Original Article

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Psychological Determinants of Vaginal Birth Self-efficacy in Nulliparous Women: The Role of Childbirth Belief Systems

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Abstract

Aim: Childbirth self-efficacy is a critical psychological variable that influences birth outcomes and maternal well-being; however, its exact predictors among nulliparous women remain underinvestigated. This research aimed to outline variables that affect self-efficacy for vaginal delivery among nulliparous women, with a specific interest in the effects of birth belief systems.

Methods: This cross-sectional observational study was conducted between February and July 2025 among nulliparous women receiving prenatal care. Validated measures, such as the Birth Beliefs Scale (medical process and natural process subscales) and the Self-efficacy Regarding Vaginal Birth Scale, were used for data collection. Predictors of vaginal birth self-efficacy were determined using hierarchical multiple regression and structural equation modeling.

Results: Two hundred and eighty nulliparous women were included in the study. Self-efficacy was negatively related to medical process beliefs ($b=-0.168$, $p<0.01$) but positively related to natural process beliefs ($b=0.154$, $p<0.01$). The regression model accounted for 18.7% of the variance in self-efficacy [$F(6,273)=10.47$, $p<0.001$]. Other important predictors were planned delivery approach, pregnancy experience rating, education level, and spousal support.

Conclusion: Birth belief systems are the first psychological predictors of vaginal birth self-efficacy in women in their first pregnancy. To help prevent low self-efficacy, healthcare providers should consider adopting screening procedures to identify women whose belief patterns are linked to low self-efficacy.

Keywords: Prenatal education, attitude to health, self-efficacy, parturition, parity

Introduction

Childbirth self-efficacy has been defined as a vital psychological construct that determines birth experiences and obstetric outcomes among nulliparous women (1,2). Self-efficacy is grounded in Bandura's social cognitive theory, which posits that an individual believes in his or her ability to perform certain behaviors when working (3). Empirical evidence shows that increased birth-related self-efficacy is associated with reduced length of labor, better pain management, fewer medical interventions, and greater satisfaction with the birth experience (4,5). Conversely, low self-efficacy is associated with heightened fear of childbirth, increased requests for cesarean section, and higher levels of postpartum psychological distress (6,7).

Among first-time mothers, direct experience is less important for the development of self-efficacy, whereas vicarious learning, verbal persuasion, social support, and messages given by the provider are more relevant

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(8,9). Another important psychological dimension that potentially influences the development of self-efficacy is the maternal belief system regarding childbirth (10). An orientation toward medical processes defines birth as a risk-taking process requiring technological intervention and professional care, whereas an orientation toward natural processes emphasizes maternal ability and the normalcy of birth (11,12). Such belief orientations are found to shape the birth preferences, labor coping mechanisms, and final birth outcomes (13,14).

Although previous studies emphasize the importance of psychological factors for childbirth outcomes, few systematic studies have examined the relationship between childbirth belief systems and self-efficacy, especially among nulliparous women who have no prior experience in childbirth (15,16). These relationships are important to understand in order to develop specific prenatal interventions likely to increase maternal confidence. However, evidence evaluating the simultaneous influence of childbirth belief systems and socio-demographic factors on vaginal birth self-efficacy among nulliparous women remains limited, particularly in middle-income countries. We hypothesized that vaginal birth self-efficacy would be significantly predicted by birth belief orientations, with medical-process beliefs showing negative correlations and natural-process beliefs showing positive correlations. In this context, we aimed to explore the determinants of vaginal birth self-efficacy in nulliparous women, with a specific focus on childbirth beliefs compared with demographic and clinical factors.

Materials and Methods

Complicance with Ethical Standarts

The research was approved by the Istanbul Medipol University Non-Interventional Clinical Research Ethics Committee (approval no.: 1360, date: 26.12.2024). The data were collected at Haseki Training and Research Hospital through an online survey. The electronic written informed consent of all participants was obtained in accordance with the principles of the Declaration of Helsinki.

Design of the Study and Study Population

The proposed cross-sectional observational study was conducted to examine factors affecting self-efficacy for vaginal birth among nulliparous women recruited from prenatal care centers between February and July 2025. The study design was based on the STROBE guidelines for observational studies (17). The inclusion criteria were nulliparous women; gestational age 16-38 weeks; singleton pregnancy; and no history of miscarriage or termination of pregnancy. Exclusion criteria were multiple gestation, known fetal anomalies, and severe maternal medical conditions requiring specialized obstetric treatment. G*Power software was used to compute the sample size, with the following parameters: multiple regression analysis (effect size f^2=0.15, alpha =0.05, power =0.95), which returned a minimum required sample size of 172 participants. Figure 1 is the flow diagram of the study.

Data Collection Instruments

The demographic variables recorded were maternal age, educational level, employment status, income level, and family structure. Clinical measurements included gestational age, body mass index, high-risk pregnancy, spousal support, and lifestyle variables, including physical activity and nutrition.

The Birth Beliefs Scale is a scale that measures beliefs about birth processes. It was created by Preis and Benyamini (10) and validated in Turkish by Paker and Ertem (18). The scale comprises two subscales: the medical process subscale (6 items), which includes beliefs that the birth process must be medically performed and controlled by experts; and the natural process subscale (5 items), which includes beliefs that women have the ability and physiological normality of the birth process. The internal consistency is acceptable in both subscales (Cronbach's alpha =0.80).

Self-efficacy with vaginal birth scale, created by Chu et al. (19) and translated into the Turkish language by Karadeniz and Kavlak (20), is used to assess maternal self-confidence in their ability to handle labor pain, adhere to medical instructions, and maintain control over their emotions during the process of giving birth, using 9 items. Its scale shows good internal consistency (Cronbach's alpha =0.92).

Statistical Analysis

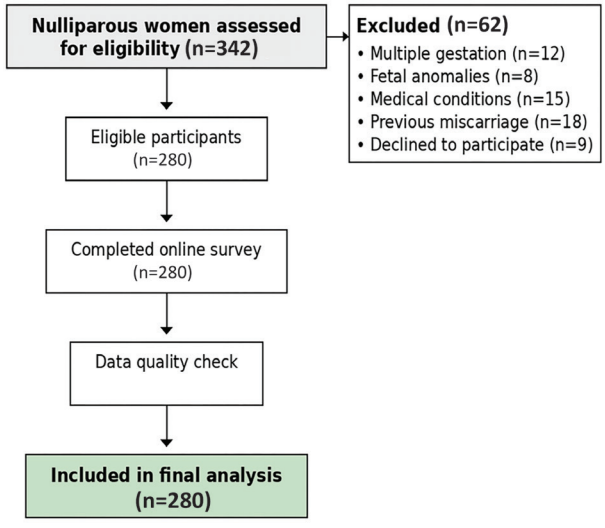

Figure 1. Study flow diagram

R software version 4.3.2 was used to carry out statistical analyses (21). Descriptive statistics included means (with standard deviations) for continuous variables and frequencies (with percentages) for categorical variables. Normality was assessed using Shapiro-Wilk tests and Q-Q plots. Pearson correlation was used to analyze bivariate relationships between two continuous variables; Spearman's correlation was used to analyze bivariate relationships between two ordinal variables; point-biserial correlation was used to analyze bivariate relationships between two binary variables; and the eta coefficient was used to analyze bivariate relationships between two nominal variables. The enter method was used in a multiple linear regression analysis, with self-efficacy as the dependent variable. Multicollinearity was evaluated using variance inflation factors, with a threshold of 5. Structural equation model (SEM) was used to investigate theoretical associations using the lavaan package (22). The comparative fit index (CFI 0.95), Tucker-Lewis index (TLI 0.95), root-mean-square error of approximation (RMSEA <0.06), and standardized root-mean-square residual (SRMR <0.08) were used to evaluate model fit. Statistical significance was set at p=0.05.

Results

Table 1 shows descriptive statistics. The nulliparous women recruited in the study numbered 280, and the mean age of the study population was 27.40±3.90. Most of them completed tertiary education (62.5%), were in skilled or professional jobs (72.1%), and reported middle-to-high income levels (63.6%). The majority (86.8%) had low-risk pregnancies, and most respondents (85.4%) rated their pregnancy experience as positive. The mean scores for medical process beliefs, natural process beliefs, and vaginal birth self-efficacy were 3.00±0.76, 3.81±1.04, and 59.14±20.71, respectively. These findings reveal moderately high support for medical-process beliefs, moderately high support for natural-process beliefs, and moderately high self-efficacy among the study population.

The bivariate analysis showed significant associations with self-efficacy (Table 2). The beliefs about medical process were negatively correlated (r=-0.199, p<0.01), but the beliefs about natural process were positively correlated (r=0.189, p<0.01). The level of education (r=0.142, p=0.05), pregnancy experience rating (r=0.156, p=0.05), spousal support (rpb=0.134, p=0.05), and planned delivery approach (r=0.198, p=0.01) were also significantly correlated with self-efficacy.

Table 1. Descriptive characteristics of study participants (n=280)

Variable	Mean±SD / n (%)
Demographic variables	
Age (years)	27.40±3.90
Higher education	175 (62.5%)
Skilled/professional employment	202 (72.1%)
Middle-high income	178 (63.6%)
Nuclear family	251 (89.6%)
Pregnancy-related variables	
Gestational age (weeks)	25.18±5.87
Low-risk pregnancy	243 (86.8%)
Good/very good pregnancy experience	239 (85.4%)
BMI (kg/m²)	26.91±4.49
Spousal support present	230 (82.1%)
Childbirth education received	136 (48.6%)
Natural vaginal delivery planned	201 (71.8%)
Scale scores	
Medical process beliefs (1-5)	3.00±0.76
Natural process beliefs (1-5)	3.81±1.04
Vaginal birth self-efficacy (0-90)	59.14±20.71
SD: Standard deviation, BMI: Body mass index	

Table 2. Associations between study variables and vaginal birth self-efficacy (n=280)

Variable	Effect size	95% CI	p-value
Medical process beliefs	r=-0.199	(-0.314, -0.078)	<0.01
Natural process beliefs	r=0.189	(0.073, 0.301)	<0.01
Education level	ρ=0.142	(0.025, 0.255)	<0.05
Pregnancy experience	ρ=0.156	(0.040, 0.268)	<0.05
Spousal support	rpb=0.134	(0.017, 0.247)	<0.05
Planned delivery approach	ρ=0.198	(0.121, 0.275)	<0.01
Age	r=-0.084	(-0.199, 0.034)	NS
Gestational age	r=0.079	(-0.038, 0.194)	NS
BMI	r=0.087	(-0.030, 0.202)	NS

Pearson correlation was used for continuous variables, Spearman's correlation for ordinal variables, point-biserial correlation for binary variables, and eta coefficient for nominal variables
r: Pearson correlation, ρ: Spearman correlation, rpb: Point-biserial correlation, η: Eta coefficient, CI: Confidence interval, NS: Not significant, BMI: Body mass index

The multiple regression model was statistically significant and accounted for 18.7% of the variance in self-efficacy scores [F(6,273)=10.47, p<0.001]. The strongest negative predictor was medical process beliefs (b=0.168, p<0.01), and the strongest positive predictor was natural process beliefs (b=0.154, p<0.01). These findings are presented in Table 3.

The SEM showed a good fit (CFI=0.962, TLI=0.951, RMSEA=0.048, SRMR=0.065). The results of the path analysis indicated that self-efficacy was indirectly affected by education level via natural process beliefs, which mediated the relationship between demographic factors and maternal confidence.

Discussion

This research investigated the psychological and socio-demographic factors influencing vaginal birth self-efficacy in nulliparous women. The results indicated that childbirth belief systems were significant predictors of maternal self-efficacy. In particular, beliefs about medical processes were linked to lower self-efficacy, while beliefs about natural processes were linked to higher maternal confidence.

The current literature defines the belief systems about birth as key psychological factors that influence self-efficacy for vaginal birth among nulliparous women. The results of this study provide empirical support for theoretical frameworks that focus on psychological elements in predicting birth experience (23,24) and supplement the current literature on modifiable influences on maternal confidence.

The negative relationship between medical process beliefs and self-efficacy (b=-0.168) is clinically significant. It raises the possibility that an excessive emphasis on medical procedures can unintentionally undermine maternal confidence in the ability to give birth naturally. Women who strongly favor medical interventions may become dependent on external medical care and lose confidence in their physiological ability to give birth normally (25). This finding is consistent with previous studies that indicate the possibility of diminished maternal agency and increased anxiety during labor associated with excessive medicalization of birth procedures (26,27). Healthcare providers are advised to keep in mind that, although relevant medical information is necessary, the tendency to present childbirth as a medical event that requires intervention might adversely affect maternal self-efficacy.

On the other hand, the natural process beliefs and self-efficacy were positively related (b=0.154), a finding that contributes to interventions based on maternal competence and physiological birth. This result is consistent with studies showing that women who believe that birth is a normal process have higher self-efficacy and better birth outcomes (28,29). The SEM analysis found that natural process beliefs act as mediators that help translate educational benefits into increased maternal confidence. Positive messages emphasizing women's inherent birthing abilities that are included in prenatal education programs could also be effective in improving self-efficacy (30,31).

The results of our study agree with recent research showing that psychological variables such as birth beliefs and delivery preferences have a greater impact on maternal confidence than conventional demographic or clinical variables (32,33). The 18.7 per cent explained variance in beliefs about birth shows that birth beliefs are significant factors in the development of self-efficacy, although other factors need to be explored. Further studies should examine how fear of childbirth, perceived quality of social support networks, and healthcare providers' communication styles can influence the development of maternal self-efficacy (34,35).

Study Limitations

This research has several limitations that are worth considering. The cross-sectional design precludes drawing causal conclusions because self-efficacy and birth beliefs can influence each other over time. Directional relationships would be better supported by longitudinal studies that observe changes in beliefs and self-efficacy during pregnancy. The use of a single-center recruitment

Table 3. Multiple regression analysis predicting vaginal birth self-efficacy (n=280)

Predictor variable	β	SE	95% CI	p-value	VIF
Medical process beliefs	-0.168	0.042	(-0.251, -0.085)	<0.01	1.89
Natural process beliefs	0.154	0.038	(0.079, 0.229)	<0.01	1.76
Planned delivery approach	0.134	0.041	(0.053, 0.215)	<0.01	2.34
Pregnancy experience	0.112	0.032	(0.049, 0.175)	<0.01	1.34
Education level	0.089	0.028	(0.034, 0.144)	<0.05	1.23
Spousal support	0.078	0.036	(0.007, 0.149)	<0.05	1.12
Model summary	R^2=0.187		F(6,273) =10.47	<0.001	

Multiple linear regression analysis using enter method was applied
β: Standardized beta coefficient, SE: Standard error, CI: Confidence interval, VIF: Variance inflation factor

approach can limit external validity in other care or cultural environments. Use of self-report measures may lead to response bias, such as social desirability effects. Self-efficacy formation may be influenced by unmeasured variables such as fear of childbirth, perceived quality of support, pre-existing exposure to birth stories, and relationships with healthcare providers. In addition, the relatively uniform socio-economic traits of the study population may restrict the applicability of the results to more heterogeneous groups, such as those with varying income levels, educational backgrounds, and cultural beliefs about childbirth. Lastly, the clinical implications of self-efficacy on birth outcomes could not be directly assessed, as behavioral outcomes such as the actual delivery method were not investigated.

Nevertheless, this study provides new evidence regarding psychological factors associated with vaginal birth self-efficacy among Turkish nulliparous women. The study's overall statistical approach, using multiple regression and SEM, strengthens the plausibility of the observed relationships. The use of validated Turkish instruments ensures that the measures are culturally appropriate and valid. The sample size was adequate and exceeded the minimum a priori sample size calculated to ensure sufficient statistical power for the intended analyses.

Conclusion

Birth belief systems are key psychological antecedents of self-efficacy for vaginal birth among nulliparous women. Medical process beliefs are negatively correlated with maternal confidence, whereas natural process beliefs are positively correlated with maternal confidence. Healthcare providers should consider screening women to identify those with belief patterns associated with low self-efficacy, enabling the provision of individualized prenatal care that maximizes maternal confidence and perhaps enhances birth outcomes. Prenatal education programs that balance required medical content with positive messages about women's birthing abilities may effectively increase the self-efficacy of nulliparous women. Therefore, targeting childbirth beliefs through prenatal education should be a strategy to improve maternal confidence and potentially promote vaginal birth.

Declaration Regarding the Use of AI and AI-Assisted Technologies: During the preparation of this work, the authors used artificial intelligence tools to assist in verifying statistical analyses and formatting the manuscript. After carefully reviewing and editing the content as necessary, the authors take full responsibility for the publication's content.

Ethics

Ethics Committee Approval: The research was approved by the Istanbul Medipol University Non-Interventional Clinical Research Ethics Committee (approval no.: 1360, date: 26.12.2024).

Informed Consent: All participants provided electronic written informed consent prior to participation.

Footnotes

Authorship Contributions

Surgical and Medical Practices: M.P.Y., Concept: M.P.Y., A.C., Design: M.P.Y., I.I.O., A.C., Data Collection or Processing: M.P.Y., B.G., Analysis or Interpretation: M.P.Y., B.G., Literature Search: M.P.Y., B.G., A.C., Writing: M.P.Y., I.I.O.

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