic needs, and 10.6%.

Table 2 shows that a substantial majority (84.3%) of university students reported being born via vaginal delivery, while 86.6% perceive CS. Interestingly, 77% of students indicated that they would personally prefer vaginal delivery for

future deliveries. Additionally, an overwhelming proportion (97%) expressed a preference for having a doctor attend their future birth.

Figure 1 illustrates that less than half (49%) of university students surveyed expressed a preference to have one or two children in the future, while only a small fraction (3%) indicated a desire for five or more children.

Figure 2 reveals that 64.4% of university students indicated a preference for giving birth in private hospitals, whereas 12.3% preferred general hospitals for childbirth.

Figure 3 indicates that 87.3% of university students receive information about modes of delivery from family experiences. Additionally, 73.3% obtain such information from social media, while 51% rely on the experiences of their friends.

Table 3 reveals that 66.7% of university students responded “yes” to the statement asserting that the risk of bleeding following a vaginal delivery is greater than after a caesarean section. Fifty six percent of students agreed that vaginal delivery is possible after a previous caesarean section. However, 55.7% indicated they “don’t know” whether the risk of developing placenta previa in future pregnancies is higher after a caesarean section than following a normal delivery. Additionally, 39.1% were unsure about whether a caesarean section can be performed alongside tubal ligation for permanent birth control purposes. These findings highlight notable gaps in students’ knowledge regarding important obstetric risks and procedures.

Figure 4 clarifies that 47.7% of university students possess moderate knowledge about childbirth methods, while 32.4% have low knowledge. In contrast, 19.9% demonstrate high knowledge in this area.

Table 4 demonstrates that 91.6% of the studied university students perceive vaginal delivery as a natural and inherent process, while 85.7% agree that the absence of personal support during labor can lead to increased fear of normal delivery. Conversely, 37.7% disagree with the notion that vaginal delivery may impact on marital relationships, and 75.7% do not support the view that choosing vaginal delivery is primarily motivated by a desire to avoid surgery or caesarean scarring.

Figure 5 shows that 88.6% of university students surveyed hold a positive attitude toward vaginal delivery, while 11.4% express a negative attitude.

Table 5 indicates that most university students (84.7% and 91.4%) agreed that caesarean section leads to sagging and weakness of the abdominal muscles and that it has become the common mode of delivery in private healthcare sectors across many countries, respectively. Conversely, a large proportion (81.3% and 78.4%) of the students disagreed with the statements suggesting that they chose caesarean section because wealthy women do so, and that recovery after caesarean section is faster and less painful, respectively.

Figure 6 shows that 70.6% of university students hold a neutral attitude toward caesarean section, while 27% express a positive attitude and 1.4% have a negative attitude. This distribution highlights a predominance of neutral perspectives regarding caesarean delivery among university students, with a minority leaning positively or negatively.

Table 6 reveals a statistically significant association between the type of faculty attended by students and their overall knowledge level, as well as between their mothers' level of education and their total knowledge score. In contrast, no statistically significant differences were found between students' age, place of residence, or family income and their overall knowledge level. These findings suggest that academic setting and maternal education play key roles in shaping students' knowledge, whereas demographic and socioeconomic factors exert minimal influence.

Table 7 shows a statistically significant association between students' age and their mothers' educational level and students' overall attitude toward vaginal delivery. However, factors such as students' residence, faculty type, and family income do not show a statistically significant relationship with their attitudes regarding vaginal delivery. This suggests that personal background, especially age and maternal education, plays a greater role in shaping attitudes toward childbirth than academic or socioeconomic factors.

Table 8 demonstrates a statistically significant association between students' age and family income and their overall attitude toward caesarean section. On the other hand, no statistically significant relationships were observed between students' residence, faculty type, or mothers' educational level and their attitude toward caesarean section. This indicates that both age and financial status have a meaningful influence on students' perceptions about caesarean delivery, while other demographic and academic factors do not appear to have a significant impact.

Table 9 demonstrates a strong, statistically significant positive correlation between students' total knowledge scores and their total attitude scores toward normal birth ($r = 0.73$, $p = 0.0001$). Additionally, there is a significant positive correlation between the total attitude scores toward normal birth and those toward caesarean birth ($r = 0.62$, $p = 0.001$). These findings suggest that as students' knowledge about childbirth increases, their attitudes toward both vaginal and caesarean deliveries become more positive.

Table (1): Sociodemographic Characteristics of Female University Students (n=700).

Sociodemographic characteristics	N	%
Age		
17-19 years old	317	45.3
20-22 years old	334	47.7
23-25 years old	49	7
Residence		
Rural	536	76.6
Urban	164	23.4
Type of faculty		
Non-medical faculty	501	71.6
Medical faculty	199	28.4
Fathers educational level		
Not read and write	43	6.1
Read and write	82	11.7
Basic education	61	8.7
Secondary education	303	43.3
High education	188	26.9
Post graduation studies	23	3.3
Mother educational level		
Not read and write	126	18
Read and write	59	8.4
Basic education	53	7.6
Secondary education	297	42.4
High education	155	22.1
Post graduation studies	10	1.4
Income		
Not Enough	117	16.7
Enough	509	72.7
Enough and save	74	10.6

Table (2): Distribution of Female University Students regarding Preferred Mode of Delivery (n=700).

Items	N	%
Mode of delivery in which you were born		
Vaginal delivery	590	84.3
Caesarean section	110	15.7
The most common mode of delivery, in your opinion		
Vaginal delivery	94	13.4
Caesarean section	606	86.6
Which mode of delivery will you prefer in the future?		
Vaginal delivery	539	77
Caesarean section	161	23
Who would prefer to give birth to you in the future?		
Midwife	7	1
Doctor	679	97
Nurse	14	2

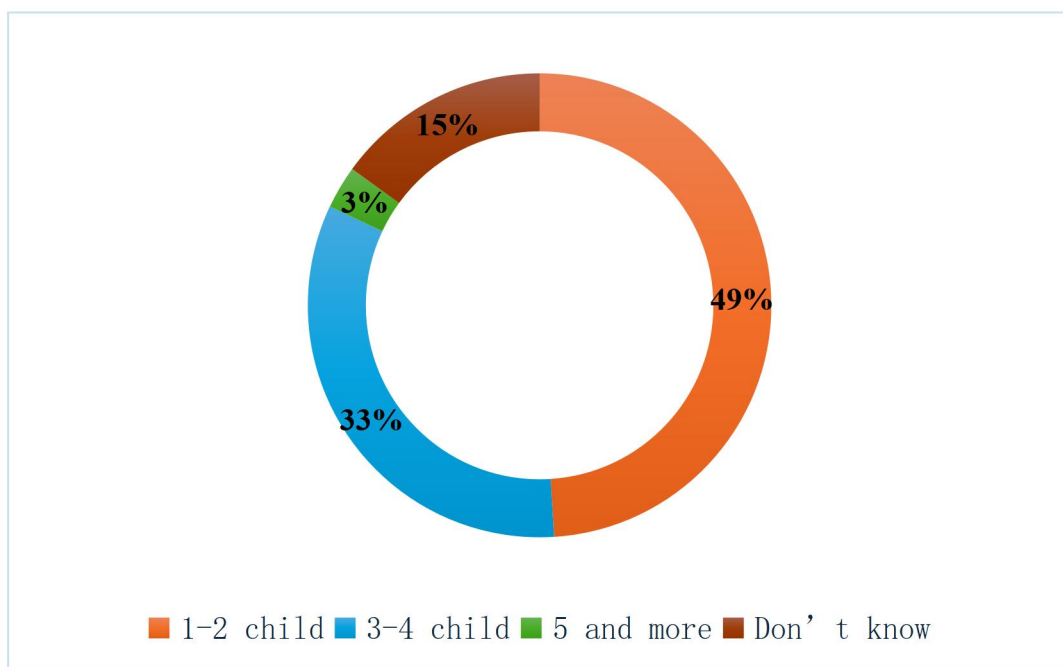


Figure (1): Distribution of Female University Students regarding their Preferred Number of Children for the Future (n=700).

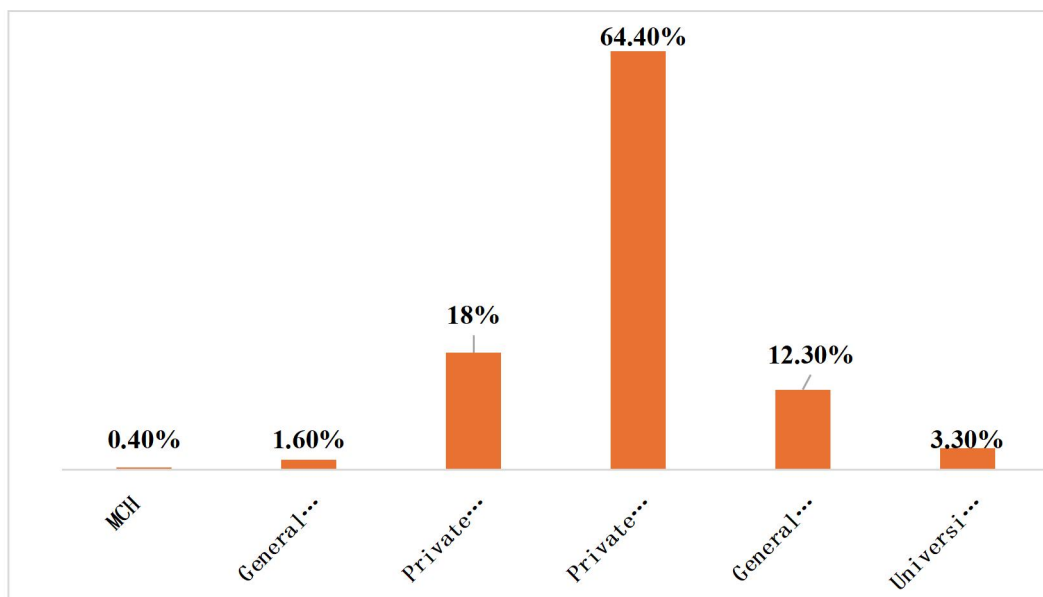


Figure (2): Distribution of Female University Students regarding their Preferred Place for Childbirth

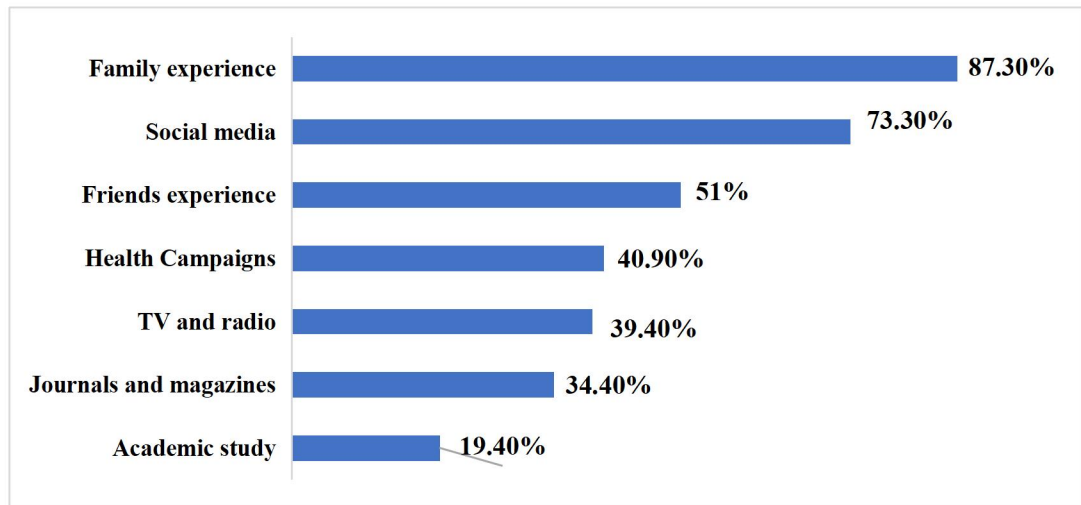


Figure (3): Distribution of Female University Students regarding Source of Information (n=700).

Table (3): Distribution of the Female University Students according to their Knowledge regarding Mode of Delivery (n=700).

knowledge items	Yes		No		Don't know	
	N	%	N	%	N	%
Postpartum bleeding risk is higher after CS than VD.	288	41.1	252	36	160	22.9
Maternal bacterial infection risk is higher following CS than VD.	467	66.7	131	18.7	14.6	102
Blood clot risk in veins is higher following CS than VD.	118	16.9	338	48.3	244	34.9
Neonatal respiratory problems after CS are less than after VD.	246	35.1	257	36.7	197	28.1
VD is possible after previous CS.	392	56	226	32.3	82	11.7
Placenta previa risk in future pregnancies is higher after CS than VD.	231	33	79	11.3	390	55.7
CS may impact a woman's fertility.	130	18.6	417	59.6	153	21.9
CS can be combined with tubal ligation for permanent birth control.	181	25.9	245	35	274	39.1

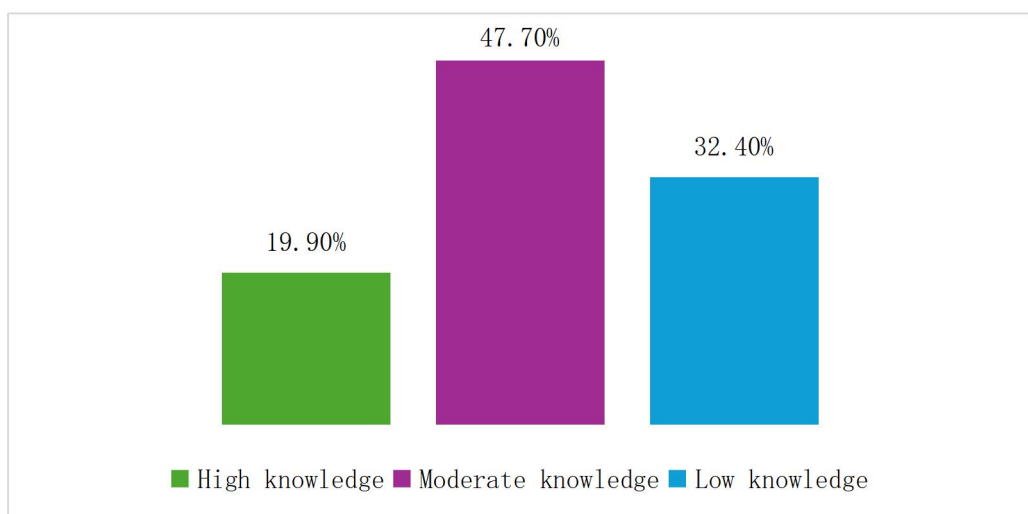


Figure (4): Distribution of Female University Students according to their Total Knowledge Level regarding Mode of Delivery (n=700).

Table (4): Distribution of the Female University Students according to their Attitude regarding Vaginal Delivery.

Attitude items	Agree		Neutral		Don't agree	
	N	%	N	%	N	%
VD strengthens the mother-child emotional bond.	514	73.4	95	13.6	91	13
VD carries lower disease and morbidity risks than CS.	428	61.1	123	17.6	149	21.3
VD is a natural, innate process.	641	91.6	30	4.3	29	4.1
Immediate newborn contact after VD provides profound maternal joy and satisfaction.	654	93.4	32	4.6	14	2
VD poses greater complication and maternal death risks than CS.	325	46.4	108	15.4	267	38.1
VD is preferred to avoid CS anesthesia risks.	571	81.6	52	7.4	77	11
VD involves severe labour pain and stress.	506	72.3	127	18.1	67	9.6
Inadequate delivery room support fosters fear of VD.	600	85.7	59	8.4	41	5.9
VD may impact marital relationships.	182	26	254	36.3	264	37.7
VD best preserves body image.	93	13.3	77	11	530	75.7
I prefer VD to avoid surgery and CS scarring.	562	80.3	50	7.1	88	12.6

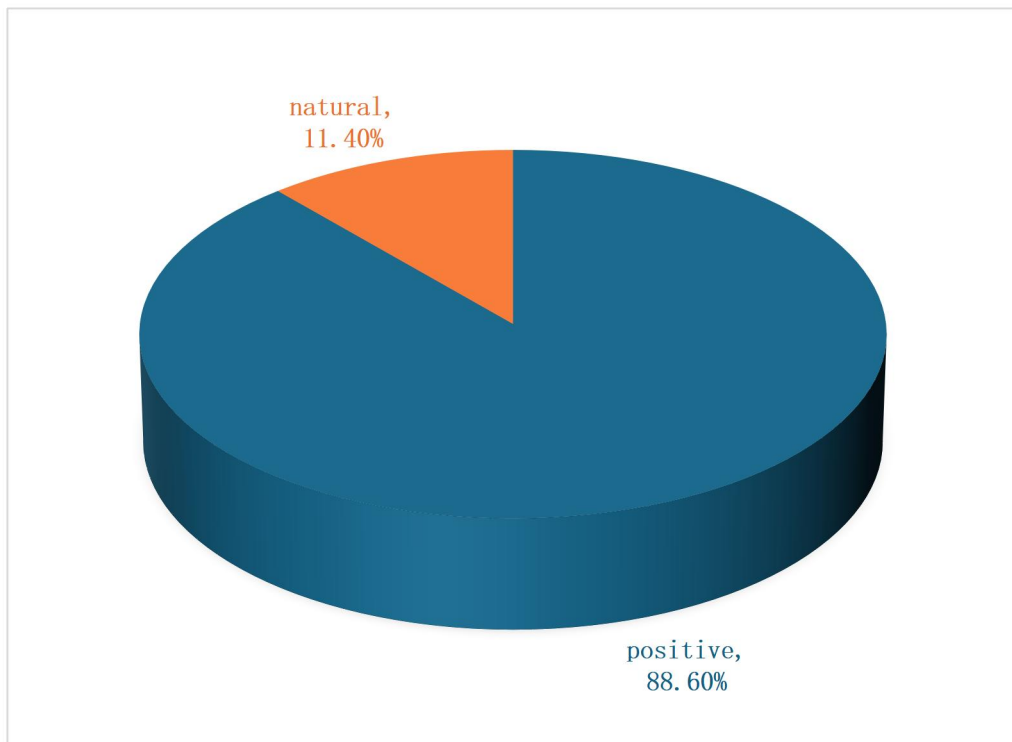
**Figure (5):** Distribution of Female University Students regarding Total Attitude Level toward Vaginal Delivery (n=700).

Table (5): Distribution of Female University Students according to their Attitude regarding Caesarean Section (n=700).

Attitude items	Agree		Neutral		Don't agree	
	N	%	N	%	N	%
CS can weaken and sag abdominal muscles.	593	84.7	54	7.7	53	7.6
CS lowers fetal injury and death risk in emergencies.	510	72.9	97	13.9	93	13.3
CS is increasingly standard in private healthcare.	640	91.4	39	5.6	21	3
Financially constrained individuals may prefer CS.	30	4.3	58	8.3	612	87.4
Hospital stay is longer for CS than VD.	587	83.9	48	6.9	65	9.3
CS is viewed as a modern childbirth option over VD.	341	48.7	42	6	317	45.3
CS is painless.	205	29.3	61	8.7	434	62
I chose CS because affluent women prefer it.	73	10.4	58	8.3	569	81.3
CS can preserve marital harmony.	123	17.6	246	35.1	331	47.3
Recovery is faster and less painful after CS.	66	9.4	85	12.1	549	78.4
CS prevents neonatal death.	228	32.6	193	27.6	279	39.9

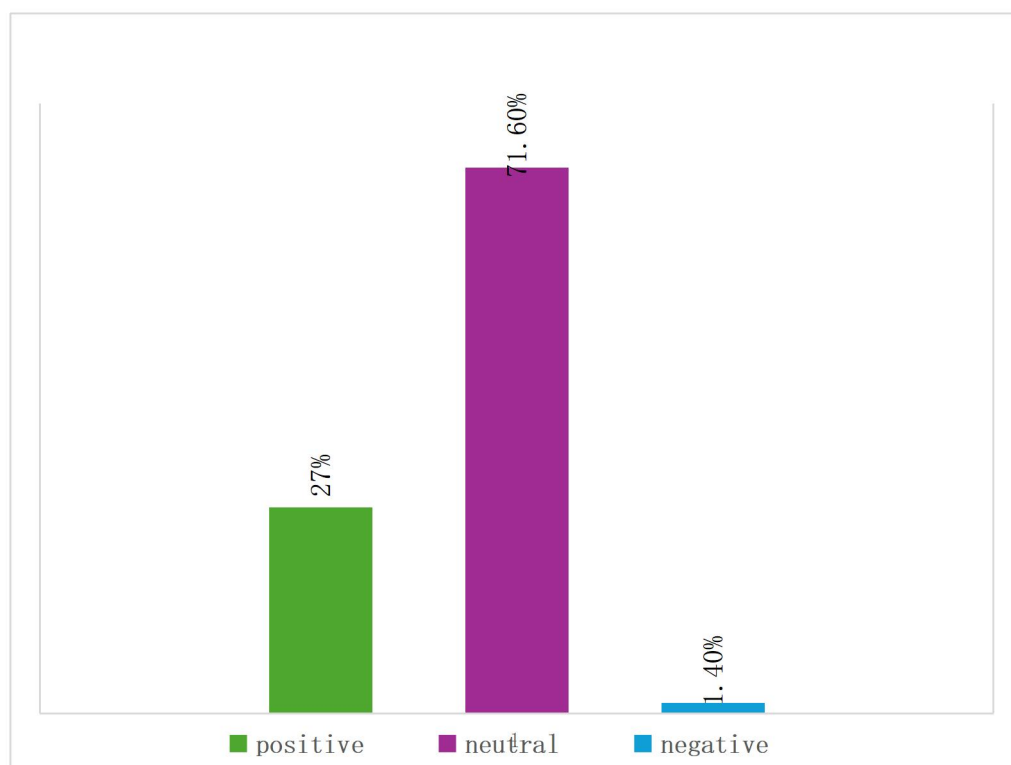
**Figure (6):** Distribution of the Female University Students according to their Total Attitude Level regarding Caesarean Section (n=700).

Table (6): Relationship between Female University Student's Demographic Characteristics and their Total Knowledge Level (n=700).

Demographic characteristic	N	Total knowledge level						X ²	P - value
		Good		Fair		Poor			
		N	%	N	%	N	%		
Age									
17-19 years old	317	52	7.4	155	22.1	110	15.7	4.57	0.334
20-22 years old	334	76	10.9	156	22.3	102	14.6		
23-25 years old	49	11		23	3.3	15	2.1		
Residence									
Rural	536	111	15.9	262	37.4	163	23.3	4.36	0.113
Urban	164	28	4	72	10.3	64	9.1		
Type of Faculty									
Medical faculty	401	122	17.4	261	37.3	118	16.9	67.83	0.000*
Non-medical faculty	299	17	2.4	73	10.4	109	15.6		
Mothers' educational level									
Not read and write	126	29	4.1	61	8.7	36	5.1	5.76	0.02*
Read and write	59	9	1.3	28	4	22	3.1		
Basic education	53	9	1.3	25	3.6	19	2.7		
Secondary education	297	60	8.6	144	20.6	93	13.3		
High education	155	32	4.6	70	10	53	7.6		
Post graduation studies	10	0	0	6	0.9	4	0.6		
Income									
Enough to cover basic needs	509	106	15.1	238	34	165	23.6	1.95	0.745
Not enough to cover basic needs	117	21	3	56	8	40	5.7		
Enough and save	74	12	1.7	40	5.7	22	3.1		

(*) Statistically significant $p < 0.05$, (X²) Chi-square test**Table (7):** Relationship between the Female University Student's Demographic Characteristics and their Attitude toward Vaginal Delivery (n=700).

Demographic characteristic	N	Total attitude level				X ²	P - value
		Positive		Neutral			
		N	%	N	%		
Age							
17-19 years old	317	282	40.3	35	5	6.44	0.04*
20-22 years old	334	300	42.9	34	4.9		
23-25 years old	49	38	5.4	11	1.6		
Residence							
Rural	536	471	67.3	65	9.3	1.1	0.294
Urban	164	149	21.3	15	2.1		
Type of Faculty							
Medical faculty	401	201	28.7	200	28.6	.038	0.845
Non-medical faculty	299	199	28.4	100	14.3		
Mothers' educational level							
Not read and write	126	110	15.7	16	2.3	10.05	0.03*
Read and write	59	56	8	3	0.4		
Basic education	53	42	11	53	7.6		
Secondary education	297	261	37.3	36	5.1		
High education	155	143	20.4	12	1.7		
Post graduation studies	10	8	1.1	2	0.3		
Family Income							
Enough to cover basic needs	509	454	64.9	55	7.9	.737	.692
Not enough to cover basic needs	117	102	14.6	15	2.1		
Enough and save	74	64	9.1	10	1.4		

(*) Statistically significant $p < 0.05$, (X²) Chi-square test

Table (8): Relationship between the Female University Student's Demographic Characteristics and Their Attitude toward Caesarean Section

Demographic characteristic	N	Total attitude level						X ²	P- value
		Positive		Neutral		Negative			
		N	%	N	%	N	%		
Age									
17-19 years old	317	101	14.4	212	30.3	4	0.6	9.38	0.02*
20-22 years old	334	80	11.4	248	35.4	6	0.9		
23-25 years old	49	8	1.1	41	5.9	0	0		
Residence									
Rural	536	144	20.6	383	54.7	9	1.3	1.03	0.599
Urban	164	45	6.4	118	16.9	1	0.1		
Faculty									
Medical faculty	401	325	46.4	25	3.6	51	7.3	1.44	0.487
Non-medical faculty	299	200	28.6	51	7.3	48	6.8		
Mothers' educational level									
Not read and write	126	28	4	96	13.7	2	0.3	11.76	0.302
Read and write	59	23	3.3	36	5.1	0	0		
Basic education	53	12	1.7	41	5.9	0	0		
Secondary education	297	88	12.6	205	29.3	4	0.6		
High education	155	35	5	116	16.6	4	0.6		
Post graduation studies	10	3	0.4	7	1	0	0		
Income									
Enough to cover basic needs	509	143	20.4	361	51.6	5	0.7	10.55	0.032*
Not enough to cover basic needs	117	27	3.9	89	12.7	1	0.1		
Enough and save	74	19	2.7	51	7.3	4	0.6		

(*) Statistically significant $p < 0.05$, (X²) Chi-square test

Table (9): Correlations between the Female University Students' Knowledge and Attitude towards Vaginal Delivery and Caesarean Section (n=700).

Item		Total knowledge score	Total attitude score towards normal birth	Total attitude score towards CS birth
Total knowledge score	r	1	0.73	0.024
	P- value	-	0.000 **	0.526
Total attitude score towards normal birth	r	0.73	1	0.62
	P- value	0.000 **	-	0.001**
Total attitude score towards CS birth	r	0.024	0.62	1
	P- value	0.526	0.001**	-

(**) statistically significant, (r) Pearson correlation coefficient

Discussion

Global caesarean section rates continue to rise, with projections estimating approximately 38 million CS deliveries annually by 2030, of which around 33.5 million will occur in low- and middle-income countries. This increase reflects both medically necessary procedures and those performed without clinical indications, often at maternal request. The growing preference for CS

emphasizes the importance of understanding the perspectives of future mothers and healthcare providers. For community health nurses, such insight is vital in designing targeted health education and intervention programs aimed at promoting safe delivery practices and improving maternal and neonatal outcomes.

The age distribution indicates that nearly half of the students were between 20 and 22 years old,

demonstrating that most participants were in early adulthood consistent with the typical age range for undergraduate students in Egypt. Regarding residence, more than three quarters of the sample came from rural areas, which may reflect the rural composition of public university catchment zones in Egypt, where access to higher education has expanded beyond urban centers. In terms of academic background, over two thirds of the students were enrolled in non-medical faculties. Parental education patterns revealed that fathers were more likely than mothers to have attained higher education. Financially, approximately three quarters of the participants reported that their income was sufficient to meet daily needs, whereas about one fifth considered it insufficient. Overall, the sociodemographic profile of the study reflects a relatively homogenous, young, rural, and middle-income student population, with notable variations in parental education and faculty type. These characteristics are essential for interpreting students' knowledge and attitudes toward childbirth, as sociodemographic backgrounds often influence their access to health information, beliefs, and preferences.

The present study found that most university students were born through VD, a proportion higher than that reported in earlier research. Saraf and Bagga (2022) documented that 68% of first year and 75.4% of final-year medical students were born via VD, compared to 32% and 24.6% of these respective groups born through CS. Similarly, Mete and Alparslan (2018) investigated delivery type preferences among Turkish university students and noted that over half were born vaginally. These consistent findings demonstrate that VD remains a predominant birth method among university students, potentially influencing their perceptions and future preferences regarding childbirth methods.

This study found that most participants preferred VD as their ideal mode of childbirth. Similar trends have been observed in previous research. Clemons et al. (2022), Saraf and Bagga (2022), Varnakioti et al. (2021), and Mete and Alparslan (2018) all reported that the majority favored vaginal birth, with preference rates ranging from 78.5% to 91%. However, a minority of women expressed a preference for CS. Overall, these findings demonstrate a consistent inclination toward vaginal birth among university students and populations from various countries,

although a notable minority still opt for caesarean delivery.

The current study found that most university students preferred private hospitals as their preferred place for childbirth. This trend aligns with observations from countries with high CS rates, where private facilities account for nearly half of primary CS deliveries, while around one eighth of participants favored governmental hospitals. These results underscore the importance of establishing comprehensive CS practice guidelines, particularly within the private healthcare sector, and the need to further explore factors influencing hospital preferences in Egypt.

Similarly, Stoll et al. (2020) documented wide variation in maternity care preferences among students across eight high-income countries, with midwifery care preferences ranging from 10.3% in the United States to 78.6% in the United Kingdom, and home birth preferences between 0.3% in the United States and 18.3% in Canada. Clemons et al. (2022) also reported that 70% of students favored hospital births under obstetric supervision. Collectively, these findings highlight diverse global perspectives on birth settings and emphasize the necessity of developing personalized, culturally sensitive maternal healthcare strategies.

The current study revealed that less than half of the university students demonstrated fair knowledge of childbirth methods. This partially aligns with previous research showing variability in awareness levels across different populations. For instance, Yaqoub et al. (2022) reported that 45.4% of women in Jeddah, Saudi Arabia, had poor knowledge of CS complications, with only 12.6% demonstrating good knowledge. In contrast, Maitanmi et al. (2023) found significantly higher knowledge levels 78.5% of pregnant women exhibited extensive understanding of CS, and 67.5% held positive perceptions toward it. These variations across studies highlight the influence of demographic, educational, and cultural factors on childbirth awareness. Consequently, targeted educational interventions are essential to enhance understanding of childbirth methods and their associated risks among diverse population groups.

The present study identified family experiences as the primary source of information about childbirth, followed by social media and

friends' experiences. This pattern aligns with Clemons et al. (2022), who reported that 85% of participants relied on family experiences, 73% on visual media, and 70% on friends. In contrast, school-based health education (45%) and written media (47%) were cited as less influential sources. Similarly, Wali et al. (2020) found that healthcare professionals, personal uncertainty, and other channels served as sources of information. Weeks et al. (2020) and Varnakioti et al. (2022) also highlighted family experiences as the most influential. Collectively, these findings underscore the major role of familial and social networks, along with modern media, in shaping childbirth perceptions and preferences. This suggests that health education efforts should incorporate these networks to promote evidence-based understanding among young adults.

The present study found that more than half of university students expressed positive attitudes toward natural childbirth. These results are in agreement with previous research, such as Heidari and Kohan (2015), who reported even higher rates of positive attitudes among midwifery students (97%) and nursing students (78.6%) toward vaginal delivery. In contrast, Varnakioti et al. (2022) observed more nuanced attitudes among young students, with 37.9% expressing positive views and 49.0% holding mixed positive and negative perspectives. Notably, despite the global increase in caesarean section rates, young students continue to prefer vaginal birth for healthy future pregnancies. These findings highlight the complexity of attitudes toward different methods of childbirth among student populations.

The current study indicates that most university students perceive vaginal delivery (VD) as a natural process, while inadequate support in delivery rooms is associated with increased fear of childbirth. Similar patterns have been noted in previous research. Clemons et al. (2022) found that 72% of students regarded VD as natural, 63% believed it facilitated quick recovery, and 61% preferred it to avoid surgical risks. Mete and Alparslan (2018) reported that 62.2% of participants considered VD healthier for both mother and baby. Michalik, Czerwińska-Osipiak, Szablewska, Pracowity, & Olszewska, (2022) observed that 68.9% of students viewed VD as safer than caesarean section (CS), with 83.6% attributing faster recovery to VD. Additionally,

Handan and Gulay (2017) found that 35% preferred natural birth for infant health, whereas 11.8% favored CS for less pain. Stoll et al. (2020) noted that 96.2% of midwifery students and 68% of medical students considered VD safer for low-risk women, and Sys et al. (2022) found that 73.26% of students favored vaginal birth after a previous CS. Overall, these findings emphasize a consistent preference for VD among student populations, mainly due to perceived safety, health benefits, and improved recovery.

The current study shows that female university students hold diverse attitudes toward CS, with the majority maintaining neutral views; 27% express positive attitudes, and only 1.4% demonstrate negative attitudes. This finding aligns with those of Heidari and Kohan (2015), who reported that 93.5% of midwifery students had neutral attitudes, while only 5% of nursing students expressed positive views toward CS. Similarly, Wali et al. (2020) found that 28% of participants would choose CS and 72.5% did not regret their decision. Conversely, studies on pregnant women, such as those by Maitanmi et al. (2023) recorded higher rates of positive attitudes toward CS 93.

These variations in attitudes across different populations likely reflect differences in cultural context, personal experience, and levels of childbirth-related knowledge. The prevalent neutral attitudes among university students may indicate limited firsthand experience or insufficient understanding of the procedure. Additionally, the relatively low proportion favoring CS contrasts with global trends of rising CS rates, suggesting a perceptual gap between student views and current obstetric practices. These findings highlight the importance of future research to explore the underlying factors influencing CS attitudes and how these perceptions may shape future maternal health decisions.

The current study revealed that most university students supported CS for reducing fetal risks and allowing longer hospital stays but disagreed on its financial benefits, painlessness, and marital impact. Similarly, Clemons et al. (2022) and Weeks et al. (2020) reported that preferences for CS were mainly driven by fear of labor pain, concerns about vaginal integrity, and the convenience of scheduling deliveries. Stoll et

al. (2019) found that 55.8% of students believed birth technology simplifies delivery, 49.1% thought it protects the baby, and 50.8% supported non-medical CS for reproductive autonomy.

Countries with higher CS rates tend to show greater acceptance of the procedure. Wali et al. (2020) observed that Egyptian women viewed CS as safer and less detrimental to fertility, while Johansson, Alvan, Pettersson, & Hildingsson, (2023) found that although many women considered CS the safest option, healthcare professionals emphasized its associated risks. These findings underscore the complex nature of attitudes toward CS and highlight the need for structured educational interventions to support informed childbirth decisions. The study also found correlations between students' age, family income, mothers' educational level, and attitudes toward both VD and CS. Similarly, Stoll et al. (2019) reported that younger students (under 25 years old) were more likely to favor medical interventions and non-medically indicated CS, whereas older students held more conservative views. This suggests age is a significant demographic factor influencing childbirth preferences.

Moreover, medical education was positively associated with favorable attitudes toward VD and greater awareness of CS. While Stoll et al. (2020) suggested that CS normalization might impact non-medical students, González-Mesa et al. (2023) and Saraf & Bagga (2022) found that medical training fosters positive attitudes toward VD for low-risk pregnancies, which aligns with evidence-based obstetric practices. Finally, consistent with Heidari & Kohan (2015), this study found a significant relationship between knowledge and attitudes. Greater knowledge of VD correlated with more positive attitudes ($r = 0.30$), while increased awareness of CS risks was associated with less favorable perceptions ($r = -0.39$, $p = 0.01$). This finding highlights the importance of comprehensive education in shaping evidence-based perspectives on childbirth.

Conclusion

This cross-sectional study assessed female university students' preferences, knowledge, and attitudes regarding modes of delivery at Beni-Suef University, Egypt. The findings reveal that while the majority of participants recognize caesarean section as the most common delivery

mode, three-quarters prefer vaginal delivery for their future childbirth, with nearly two-thirds favouring private hospitals and physician-attended births. Knowledge levels were predominantly moderate, with significant gaps identified regarding complications and delivery options. Attitudes toward vaginal delivery were largely positive, emphasizing its natural benefits and maternal-infant bonding, whereas attitudes toward caesarean section were predominantly neutral. Demographic factors including faculty type, maternal education, age, and family income significantly influenced knowledge and attitudes. Importantly, a strong positive correlation emerged between knowledge and attitudes toward vaginal delivery, indicating that enhanced evidence-based education can foster more favorable attitudes toward physiological birth. These findings underscore the critical need for comprehensive maternal health education targeting university students to address knowledge gaps, counter misconceptions from non-evidence-based sources, and promote informed reproductive decision-making that aligns with WHO guidelines and may contribute to reducing Egypt's persistently high caesarean section rates.

Recommendations

- Implement comprehensive, curriculum-integrated maternal health education programs across medical and non-medical faculties to address identified knowledge gaps about delivery modes, risks, benefits, and WHO guidelines.
- Develop age-appropriate, culturally sensitive educational materials disseminated through social media, university health centers, and student orientation programs to counter misconceptions.
- Tailor interventions to demographic subgroups with lower knowledge or less favorable attitudes, including students from families with lower maternal education and non-medical faculty students.
- Engage family members and social networks in educational initiatives, recognizing their role as primary information sources for childbirth knowledge.
- Strengthen community health nurse-led education within universities, emphasizing

nurses' roles as educators, advocates, and facilitators of informed decision-making.

- Promote transparency and informed consent in maternity care decision-making, ensuring balanced, evidence-based information is provided to pregnant women.
- Explore qualitative dimensions through interviews and focus groups to investigate underlying reasons for preferences, fears, and cultural influences.
- Investigate healthcare provider perspectives, especially in private settings, to understand factors driving high caesarean section rates.
- Extend research to multiple universities and diverse geographic regions to enhance generalizability and identify regional variations.

Strengths and Limitations

This study's strengths include a large sample size, stratified random sampling to enhance representativeness, thorough assessment of knowledge and attitudes, and identification of factors shaping preferences. However, limitations should be noted: the study was conducted at a single institution, and its cross-sectional design prevents tracking changes or establishing causality. The use of an online questionnaire may introduce self-reporting bias, and the sample is limited to one university. Despite these constraints, the research offers valuable insights into university students' perspectives on childbirth methods and provides a foundation for future studies and interventions to support maternal health outcomes and guide healthcare practices.

Acknowledgments:

We extend our sincere gratitude to the female students of Beni-Suef University who participated in this study. Their willingness to share their knowledge and attitudes has been invaluable. We also thank the university administration for their support and cooperation throughout the research process.

References:

- Arundell, F., Alderdice, F., Carson, C., & Perra, O. (2024). Pre-university students' attitudes and beliefs about childbirth: Implications for reproductive health and maternity care. *Canadian Journal of Midwifery Research and Practice*. <https://cjmnp.com/index.php/cjmnp/article/view/108>
- Bam, V., Lomotey, A. Y., Kusi-Amponsah, A., Oduro, E., Akorfa, M. A., & Brakohiapa, K. B. (2021). Factors influencing decision-making to accept elective caesarean section: A descriptive cross-sectional study. *Heliyon*, 7(8), e07755. <https://doi.org/10.1016/j.heliyon.2021.e07755>
- Beni-Suef University. (2023). University profile.
- Betrán, A. P., Ye, J., Moller, A. B., Souza, J. P., & Zhang, J. (2021). Trends and projections of caesarean section rates: Global and regional estimates. *BMJ Global Health*, 6(6), e005671. <https://doi.org/10.1136/bmjgh-2021-005671>
- Central Agency for Public Mobilization and Statistics. (2021). *Egypt family health survey 2021*. CAPMAS.
- Clemons, J. H., Payne, D., Garrett, N., McAra-Couper, J., Farry, A., Swift, E. M., & Stoll, K. (2022). Gaining insight from future mothers: A survey of attitudes and perspectives of childbirth. *Midwifery*, 115, 103499. <https://doi.org/10.1016/j.midw.2022.103499>
- Dadipoor, S., Madani, A., Alavi, A., Roozbeh, N., & Safari-Moradabadi, A. (2020). Cesarean section beyond Cesar's borders: A mini review on the cultural history of cesarean section high prevalence rates in the Middle East. *Archives of Iranian Medicine*, 23(5), 335–341. <https://doi.org/10.34172/aim.2020.21>
- Elsharkawy, M. A., Ahmed, R. M., & Hassan, L. S. (2024). Prevalence and determinants of fear of childbirth among Egyptian pregnant women. *Maternal Health Research*, 39 (2), 167-178.
- Emrani, Z., Rafiei, H., Abedini, S., & Zarei, F. (2024). The effect of service-based learning on health education competencies of students in community health nursing internships. *BMC Nursing*, 23, 248. <https://doi.org/10.1186/s12912-024-01799-y>
- González-Mesa, E., Rengel-Díaz, C., Riklikiene, O., Thomson, G., Cazorla-Granados, O.,

- Abreu, W., Morgado-Neves, D., Gökçe Isbir, G., Jonsdottir, S. S., & Karlsdóttir, S. I. (2023). Assessment of the attitude towards childbirth in health sciences students-development and validation of the questionnaire CAVE-ST. *Current Psychology*, 42, 6086-6095. <https://doi.org/10.1007/s12144-021-02049-6>
- Gresz, M. (2024). Inequity in uptake of maternal health care services in developing countries: A systematic review and meta-analysis. *Frontiers in Public Health*, 12, 1415092. <https://doi.org/10.3389/fpubh.2024.1415092>
- Handan, O., & Gulay, R. (2017). University students' attitudes toward natural birth. *Journal of Gynecology and Women's Health*, 7(4), 555717. <https://doi.org/10.19080/JGWH.2017.07.555717>
- Heidari, Z., & Kohan, S. (2015). The comparison of knowledge and attitude of midwifery and nursing students towards natural childbirth and caesarean section. *Journal of Midwifery and Reproductive Health*, 3(3), 437-443.
- <https://www.bs.u.edu.eg/Backend/Uploads/PDF/university/Beni%20Suef%20Profile.pdf>
- Jawa, A. H., Al-Swailmi, F. K., Gufran, M. B., Mehmood, T., & Iftikhar, S. (2023). Global increased cesarean section rates and public health implications: A call to action. *Health Science Reports*, 6(5), e1274. <https://doi.org/10.1002/hsr2.1274>
- Johansson, M., Alvan, J., Pettersson, A., & Hildingsson, I. (2023). Conflicting attitudes between clinicians and women regarding maternal requested caesarean section: A qualitative evidence synthesis. *BMC Pregnancy and Childbirth*, 23, 210. <https://doi.org/10.1186/s12884-023-05510-y>
- Khairwar, G. (2024). Empowering communities: Unveiling the impact of community health nurses' workload and contributions to public well-being. *ResearchGate*. <https://www.researchgate.net/publication/379044957>
- Kingdon, C., Downe, S., & Betran, A. P. (2021). Do women prefer caesarean sections? A qualitative evidence synthesis of their views and experiences. *BMC Pregnancy and Childbirth*, 21(1), 356. <https://doi.org/10.1186/s12884-021-03827-9>
- Likert, R. (1932). A technique for the measurement of attitudes. *Archives of Psychology*, 140, 1-55.
- Maitanmi, B. T., Oluyomi, O. V., Aderemi, I. O., Maitanmi, J. O., Aminu, A., Ojewale, M. O., Okondu, O. E., & Akingbade, O. (2023). Knowledge, attitude and perception of caesarean section among pregnant women attending antenatal clinic at Babcock University Teaching Hospital, Ilishan-Remo, Ogun State. *The Journal of Maternal-Fetal & Neonatal Medicine*, 36(1), 2278019. <https://doi.org/10.1080/14767058.2023.2278019>
- McCall, S. J., Semaan, A., Altijani, N., Opondo, C., Abdel-Fattah, M., & Kabakian-Khasholian, T. (2021). Trends, wealth inequalities and the role of the private sector in caesarean section in the Middle East and North Africa: A repeat cross-sectional analysis of population-based surveys. *PLoS ONE*, 16(11), e0259791. <https://doi.org/10.1371/journal.pone.0259791>
- Mete, A., & Alparslan, O. (2018). Investigating university students' preferences for mode of delivery. *International Journal of Caring Sciences*, 11(3), 1408-1415.
- Michalik, A., Czerwińska-Osipiak, A., Szablewska, A., Pracowity, M., & Olszewska, J. (2022). Factors associated with vaginal/caesarean birth attitudes among medical students. *Healthcare*, 10(3), 571. <https://doi.org/10.3390/healthcare10030571>
- Ministry of Health and Population. (2016). *Research ethics committee guideline*. Egyptian Ministry of Health and Population.
- Ministry of Health and Population. (2023). *Annual health statistics report 2023*. Egyptian Ministry of Health and Population.
- Ministry of Health and Population. (2024). *Maternal and child health statistics 2024*.

- Egyptian Ministry of Health and Population.
- Mohammed, H. M., Zaky, M. A., & Hany, A. M. (2024). Postpartum family planning among women attending maternal and child health centers in Assiut Governorate, Upper Egypt. *BMC Women's Health*, 24, Article 11162981. <https://jepha.springeropen.com/articles/10.1186/s42506-024-00160-0>
- Muhandule, C. J. L. S., Benetti, C. M. S., Barreto, B. C. S., & Pacagnella, R. C. (2024). Caesarean delivery on maternal request: The perspective of the postpartum women. *BMC Pregnancy and Childbirth*, 24(1), 257. <https://doi.org/10.1186/s12884-024-06464-5>
- Patel, R., & Chouhan, D. S. (2024). Evaluating the impact of nurse-led childbirth education for first-time mothers: A quasi-experimental study. *Asian Journal of Biomedical Research*, 27(4S), Article 8169. <https://doi.org/10.53555/AJBR.v27i4S.8169>
- Puspitasari, D. I., Wahyuni, S., & Rakhmawati, W. (2023). Level of knowledge, attitude, and practice of pregnant women regarding mode of delivery: A systematic review. *Journal of International Women's Studies*, 24(6), 1-18.
- Sadek, R., Ibrahim, R., & Elsharkawy, S. E. (2021). Preference of mode of delivery among women in childbearing period in Egypt and factors affecting it. *Ginekologia i Położnictwo Medical Project*, 16(3), 68–75. <https://www.ginekologiaipoloznictwo.com/articles/preference-of-mode-of-delivery-among-women-in-childbearing-period-in-egypt-and-factors-affecting-it-83029.html>
- Saraf, T. S., & Bagga, R. V. (2022). Caesarean section or normal vaginal delivery: A cross-sectional study of attitude of medical students. *Journal of Education and Health Promotion*, 11, 357. https://doi.org/10.4103/jehp.jehp_243_22
- Senanayake, H., Piccoli, M., Valente, E. P., Businelli, C., Mohamed, R., Fernando, R., Dias, T., & Giani, U. (2022). Factors contributing to rising cesarean section rates in South Asian countries: A systematic review. *Asian Journal of Medical Sciences*, 13(1), 1–13. <https://doi.org/10.3126/ajms.v13i1.40904>
- Stoll, K. H., & Hall, W. (2021). Students' attitudes towards birth decisions. *Journal of Reproductive and Infant Psychology*, 31(1), 9–22. <https://doi.org/10.1080/02646838.2012.752525>
- Stoll, K. H., Downe, S., Edmonds, J., Gross, M. M., Malott, A., McAra-Couper, J., Sadler, M., Thomson, G., & Team, I. S. (2020). A survey of university students' preferences for midwifery care and community birth options in 8 high-income countries. *Journal of Midwifery & Women's Health*, 65(2), 131-141. <https://doi.org/10.1111/jmwh.13042>
- Stoll, K., Edmonds, J., Sadler, M., Thomson, G., McAra-Couper, J., Swift, E. M., Malott, A., Streffing, J., Gross, M. M., & Downe, S. (2019). A cross-country survey of attitudes toward childbirth technologies and interventions among university students. *Women and Birth*, 32(3), 231-239. <https://doi.org/10.1016/j.wombi.2018.07.015>
- Sullivan, G. M., & Artino, A. R. (2013). Analyzing and interpreting data from Likert-type scales. *Journal of Graduate Medical Education*, 5(4), 541-542. <https://doi.org/10.4300/JGME-5-4-18>
- Sys, D., Baranowska, B., Kajdy, A., Tataj-Puzyna, U., Gotlib, J., Bączek, G., Juszczakiewicz, P., & Rąbajewski, M. (2022). Women's views and preferences regarding the mode of birth after caesarean section: Polish cross-sectional web-based survey. *European Journal of Obstetrics & Gynecology and Reproductive Biology*, 273, 26-32. <https://doi.org/10.1016/j.ejogrb.2022.04.009>
- Ukoha, W. C., Nzama, N. P., & Zondi, M. J. (2019). Primary health care nursing students' knowledge of and attitudes towards patient-centered care. *Health SA Gesondheid*, 24, 1158. <https://doi.org/10.4102/hsag.v24i0.1158>

- Varnakioti, D., Sarantaki, A., Gourounti, K., & Lykeridou, A. (2022). Identifying factors associated with adolescents' intention for childbirth. *Journal of Mother and Child*, 26(2), 93-103. <https://doi.org/10.34763/jmotherandchild.20222602.d-22-00013>
- Wahdan, M., Hakim, S., El Gaafary, M., Sos, D., Wassif, G., Hussein, W., Mokhtar, A., Hussein, A., El Awady, M., Rady, M., & Anwar, W. (2022). Rising trends in Caesarean section in 6 Egyptian governorates. *Eastern Mediterranean Health Journal*, 28(5), 336-344. <https://doi.org/10.26719/emhj.22.012>
- Wali, A. A.-E.-D., Taher, A., & Abd-El-Fatah, S. M. (2020). Awareness, knowledge, and attitude of Egyptian women toward caesarean delivery: A cross-sectional survey. *Journal of South Asian Federation of Obstetrics and Gynaecology*, 12(4), 203-208. <https://doi.org/10.5005/jp-journals-10006-1805>
- Weeks, F. H., Sadler, M., & Stoll, K. (2020). Preference for caesarean and attitudes toward birth in a Chilean sample of young adults. *Women and Birth*, 33(2), e159-e165. <https://doi.org/10.1016/j.wombi.2019.04.005>
- World Health Organization. (2019). *WHO recommendations: Non-clinical interventions to reduce unnecessary caesarean sections*. World Health Organization. <https://apps.who.int/iris/handle/10665/275377>
- World Medical Association. (2024). *WMA Declaration of Helsinki – Ethical principles for medical research involving human participants* (2024 revision). <https://www.wma.net/policies-post/wma-declaration-of-helsinki/>
- Yassin, K., Saad, A. B., & Al-Swailmi, F. K. (2024). Rising cesarean section rates in Pakistan: Analyzing frequency and key risk factors in a tertiary-care hospital. *Cureus*, 16(9), e69343. <https://doi.org/10.7759/cureus.69343>
- Zayed, M. I., El Kelany, O. A., & Alkalash, S. H. (2021). Caesarean sections rate and maternal knowledge and attitude towards the mode of delivery in Egypt. *Menoufia Medical Journal*, 34(2), 528-537. https://doi.org/10.4103/mmj.mmj_251_20
- Yaqoub, R. M., Khouj, M. A., Alsaif, A. A., Eissa, G. A., Alhemdi, J. A., Albasri, S., Yaqoub, R., Khouj, M., & Alsaif, A. (2022). Awareness and knowledge of caesarean section complications among women in Jeddah, Saudi Arabia. *Cureus*, 14(11), e31298. <https://doi.org/10.7759/cureus.31298>