Effect of Hands and Knees position versus lateral Position on Progress of Labor

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Abstract

Background: Changing positions during labor has paramount importance as it enhances maternal outcomes, stimulates uterine contractions, and facilitates the natural progression of labor. **Aim:** to examine the effect of hands and knees position versus lateral position on progress of labor. **Research design:** A quasi-experimental design was adopted. **Setting**: This study was conducted at the labor and delivery unit of the National Medical Institute in Damanhour, El-Beheira Governorate, Egypt. **Subjects**: A convenient sample of 80 parturient women was selected based on specific inclusion criteria. **Tools**: Two tools were used, a structured interview questionnaire and a partograph. **Results:** There existed a statistically significant difference between the two groups from the third to the sixth hour concerning the frequency, duration, interval, and intensity of uterine contractions, alongside cervical effacement and dilatation. Furthermore, a highly statistically significant difference was identified between the two groups pertaining to the mean duration of the first, second, and third stages of labor. **Conclusion:** The findings concluded that parturient women who assume the hands and knees position experienced faster labor progress compared to those who assume the lateral position. **Recommendation:** It is suggested to raise awareness of women regarding the benefits of the hands and knees position to facilitate delivery.

Keywords: Hands and knees position, Lateral position, Progress of labor.

Introduction

Labor and delivery pose significant obstacles globally, particularly in developing nations. Various problems during pregnancy and delivery can have a major impact on the mother and fetal morbidity and mortality rates. According to the World Health Organization, for every maternal mortality attributed to pregnancy and childbirth, it is estimated that there are between 20 and 30 instances of maternal morbidity. In the year 2023, approximately 260,000 women succumbed during or after pregnancy and childbirth. A maternal death was recorded nearly every two minutes, and almost 90% of these maternal fatalities occurred in developing countries. Recent reports indicate that the incidence of dystocia complicates approximately 0.3%–3% of all vaginal deliveries. **(Hill et al., 2020; United Nations Children's Fund (UNICEF), 2023; World Health Organization (WHO), 2023; Cresswell et al., 2025; Das & Kaur, 2025)**

Worldwide, it has been documented that prolonged and obstructed labor impacts an estimated 5–8% of all deliveries. Delayed labor progression is commonly observed in high-income nations, frequently correlated with elevated cesarean section rates, whereas in resource-constrained environments, it is more closely associated with adverse outcomes due to delays in identification and intervention **(Ayenew, 2021).**

Labor constitutes a physiological process characterized by a sequence of rhythmic, involuntary, or medically induced contractions of the uterus, culminating in the effacement and dilatation of the cervical canal, thereby facilitating the passage of the fetus through the birth canal, and comprises four distinct stages (Norwitz, 2023). The first stage commences with the onset of contractions and concludes upon the complete dilatation of the cervix, encompassing two specific phases: latent and active **(Artal-Mittelmark, 2022).**

During the active phase of the first stage of labor, the cervix opens from 4 to 7–8

centimeters, and the contractions get longer, stronger, and more frequent (usually every 3 to 4 minutes). They last from 30 to 60 seconds, and the presenting part goes down well into the mid-pelvis **(Stanford Medicine Children's Health, 2023).** The active phase typically lasts two to four hours in multiparas and five to seven hours in nulliparas. It is anticipated that the cervix will dilate at a rate of approximately 1.2 cm/hour in nulliparous women and 1.5 cm/hour in multiparous women **(Artal-Mittelmark, 2022).**

Ineffective labor management can cause delay in the progress of cervical dilatation and failure of descent of the fetal presenting part, which can result in dystocia or difficult labor. These conditions are linked to an increased risk of maternal complications, including vaginal lacerations, anal tears, uterine rupture, postpartum hemorrhage, rectovaginal fistula, and an increased rate of cesarean sections **(Baxley & Gobbo, 2004; Davis et al., 2022; Olsen, 2022).**

The American College of Obstetricians and Gynecologists (ACOG) recommends frequent position changes that do not interfere with maternal or fetal monitoring and are appropriate unless contraindicated by complications **(American College of Obstetricians and Gynecologists Committee (ACOG), 2019).** Alteration of positions not only aids women in managing labor pain but also promotes the progression of labor, facilitates movement of the pelvic bones, assists the fetus in achieving optimal engagement, mitigates fatigue, prevents excessive soreness of muscles, alleviates pressure on the pelvic region, and enhances maternal outcomes **(Nguyen, 2023).** The adoption of upright positions during the first stage of labor encompasses ambulation, standing, sitting, semi-sitting, kneeling, squatting, and positioning on hands and knees. While horizontal positions include supine, lithotomy, semi-recumbent or recumbent, Trendelenburg, and lateral positions **(Huang et al., 2019; Kibuka et al., 2021).**

The hands and knees position represents a gravity-neutral stance, wherein the laboring woman is positioned "on all fours," resembling a prostrate posture with all four limbs in contact with the floor or bed, akin to a crawling infant **(Caughey, 2023).** The hands-and-knees position engenders an increased pelvic diameter, thereby facilitating the descent and rotation of the fetal head, reducing the incidence of shoulder dystocia, and aiding in the transition from occipitoposterior to occipitoanterior presentation during labor **(Cappetta, 2020; Zheng et al., 2021).**

The hands-and-knees position also encompasses numerous benefits, such as augmenting the probability of spontaneous vaginal delivery, alleviating pain and stress throughout labor, enhancing uterine blood circulation, and improving fetopelvic relationships; it reduces lumbar pressure, thereby mitigating back discomfort, increases fetal oxygenation, facilitates pelvic rocking and bodily movement, alleviates pressure on hemorrhoids, permits vaginal examinations, and is occasionally favored as a pushing position by women experiencing back labor, while simultaneously allowing for continuous fetal monitoring **(Cappetta, 2020; Rockhold, 2020; Stroh, 2023).**

The lateral position, also referred to as the side-lying position, entails lying on the left side, with one or both knees flexed, and the placement of a pillow between the knees for enhanced comfort, or with the upper legs elevated and supported to maintain an open pelvis **(Cunningham, 2023).** The upright and lateral positions are advocated over lithotomy or supine positions, as the latter tend to compress intra-abdominal vessels, resulting in suboptimal uteroplacental perfusion and various fetal heart rate irregularities; such compression is mitigated in upright and lateral positions, particularly concerning the inferior vena cava **(King et al., 2019).**

Although the lateral position is efficacious in enhancing placental perfusion, providing the parturient women with opportunities to rest between contractions, augmenting the effectiveness of contractions, relieving perineal pressure, decreasing the likelihood of perineal trauma, lessening the necessity for instrumental assistance such as forceps or vacuum extraction, and alleviating pressure on the sacrum and coccyx, it may not function effectively with gravity, potentially leading to a deceleration of fetal descent through the birth canal, thereby allowing the perineum additional time to

gradually stretch, which can result in a delay in the progression of labor, in addition to complicating the assessment of fetal heart rate **(Cappetta, 2020; Weiss, 2021).**

Nurses assume a critical function during the first stage of labor, which represents the most protracted and essential stage of the birthing process. Their responsibilities commence with the establishment of a therapeutic rapport with the parturient woman, supporting her, and systematically monitoring uterine contractions, cervical effacement and dilatation. As well as the descent of the fetal head to assess progress of labor and observation of fetal well-being through the regular evaluation of fetal heart rate **(Sharma, 2019; Artal-Mittelmark, 2022).** Furthermore, the nurse plays an important role in facilitating the woman's utilization of appropriate non-pharmacological strategies aimed at alleviating labor pain and encouraging frequent positional changes throughout the labor process **(Mwakawanga et al., 2022).**

Significance of the study

Failure to change position during labor is significantly correlated with delayed labor progression. When a woman remains in a singular, often supine, position for extended durations, the efficacy of uterine contractions may diminish, optimal utilization of pelvic dimensions is not achieved, and fetal descent may be impeded. This lack of mobility diminishes maternal comfort, exacerbates fatigue, and may compromise uteroplacental blood circulation. Consequently, it contributes to prolonged labor, increasing maternal exhaustion, which necessitates obstetric interventions **(de Verastegui-Martín et al., 2023).**

In Egypt, 49% of maternal deaths occur within 24 hours of delivery **(Mahmoud & Omar, 2018).** Labor is hard work; however, frequent positional changes may facilitate the advancement of labor and prevent prolonged labor **(Rockhold, 2020)**.

Much research has been done on the effect of ambulation and upright positions, such as standing, sitting, and semi-sitting on the progress of labor, while limited research has addressed the impact of various positions, such as hands-and-knees and lateral positions, on the progress of labor. Consequently, this study was undertaken to examine the effect of hands-and-knees versus lateral position on progress of labor.

The findings of this study hold considerable importance within the domains of clinical practice, education, and research. In nursing practice, the investigation offers evidence-based recommendations for the selection of optimal maternal positions that may facilitate labor progression, mitigate complications, and enhance maternal comfort and outcomes. Regarding education, the outcomes can be incorporated into midwifery and maternity nursing curricula to effectively educate students and healthcare practitioners on the physiological advantages and practical implementation of various birthing positions. With respect to research, this study contributes significant data to the expanding corpus of evidence concerning non-pharmacological interventions in labor management and paves the way for subsequent inquiries into maternal satisfaction, fetal outcomes, and the influence of positioning throughout different stages of labor. In summary, the research advocates for safer, more woman-centered maternity care practices.

Aim of the Study

To examine the effect of hands and knees position versus lateral position on progress of labor.

Hypotheses:

H_0: Parturient women who assume the hands and knees position exhibit the same progress of labor as those who assume the lateral position.

H_1: Parturient women who assume the hands and knees position exhibit faster progress of labor than those who assume the lateral position.

H_2: Parturient women who assume the lateral position exhibit faster progress of labor than those who assume the hands and knees position.

Subjects and Method:

Research design:

A quasi-experimental design, specifically a posttest non-equivalent control group design, was adopted. The non-equivalent group's design, a modification of the between-subjects design, intentionally omits the random assignment of participants to distinct conditions. Within the confines of a posttest design, the dependent variable—progress of labor was evaluated following the application of the hands and knees position and the lateral position.

Settings:

This study will be conducted within the labor and delivery unit of the Damanhur Medical National Institute, El Behera Governorate, Egypt. This particular setting has been selected because it's the only hospital in Damanhour that offers free and comprehensive obstetric and gynecological services, as well as a significant influx of parturient women; this factor facilitated the researcher in attaining the requisite sample size.

Subjects:

A convenient sample of 80 parturient women was selected based on specific inclusion criteria such as primigravida were those with full-term pregnancies (37–42 weeks), carried a single, viable fetus of normal size positioned occipito-anteriorly, with normal course of pregnancy, they had to be in the active phase of the first stage of labor (the cervix opened 4 cm), had intact skin on their hands and knees, and express willingness to participate in the study. Parturient women were excluded if they had any medical, obstetric, or gynecological risk factors or conditions, as injuries, fractures, deep vein thrombosis, burns, wounds, scars, inflammation, or allergies affecting the arms or legs.

The sample size was calculated using the Epi Info 7 statistical program based on the following parameters: population size= 90/month, expected frequency=50%, acceptable error= 5%, confidence coefficient= 95%, and minimal sample size= 74. The final sample size consisted of 80 parturient women, assumed to represent a normal response. These women will be evenly allocated between the two study groups:

- Group I comprised 40 parturient women who assumed the hands-and-knees position during the active phase of the first stage of labor.
- Group II comprised 40 parturient women who assumed the left lateral position during the active phase of the first stage of labor.

Tools:

Two tools were employed to gather data.

Tool (I): A structured interview questionnaire

This tool was designed and utilized by the researcher following a review of relevant literature. It consisted of two sections: The first section covered demographic data, including age, occupation, level of education, residence, and family type. The second section addressed obstetric history, encompassing gravidity, parity, complications during previous pregnancies, deliveries, and postpartum periods, in addition to details of the current pregnancy such as gestational age in weeks and whether the pregnancy was desired or planned.

Tool (II): Partograph:

This tool was adopted from the WHO version (2000) **(Singh et al., 2022)**. It is designed to document all observations made during labor, covering the following aspects:

1. Progress of labor - including cervical effacement and dilatation rate, fetal head descent in fifths, uterine contractions (frequency per 10 minutes, duration, interval, and intensity), and duration of the first stage of labor.
2. Fetal condition - assessed through fetal heart rate (FHR), the mode of membrane rupture, amniotic fluid color, and molding of the fetal skull.
3. Maternal condition - monitored by pulse, temperature, blood pressure, urine output, and urine analysis for protein and acetone, as well as records of administered drugs, intravenous fluids, and oxytocin.

Validity and reliability of the tools:

The tools were reviewed for content validity by a jury of three experts in Obstetrics and Gynecologic Nursing, after which the necessary modifications were made. Reliability testing of Tool (II) was conducted using Cronbach's Alpha, yielding satisfactory values of 0.899.

Ethical consideration:

Research code: 104-c in 19/9/2024 for official permission was secured from the Research Ethics Committee at the Faculty of Nursing, Damanhour University, to validate the study and its tools. Additionally, written informed consent was obtained from the parturient women after providing a clear explanation of the study's aims and significance. The researcher emphasized that participation was entirely voluntary, with the provision to withdraw at any moment without providing a reason. Parturient women were assured of the confidentiality of their personal data, their right to privacy, and the safeguarding of data integrity.

Pilot study:

A pilot study was conducted involving 10% of the study sample (8 parturient women) who were subsequently excluded from study sample. This was undertaken to assess the clarity and applicability of the tool, as well as to estimate the duration required for women to respond to them, after which the requisite modifications were implemented.

Method

The study was accomplished according to the following phases:

Preparatory phase:

Tool (I) was designed by the researcher after a comprehensive examination of contemporary and pertinent literature. Tool (II) was adopted by the researcher following its validation in the relevant context. Approval from the vice-dean of graduate studies and research at the Faculty of Nursing, Damanhour University, was duly submitted to the pertinent authorities overseeing the study settings to obtain their informed consent for data collection, following a detailed explanation of the study's objectives.

Assessment phase:

Initially, the researchers engaged with the parturient women during the latent phase of the first stage of labor. They introduced themself and elucidated the title and purpose of the study. Subsequently, the researcher conducted individual interviews with each woman to complete tool (I). The duration required to perform the interviews typically ranged from 20 to 30 minutes, contingent upon the women's comprehension levels and their responsiveness to the inquiries.

Following this, the researchers explained the significance of adopting the hands-and-knees position for group I and the importance of the lateral position for group II.

Implementation phase:

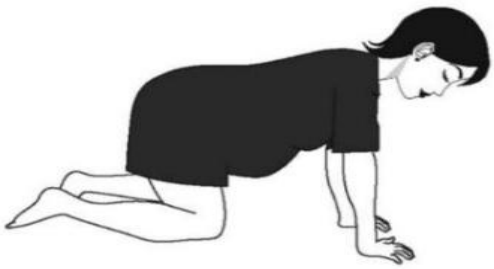
- The data collection phase extended over a period of five months, commencing in October 2024 and concluding at the end of February 2025.
- The researchers conducted visits to the aforementioned setting four days per week, specifically on Saturdays and Sundays for group I, and on Tuesdays and Thursdays for group II, from 9:00 AM to 1:00 PM.
- The researchers engaged with each woman individually in the examination room of the delivery unit, which is maintained as a clean, well-ventilated and free from distractions.
- The researchers provided comprehensive explanations and demonstrations regarding the execution of the hands-and-knees position for group I and the lateral position for group II, using videos and pictures then parturient women redemonstrated this procedure.

In Group I:

- At the commencement of the active phase of labor, with the cervix dilated to 4 cm, each parturient woman was encouraged to assume the hands-and-knees position, which involved the woman being prostrated with all four limbs positioned on the bed in a

manner reminiscent of a crawling infant **(Caughey, 2023).** In this posture, the abdomen was suspended, and the hips were aligned at a right angle to the bed. A pillow should be judiciously placed between the legs to alleviate any discomfort. This position can be maintained by the woman without vacating her labor bed **(Lamppa, 2021).**

- Women were advised to maintain this position for 15-20 minutes every hour, according to their comfort levels, with the allowance to lie down on the bed for 10-15 minutes in between, and were encouraged to resume the hands-and-knees position until full cervical dilatation was achieved to facilitate the progression of labor.



Figure(1):https://www.google.com.eg/books/edition/Labor_and_Delivery_Nursing_Second_Editio/WzbDDwAAQBAJ?hl=ar&gbpv=1&dq=hand+and+knee+position+during+labor&pg=PA152&printsec=frontcover

In Group II:

- At the onset of the active phase of labor, the cervix opened 4 cm. Each parturient woman was instructed to assume the lateral position, which entailed lying on her left side while maintaining one or both knees in a bent position and placing a pillow between the knees for comfort and to ensure the pelvis remained open **(Lamppa, 2021; Cunningham, 2023).**
- Women were advised to maintain this position for 15-20 minutes every hour, according to their comfort levels, with the provision to lie down on the bed for 10-15 minutes in between, and were encouraged to repeat the lateral position until full cervical dilation was attained to facilitate the progression of labor.

- Then the researchers systematically evaluated the progression of labor for both groups by using tool II, which involved conducting abdominal examinations to assess uterine contractions (inclusive of frequency every 10 minutes, duration, interval, and intensity) as well as the descent of the fetal head during the fifth examination; additionally, a vaginal examination was executed to evaluate cervical effacement and dilatation, the condition of the membranes, and the molding of the fetal skull.
- Subsequently, the researchers monitored vital signs, urine output, and urine composition for protein and acetone, along with the administration of pharmacological agents, intravenous fluids, and oxytocin.
- The researchers employed cardiotocography (CTG) to assess fetal heart rate (FHR) and uterine contractions for both groups. The researchers affixed and secured CTG sensors onto the maternal abdomen for a duration of 10 minutes; one sensor was strategically positioned over the fundus of the uterus to measure the frequency and intensity of uterine contractions, while the other sensor was situated over the anatomical site of the most pronounced fetal heartbeat to monitor FHR.

Evaluation phase:

The researchers conducted an hourly evaluation of labor progression for both groups utilizing Tool II.

Statistical analysis:

All statistical analyses were conducted employing SPSS version 25 for the Windows operating system. Continuous variables demonstrating a normal distribution were expressed as mean ± standard deviation (SD). Categorical variables were illustrated in terms of frequency and percentages. A one-way analysis of variance (ANOVA) was utilized for the comparative assessment among three or more groups for variables characterized by

continuous data. The chi-square test (or Fisher's exact test, as appropriate) was applied for the analysis of categorical variables. The internal consistency of the questionnaires utilized in the study was assessed through reliability testing. Statistical significance was determined at a p-value threshold of less than 0.05.

Results:

Table (1) presents the demographic characteristics of the studied sample. It was observed that 45% of participants in the hands-and-knees group and 55% in the lateral position group were aged below 30 years, with mean ages of (31.0 ± 4.7) and (29.6 ± 4.5) years, respectively. Nearly half of the participants in both groups (47.5%) had attained secondary education. Concerning occupation, 52.5% of the hands-and-knees group and 47.5% of the lateral position group were employees. The majority of participants in both groups (80.0% and 87.5%, respectively) lived in nuclear families. Regarding residence, 77.5% of the hands-and-knees group and 72.5% of the lateral position group resided in urban areas. Statistical analysis revealed no significant differences between the two groups concerning age, educational level, occupation, family type, or residence.

According to Table (2), no statistically significant differences were observed between the two groups regarding the frequency of uterine contractions per 10 minutes during the 1st and 2nd hours (P = 0.844 and P = 0.368, respectively). However, a statistically significant difference emerged during the 3rd and 4th hours (P = 0.033 and P = 0.012, respectively). Furthermore, a highly statistically significant increase in the frequency of uterine contractions was observed between both groups during the 5th and 6th hours (P < 0.001).

The mean duration of uterine contractions (in seconds) increased progressively over time in both the hands-and-knees and lateral position groups. No significant differences were detected between the two groups during the 1st and 2nd hours (P = 0.261 and P = 0.086, respectively); however, significant differences were found during the 3rd and 4th hours (P = 0.012 and P < 0.001, respectively), with highly significant differences observed during the 5th and 6th hours (P < 0.001).

Additionally, contraction intervals progressively shortened over time in both groups, with the hands-and-knees position demonstrating significantly shorter intervals from the 3rd hour onward, reaching high statistical significance by the 6th hour (P < 0.001).

Table (3) demonstrated that there were no significant differences between the hands-and-knees and lateral position groups regarding the intensity of uterine contractions during the 1st and 2nd hours. However, during the 3rd and 4th hours, statistically significant differences were observed between the two groups, as 75% of participants in the hands-and-knees position group exhibited severe uterine contractions. By the 5th and 6th hours, all participants (100%) in the hands-and-knees group experienced severe contraction intensity compared to only 30% in the lateral position group, indicating a highly statistically significant difference between the two groups (P < 0.001).

Table 4) revealed that there was no statistically significant difference between the two groups regarding cervical dilatation during **1st &2nd** hours. During the **3rd** hour, both groups had a statistically significant difference concerning cervical dilatation. During the **4th& 5th &6th** hours, a highly statistically significant difference was found between the two groups, where p< 0.001.

Table (5) summarized that there was no statistically significant difference between the two groups regarding fetal heart rate. concerning descent of the fetal head, there was no statistically significant difference between both groups during 1st hour, where the mean was (4.03 ±0.42&4.10 ±0.50), respectively. During the 2nd &3rd hours, both groups showed a statistically significant difference in fetal descent, with p-values of 0.012& 0.002, respectively. During the 4th, 5th &6th hours, a highly statistically significant difference was found between the two groups, where p< 0.001. There was a highly statistically significant

difference between the two groups, p< 0.001, regarding the duration of the 1st stage.

Figure 2 showed that all (100%) of the hands and knees group had spontaneous rupture of membranes compared to the majority (87.5%) of the lateral group.

Table (1): Distribution of parturient women in both groups regarding their demographic characteristics N=80

Demographic Characteristics	Hands and Knees (n=40)		Lateral (n=40)		Chi – square / fisher's exact test	
	Freq.	%	Freq.	%	X^2	P
Age (Years)						
< 30	18	45.0	22	55.0		
30 – 35	17	42.5	13	32.5	0.933	0.627
> 35	5	12.5	5	12.5		
Mean ±SD	31.0 ±4.7		29.6 ±4.5		1.364	0.177
Occupation						
Housewife	17	42.5	14	35.0		
Worker	2	5.0	7	17.5	3.168	0.205
Employee	21	52.5	19	47.5		
Education level						
Preparatory	1	2.5	5	12.5		
Secondary	19	47.5	19	47.5	3.167	0.367
University	18	45.0	14	35.0		
Higher education	2	5.0	2	5.0		
Family type						
Extended	8	20.0	5	12.5		
Nuclear	32	80.0	35	87.5	0.827	0.363
Residence						
Urban	31	77.5	29	72.5		
Rural	9	22.5	11	27.5	0.267	0.606

*: Significant at P ≤ 0.05

Table (2): Mean of uterine contractions characteristics between parturient women in both groups using CTG N=80

	Frequency of contraction / 10 minutes		Duration of contraction (seconds)		Interval of contractions (minutes)	
	Hands and Knees Mean ±SD	Lateral Mean ±SD	Hands and Knees Mean ±SD	Lateral Mean ±SD	Hands and Knees Mean ±SD	Lateral Mean ±SD
	(n=40)	(n=40)	(n=40)	(n=40)	(n=40)	(n=40)
1st hour	2.30 ±0.78	2.27 ±0.57	19.10 ±9.51	17.25 ±4.07	5.03 ±2.12	5.90 ±2.90
Student's t – test	T=0.196, P=0.844		T=1.131, P=0.261		T=1.531, P=0.129	
	(n=40)	(n=40)	(n=40)	(n=40)	(n=40)	(n=40)
2nd hour	2.50 ±0.68	2.38 ±0.49	23.10 ±7.55	20.53 ±3.54	4.55 ±0.95	5.15 ±2.14
Student's t – test	T=0.905, P=0.368		T=1.735, P=0.086		T=1.620, P=0.109	
	(n=40)	(n=40)	(n=40)	(n=40)	(n=40)	(n=40)
3rd hour	3.30 ±0.71	3.00 ±0.51	29.00 ±8.71	25.38 ±3.82	3.10 ±0.78	3.63 ±1.25
Student's t – test	T=2.170, P=0.033*		T=2.384, P=0.012*		T=2.275, P=0.026*	
	(n=35)	(n=38)	(n=35)	(n=38)	(n=35)	(n=38)
4th hour#	3.88 ±0.58	3.34 ±0.48	40.42 ±7.60	32.23 ±3.22	2.87 ±0.80	3.36 ±1.17
Student's t – test	T=4.361, P<0.001**		T=6.073, P<0.001**		T=2.117, P=0.037*	
	(n=20)	(n=30)	(n=20)	(n=30)	(n=20)	(n=30)
5th hour#	4.55 ±0.51	3.73 ±0.73	47.50 ±6.38	39.00 ±3.80	2.65 ±0.74	3.16 ±0.85
Student's t – test	T=4.296, P<0.001**		T=5.901, P<0.001**		T=2.185, P=0.033*	
	(n=10)	(n=20)	(n=10)	(n=20)	(n=10)	(n=20)
6th hour#	4.70 ±0.48	3.80 ±0.83	56.00 ±5.16	45.75 ±4.94	2.10 ±0.42	2.65 ±0.67
Student's t – test	T=3.144, P=0.004*		T=5.279, P<0.001**		T=2.362, P=0.025*	

Table (3): Distribution of Parturient Women in Both Groups Regarding the Their Intensity of Contractions using CTG N-80

	Hands and Knees		Side Lying		Chi – square / fisher's exact test	
	Freq.	%	Freq.	%	X^2	P
1st hour	(n=40)		(n=40)		3.660	0.160
Mild	28	70.0	35	87.5		
Moderate	12	30.0	5	12.5		
Severe	0	0.0	0	0.0		
2nd hour	(n=40)		(n=40)		4.381	0.111
Mild	21	52.5	30	75.0		
Moderate	19	47.5	10	25.0		
Severe	0	0.0	0	0.0		
3rd hour	(n=40)		(n=40)		8.889	0.012*
Mild	2	5.0	0	0.0		
Moderate	32	80.0	40	100.0		
Severe	6	15.0	0	0.0		
4th hour#	(n=35)		(n=38)		9.755	0.002*
Mild	0	0.0	0	0.0		
Moderate	27	77.1	38	100.0		
Severe	8	22.9	0	0.0		
5th hour#	(n=20)		(n=30)		32.143	<0.001**
Mild	0	0.0	0	0.0		
Moderate	5	25.0	30	100.0		
Severe	15	75.0	0	0.0		
6th hour#	(n=10)		(n=20)		13.125	<0.001**
Mild	0	0.0	0	0.0		
Moderate	0	0.0	14	70.0		
Severe	10	100.0	6	30.0		

Table (4). Distribution of Parturient Women in Both Groups Regarding the Cervical dilatation N=80

	Cervical dilatation	
	Hands and Knees	Lateral
	Mean ±SD	Mean ±SD
	(n=40)	(n=40)
1st hour	5.38 ±1.08	5.43 ±0.50
Student's t – test	T=0.531, P=0.596	
	(n=40)	(n=40)
2nd hour	5.90 ±0.90	5.58 ±0.81
Student's t – test	T=1.671, P=0.098	
	(n=40)	(n=40)
3rd hour	6.90 ±0.90	6.70 ±0.57
Student's t – test	T=2.374, P=0.020*	
	(n=35)	(n=38)
4th hour#	7.71 ±0.62	6.58 ±0.60
Student's t – test	T=7.946, P<0.001**	
	(n=20)	(n=30)
5th hour#	8.80 ±0.41	7.27 ±0.58
Student's t – test	T=10.180, P<0.001**	
	(n=10)	(n=20)
6th hour#	9.40 ±0.84	8.25 ±0.44
Student's t – test	T=4.932, P<0.001**	

Table (5): Mean of the Fetal Condition Between Parturient Women in Both Groups N=80						
Fetal condition	**Hands and Knees**		**Lateral**		**T – Test**	
	N	**Mean ±SD**	**N**	**Mean ±SD**	**T**	**P**
Fetal Heart Rate (B/M) (all not)						
1st hour	40	123.12 ±4.19	40	123.75 ±4.46	0.651	0.519
2nd hour	40	125.25 ±3.57	40	126.37 ±3.82	1.354	0.179
3rd hour	40	130.62 ±4.11	40	132.50 ±7.53	1.386	0.169
4th hour#	35	135.14 ±4.92	38	138.68 ±5.89	2.774	0.007*
5th hour#	20	142.00 ±6.37	30	146.83 ±7.93	2.278	0.027*
6th hour#	10	146.00 ±5.48	20	147.00 ±7.38	0.378	0.708
Fetal decent						
1st hour	40	4.03 ±0.42	40	4.10 ±0.50	0.678	0.499
2nd hour	40	3.60 ±0.52	40	3.90 ±0.50	2.580	0.012*
3rd hour	40	2.90 ±0.42	40	3.20 ±0.41	3.232	0.002*
4th hour#	35	2.06 ±0.34	38	2.58 ±0.50	5.176	<0.001**
5th hour#	20	1.60 ±0.42	30	2.10 ±0.52	3.586	<0.001**
6th hour#	10	1.00 ±0.31	20	1.65 ±0.51	3.685	<0.001**
Duration of labor	Mean ±SD		Mean ±SD		T	P
Duration of the 1st stage (hrs)	6.37 ±0.70		8.35 ±1.21		8.920	<0.001**

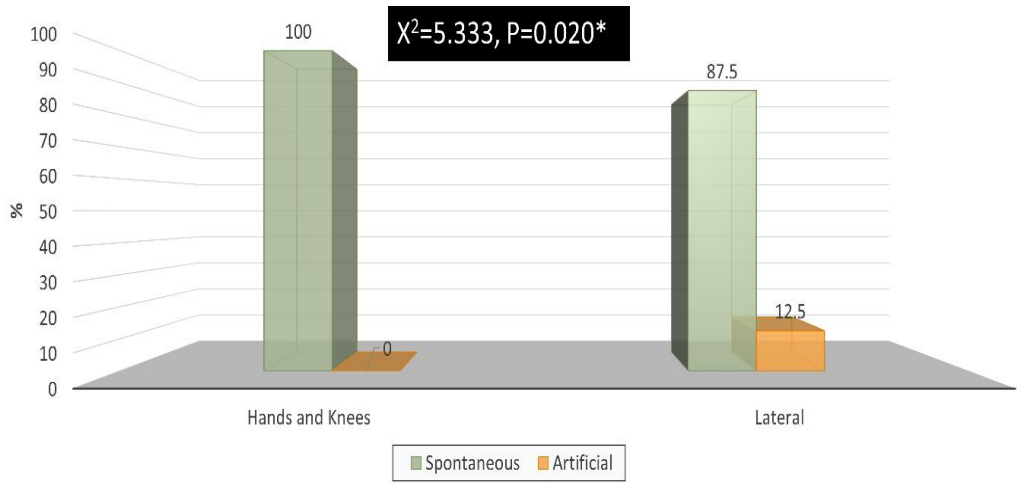


Figure (2): Distribution of Parturient Women in Both Groups Regarding Mode of Rupture of Membranes N=80

Discussion

Different positions during labor significantly impact the birthing process and associated clinical outcomes, including labor duration, perineal integrity, and the comfort of the mother **(Ahmar et al., 2025).** Nurses have a critical role in managing maternal postures during labor. Numerous studies indicate that alternative delivery positions offer a non-pharmacological method to expedite labor progression and emphasize the need for improved access to skilled birth attendants, timely interventions, and strengthened maternal health services globally **(Rathina et al., 2024).**

Women assume a variety of positions, both supine and non-supine, when given the opportunity. As a result, medical professionals should assist women in finding the most acceptable posture for them, which may include an upright position, rather than urging them to adopt the usual supine position **(Al-Dahiri et al., 2020).** As a result, this study shed light on the effect of hands and knees position versus lateral position on the progress of labor.

The findings of the present study supported the aforementioned research hypothesis that parturient women who assume the hands and knees position exhibit faster progress of labor than those who assume the lateral position. The current study discovered that women in the hands and knees and lateral groups shared similar demographic features, with no statistically significant differences. This uniformity is important for reducing extraneous factors that might interfere with the intended intervention's effect on labor progression and outcomes.

There were no statistically significant differences between the two groups on the characteristics of uterine contractions (frequency/10 minutes, duration, interval, and intensity) at the first and second hours. A statistically significant difference was seen between the two groups throughout the third and fourth hours. Furthermore, a highly statistically significant difference was seen between both groups throughout the fifth and sixth hours ($p < .001$). This was supported by the literature review, as upright positions such as sitting, kneeling, and squatting utilize the force of gravity to assist in fetal descent and improve the alignment of the baby within the birth canal. As a result, uterine contractions become stronger and more coordinated, enhancing cervical dilation and accelerating labor progress **(Blackburn, 2017).** These findings were consistent with research conducted by Zhang et al. (2016), who compared maternal and neonatal outcomes between the hands-and-knees delivery position and supine position. Their findings showed that upright positions (including standing, sitting, kneeling, and walking) during labor can benefit women by enabling effective contractions and spontaneous pushing. Additionally, this study was in accordance with a study done by Abdelbaky et al. (2023), who investigated the influence of the upright position versus the lying position on the first stage of labor among primiparous women. They revealed a statistically significant difference in childbirth progress between the groups.

Pertaining to cervical dilatation, there was no statistically significant difference between both groups during 1st &2nd hours. While in the 3rd hour, both groups had a statistically significant difference. During the 4th &5th &6th hours, a highly statistically significant difference was found between the two groups, where $p< 0.001$. This could be because uterine contractions are increased in frequency, intensity, and regularity, resulting in pressing of the head directly on the cervix, which aids in cervical dilation and effacement **(Phillippi & Kantrowitz-Gordon, 2023).** These findings aligned with those of Oktaavia et al. (2024), who examined the effects of hand and knee position on the progress of labor. They observed that the position of the hands and knees can promote the fetus's optimal rotation, cervical effacement, and complete opening. Additionally, the present study aligned with the study carried out by Ahmed et al. (2021). According to their findings, the research's mean cervical effacement and dilatation between the study and control groups from the first to the sixth hour demonstrated a very statistically significant difference (P=0.000).

In terms of fetal heart rate, there was no statistically significant difference between the two groups, since these positions alleviate pressure on the umbilical cord and enhance the fetus's heart rate rhythm. This outcome was matching with that of Zhang et al. (2016), who compared the outcomes for mothers and newborns in supine and hands-and-knees delivery positions. They showed that there was no significant difference in the rate of neonatal asphyxia or APGAR scores between the two groups. However, the current study contradicts the findings of Ahmed et al. (2021), which found a highly statistically significant difference in fetal heart rate between the study and control groups.

In terms of descent of the fetal head, there was no statistically significant difference between both groups during 1st hour, where the mean was (4.03 ±0.42&4.10 ±0.50), respectively. During the 2nd &3rd hours, both groups showed a statistically significant difference in fetal descent, with p-values of 0.012& 0.002, respectively. During the 4th, 5th &6th hours, a highly statistically significant difference was found between the two groups, where $p<0.001$. Literature supports these findings as in the hands-and-knees position, the pelvic inlet and outlet widen, especially the posterior diameter, giving more room for the fetal head to descend, thus enhancing engagement and descent of the fetal head **(Blackburn, 2017; Levy et al., 2021).** These findings were in line with a study conducted by Al Aryani et al. (2022), which

evaluated the influence of upright (hand and knee position) and recumbent position on labor outcomes. They found that individuals in the upright position group made more progress toward fetal descent than those in the recumbent position group.

The present study showed that all of the hands and knees group had spontaneous rupture of membranes compared to the majority of the lateral group. Because in the hands-and-knees position, gravity and pelvic widening help the fetal head descend deeper into the pelvis. As the head applies stronger, more direct pressure on the lower uterine segment and membranes, it increases the chance of spontaneous rupture of membranes **(Levy et al., 2021).**

Concerning the duration of labor, there was a highly statistically significant difference between both groups, as the hands and knees position has a shorter duration of labor than the lateral position during the first stage of labor. This may attribute that hands-and-knees posture relieves back pain and reduces compression on major blood vessels, improving uteroplacental blood flow, which promotes optimal oxygen delivery to the uterus, improving contraction effectiveness, and reducing labor duration **(Caughey, 2023).** This finding was matched with three studies, including: **First**, Imaniar et al. (2023), who investigated the influence of upright position on pain and duration of the active phase of the first stage of labor. Their results revealed that there was a statistically significant difference in the duration of the active phase of labor between the upright position and the supine position. **Second**, Lawrence et al. (2013) evaluated maternal positions and mobility during the first stage of labor, and proposed that upright positions in the first stage of labor decreased the duration of labor. **Third**, Zhang et al. (2016) reported that upright postures resulted in shorter first stage of labor.

On the contrary, the current study was inconsistent with that of Rani et al. (2025), who investigated the effects of the upright position during the first stage of labor on maternal outcomes. They discovered no statistically significant difference between the study and control groups throughout the first and third stages of labor. Also, the current study differed from the results of Guittier et al. (2016), who reported that maternal position did not affect delivery duration. This is supported by the fact that the current study is based on a normal-sized fetus with an occipito-anterior position.

Conclusions:

The findings concluded that parturient women who assume the hands and knees position experience faster labor progress and better maternal outcomes compared to those who assume the lateral position.

Limitations

Hands-and-knees position is not typically applied in delivery settings

Recommendations

Based on the outcomes of the current study, we recommend:

- Raise awareness of women regarding the advantages of the hands and knees position to facilitate delivery and enhance maternal outcomes.
- Implement the hands-and-knees delivery position in various settings (bed, land, or water birth).
- Apply the hands-and-knees position on women with cephalopelvic disproportion and breech delivery.
- Integrate the hands and knees position into the policies of Maternity healthcare facilities, thus enhancing clinical care practices.
- Conduct educational programs for midwives and nurses on various delivery positions and their implications for supporting better intrapartum care to women.
- Integrate the hands and knees position into the obstetrics and gynecology curricula across various educational settings.

Further research:

- Execute a replication of the present investigation within a multicenter context, employing an expanded sample size to enhance the applicability of the results.
- A study on the hands-and-knees position is needed to enhance maternal and newborn outcomes.

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