

## **Effect of Kinesio Tape on Postpartum Low Back Pain and Functional Disability in Women after Cesarean Section**

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### **Abstract:**

**Background:** Postpartum low back pain (PLBP) is a prominent health problem which commonly affects women worldwide. About 30 to 78 percent of women experience LBP, which is considered a prevalent musculoskeletal problem during pregnancy and its relieve post-delivery is very slow and often incomplete. **Aim:** of the study: to evaluate the effect of kinesio tape on postpartum low back pain and functional disability in women after cesarean section. **Design:** A quasi-experimental research design (non-equivalent control group pre-test post-test design) was utilized. **Subjects:** A purposive sample of 80 post Cesarean women. **Setting:** the outpatient obstetrics and gynecologic department of Mansoura University Hospital, Dakahlia Governorate, Egypt. **Tools:** Data was collected through three tools, basic data Structured Interview Questionnaire, Numerical Pain Rating Scale, and Roland-Morris Dysfunction Questionnaire. **Results:** the mean of low-back pain intensity decreased to  $6.45 \pm 1.13$  in the study group compared to  $7.42 \pm 1.10$  in the control group 3 days after intervention and to  $3.17 \pm 1.31$  in the study group compared to  $4.82 \pm 1.17$  in the control group 7 days after intervention. In addition, the mean of functional disability was noticed in the study group to become  $3.77 \pm 0.83$  while it is  $8.40 \pm 0.84$  in the control group 7 days after intervention. **Conclusion:** Kinesio tape (KT) significantly improves low back pain during postpartum period and enhances women's functional abilities. **Recommendations:** It is suggested that maternity nurses should encourage the use of Kinesio tape for postpartum low back pain.

**Keywords:** Cesarean Section, Functional Disability, Kinesio Tape & Low Back Pain Postpartum.

### **Introduction**

According to the World Health Organization (WHO), the postpartum period initiates within an hour after placental delivery, and it encompasses the subsequent six weeks. It is referred to as puerperium, postnatal or fourth trimester of pregnancy (Organization et al., 2022). This period represents a critical and challenging transitional time in a woman's life, as well as for her infant and family. It is marked by dramatic physiological, psychological and social adaptations posing massive demands on woman's resilience and capability to adapt (Al-Zahrani et al., 2021; Omran et al., 2020). Correspondingly, high quality postnatal care is a crucial long-term investment in the future health and well-being of women, their newborns and the entire family (Burnett-Zieman et al., 2021). Unfortunately, women's needs during this time have been overshadowed by the emphasis placed on pregnancy and labor. This overshadowing fails to acknowledge the reality that a considerable number of maternal morbidities transpire during the postpartum phase. (Hababa & Assarag, 2023). Many physical as well as psychological discomforts may arise during

postpartum period, one of them is low back pain (LBP) which is commonly experienced by most of puerperal women. It is defined as axial or para-sagittal discomfort or pain in lower lumbar region and it is musculoskeletal in nature (Ha et al., 2019; Kanase & Patil, 2022; Nahas et al., 2018)

Postpartum low back pain (PLBP) is a prominent health problem which commonly affects women worldwide. About, 30 to 78 percent of women experience LBP, which is considered a prevalent musculoskeletal problem during pregnancy and its relieve post-delivery is very slow and often incomplete (Manyozo et al., 2019). More than 50% of women with pregnancy-related LBP continue to experience symptoms 12 months after delivery, and up to 20% may continue to experience symptoms for three years or more after giving birth (Chen et al., 2019)

The incidence of low back pain is much higher after cesarean section compared to normal vaginal delivery where the likelihood of LBP for a female who had cesarean delivery with epidural anesthesia is 3.6 times more than LBP for a female who had vaginal delivery. Nowadays, cesarean section (CS) is one of the most popular abdominal surgeries for women, recently the birth of the child by lower segment

cesarean section delivery is increasing and a lot of mothers have a complaint of low back pain after delivery (Antoine & Young, 2021; Dwivedi & Verma, 2023; Tariq et al., 2020)

PLBP after cesarean section may be due to combination of multiple factors such as pregnancy-related weight gain that causes biomechanical changes in the body, including a shift in the center of gravity, alterations in posture, the development of lordosis, direct pressure on the lumbosacral nerve roots as a result of the uterus's larger size, muscular exhaustion, referred pain, and pressure on musculoskeletal system structures. In addition, the musculoskeletal system undergoes tremendous anatomical and physiological changes due to the increased release of relaxin and progesterone hormones during pregnancy and labor which lead to increased laxity and mobility of the joints (Hanafy et al., 2020). PLBP may also be due to the use of spinal anesthesia throughout labor which leads to acute spasm of muscles of the spinal region. Besides, pressure during labor puts the abdominal muscles, pelvis, and the hip joints in their maximum level of strain, leading to tension on the back and the sacroiliac joints. Enlarged lactating breasts and weakened abdominal wall muscles may also contribute to poor posture and backache during postpartum period (Tafler et al., 2022). Moreover, weakened abdominal muscles which results from cesarean section incision or from diastasis recti also have a considerable role in increasing the intensity of back pain after delivery. Some breastfeeding positions, alterations in posture whilst holding the baby, and routine bending and twisting movements have the potential to induce micro tears within the supportive musculature and ligamentous structures of the spine ultimately, leading to a vicious cycle of inflammation, pain, and disability (Brooks et al., 2020; Bryndal et al., 2020; Tafler et al., 2022 & Xue et al., 2021).

Today, the standard of care for low back pain in postpartum women includes pharmacological and non-pharmacological methods. Pharmacological methods can include analgesics, anti-inflammatory drugs, and muscle relaxants. However, most of these drugs have some limitations and adversely affect the baby during lactation. Consequently, the adoption of non-pharmacological techniques is required, such as relaxation, back exercises, acupuncture, exercises, supports or braces such as the use of Kinesio tape (Hanafy et al., 2020; Rishi et al., 2022)

Kinesio tape (KT) is a non-invasive, therapeutic tape developed in 1973 by the Japanese chiropractor Kenzo Kase. Kinesio tape is an adhesive elastic rubber band in the form of tape assumed to overcome musculoskeletal problems. It is constructed entirely of

cotton fiber and is temperature-sensitive, water resistant and air permeable structure so it can remain on the skin for three days and free from latex, medications, or chemical ingredients so it can be used safely and effectively. It is applied to patient skin under tension and can be lengthways extended to 140% of its original length (de Brito Macedo et al., 2019; Khobragade et al., 2019 & Xue et al., 2021) Kinesio tape is a technique based on the body's natural healing process, it works by stimulating the nervous and circulatory systems. This technique primarily derives from the science of kinesiology; therefore the same "kinesio" muscles are responsible for controlling the body's movements as well as the venous blood and lymph flow. It is used for supporting, rehabilitating, modulating some physiological processes and can treat a wide range of musculoskeletal problems, such as pain, injuries, dysfunction, and other disorders, without restricting the mobility of joints. Besides, it may correct joint dislocation, provide muscle support, activate the endogenous analgesia system, and eliminate congestion and effusion. KT may inhibit muscle overextension, relieve muscular spasm and fatigue, and improve joint stability (Alahmari et al., 2020; Khobragade et al., 2019; Mohamed, 2022; Tezel et al., 2020)

### **Significance of the study:**

Statistical evidences shows that postpartum low back pain is prevalent after caesarean section in more than 70 percent of cases, which means that 7 out of 10 women who give birth suffer from low back pain afterwards (Mrs. Jyoti Kumari, 2023). The high prevalence of low back pain (LBP) is a burden on the world population and is considered the leading cause of functional disability. Postpartum low back pain frequently ignored, due to the motherhood responsibilities, women tend to neglect it and continue. The overall fatigability and functional disability lead to low quality of life which could affect women's physical and mental health leading to alteration in functions, social activities, job fulfillment and socioeconomic status and may result in serious health problems if not managed timely (Kanase & Patil, 2022). Some recent clinical studies on PLBP have shown a significant improvement in pain and functional disability in participants who underwent management with Kinesio tape (Mohamed et al., 2018; Rishi et al., 2022) However, the evidence is still scarce (Chamnankrom et al., 2021; Kanase & Patil, 2022). Therefore, this study was conducted to furnish an evidence-based foundation for the effect of kinesio tape on postpartum low back pain and functional disability in women after cesarean section.

**Aim of the study:** This study aimed to evaluate the effect of kinesio tape on postpartum low back pain and functional disability in women after cesarean section.

**Study hypothesis:** Post cesarean women who apply kinesio tape exhibit less low back pain intensity and improved functional disability than those who don't.

### Subjects and Method

**Design:** A quasi-experimental research design (non-equivalent control group pre-test post-test design) was utilized to accomplish this study.

**Setting:** This study was conducted at the outpatient unit of obstetrics and gynecologic department in Mansoura University Hospital, Dakahlia Governorate, Egypt.

**Subjects:** A purposive sample of 80 postpartum women were chosen from the previously mentioned setting according to the following inclusion criteria:

- Post cesarean women with low back pain.
- Aged between 18-35 years.
- Free from any medical or gynecological health problem.

**However, women who have any of the following conditions were excluded from the study.**

- Neurological symptoms or pregnancy complications.
- Previous back surgery.
- Serious back injury (known or suspected rheumatologic or orthopedic problems such as spine

injuries, scoliosis, ankylosing spondylitis, rheumatoid arthritis, or inter-vertebral disc pathology).

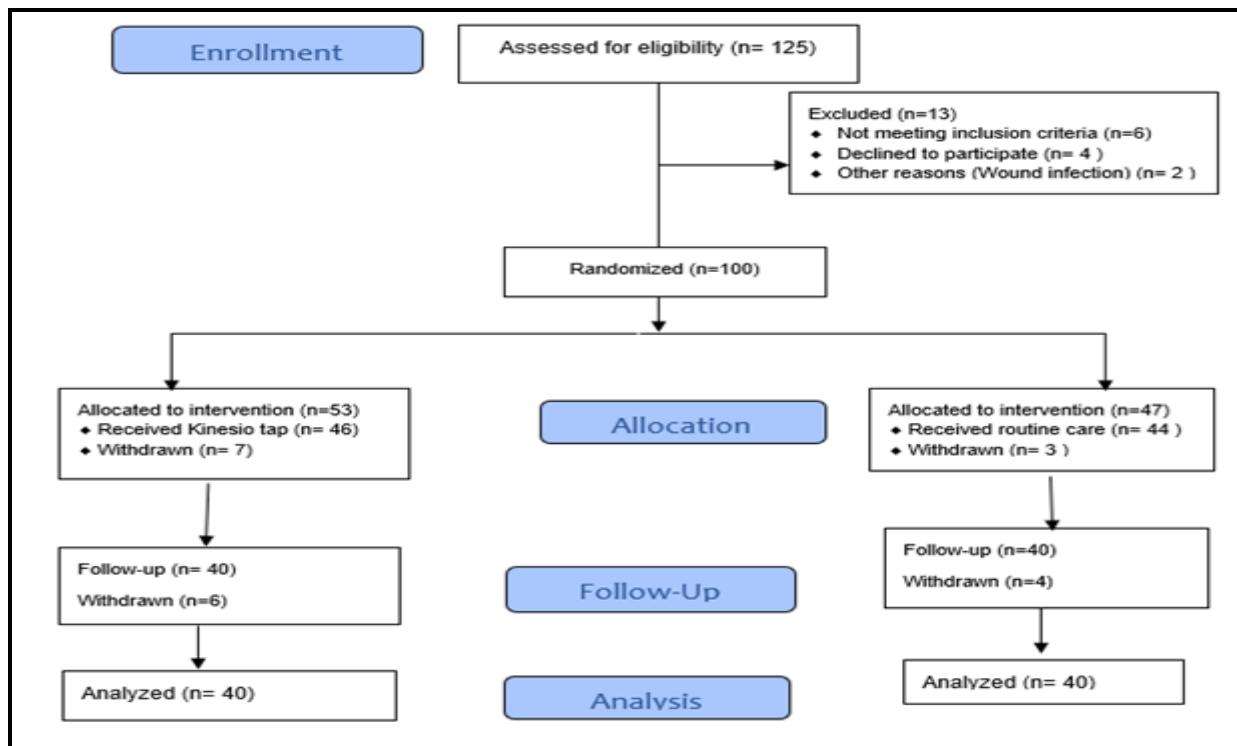
- History of vertebral column problems such as (infection in the vertebral column, vertebral fractures, spinal surgery, osteoporosis, scoliosis)
- Unilateral or bilateral lumbar muscle tension.
- Known spinal/congenital deformities.
- Allergic reaction to Kinesio tape.
- Psychiatric diseases.
- The researchers interviewed 125 women who attended the previously mentioned setting to identify those who meet the previously mentioned inclusion criteria. The detected participants were 100 women. 80 women from them agreed to participate and continue the study steps.

**The study subjects were allocated equally into two groups:**

- The study group comprised 40 postpartum women, who applied kinesio tap.
- The control group comprised 40 postpartum women, who received routine care.

### Sample Size determination:

The Epi Info statistical program version 7 was utilized to estimate the sample size for postpartum women, by applying the following parameters: population size of 90 per month, expected frequency of 50%, acceptable margin of error of 5%, and confidence coefficient of 95%. The minimal sample size required was determined to be 74. The total sample size is 80 postpartum women.



**Figure (1): Flow Chart of participants' enrollment process**

**Data Collection:**

The researchers used three tools to gather the necessary data:

**Tool one: Basic data Structured Interview Questionnaire**

It involved two parts:

**Part 1:** Personal data such as age, education, occupation, and residence

**Part 2:** Reproductive history such as gravidity, parity, number of abortions, and number of living children.

**Tool two: Numerical Pain Rating Scale:**

It was developed by (McCaffery & Beebe, 1989) and used by researchers to allow participants to rate their level of low back pain from 0 -10 orally or by putting a mark on the line representing it. It is ranked into four categories: 0= (no pain), 1-3= (mild pain), 4-6= (moderate pain) and 7-10= (severe pain).

**Tool three: Roland-Morris Dysfunction Questionnaire (RMDQ).**

It was developed by (Roland & Morris, 1983) to assess the short-term changes of low back pain before and after treatment, and it is a specific scoring scale for the assessment of functional disability.

The questionnaire consists of 24 questions closely related to low back pain. For each question, "yes" =1 point, and "no" =0 point. The total score ranges from 0 (no disability) to 24 (maximum disability).

**Field Work:****First phase (Preparatory phase):**

- An ethical approval from the ethics committee of Mansoura University, Faculty of Nursing was obtained on 13 November 2022 before conducting the study.
- An official permission for data collection was obtained from the responsible authorities of the study setting after explanation the study objective.
- Tool one was developed by the researchers, while tool two & three was adopted.
- The tools have been evaluated for content validity by a panel of three expert professors in the field of maternity nursing and some modifications were done accordingly.
- Tools two and three were checked for reliability using Cronbach's alpha test & both were reliable. The result was (0.78) for tool two and (0.79) for tool three.

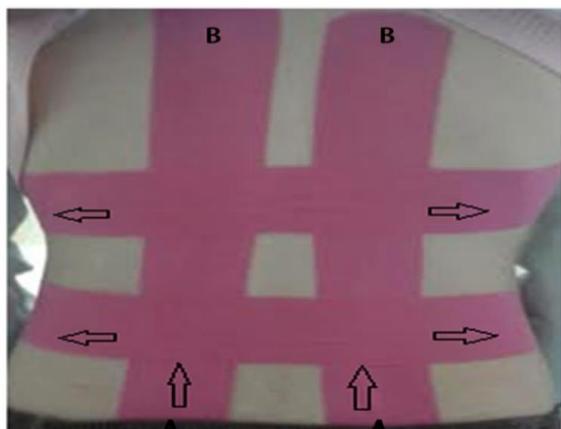
**Pilot study:**

A pilot study was conducted on a group of eight postpartum women (excluded from the study sample) to assess the feasibility of the study and ensure the clarity and applicability of the study tools over time. Following the pilot study, the tools underwent significant revisions and have been reconstructed to achieve a state of readiness for use.

**Second phase (Implementation phase):**

- Data was collected over a period of 3 months, commencing from the beginning of December 2022 till the end of February 2023.
- Data of tool one was collected individually from postpartum mothers upon arrival to the outpatient department for suture removal after one week of delivery through an interview schedule before intervention.
- The researchers measured low back pain intensity and the degree of functional disability for both groups before intervention, using tools two and three.
- Every woman in the study group was instructed clearly about the nature of therapeutic kinesio taping and its effect to gain their confidence and cooperation throughout the study period.
- Kinesio tape was applied two times per week after delivery starting after the 7th day when the woman came to remove the sutures of C.S wound or for follow up. The KT was applied for 3 days then removed for one day and reapplied for an additional 3 days.
- Before the beginning of the treatment session, each woman was encouraged to empty her bladder for more relaxation, then to stand up comfortably.
- The affected area is wiped with cotton soaked with alcohol to clean it before the application of the tape, as the skin should be dry and free of any lotions or oils.
- The researcher cut two long-strips and the corners of the tape were rounded so they didn't stick with clothes.
- The Kinesio Tape includes three I-shaped Kinesio bands with a 5 cm width and 0.5 mm thickness. Two bands, one on each side of the lumbar spine (bilaterally on the paravertebral muscles of the lumbar spine) were vertically applied from the lower posterior superior iliac spine of the Sacrum 1 (S1) to the level of the Thoracic 12 (T12), the remaining band was attached horizontally over the most painful area.
- Each woman was asked to perform trunk flexion or to bend forward to put the lower back muscles in a position of maximum stretch with rotation in the opposite direction to the application. The base of the kinesio tape was applied by the researcher at the level of S1 with no tension, and then very light tension (15–25% of possible tension) was applied. The researcher stopped the tension and laid the end down without tension at the level of T12 when the tail of the tape was about one to two inches from the end.
- Before moving the muscle from its stretched position, the applied tape was rubbed to facilitate glue adhesion as most adhesives stick better with

- heat, so rubbing kinesiotape to warm it up with friction activates the adhesive.
- The steps were repeated on the other side using the second piece of tape.
  - After applying the tape, the woman was relaxed for 20 minutes to give the tape time to fully adhere.
  - Puerperal women in the study group were advised to leave the tape on the affected area for three days before reassessment, which is the standard time recommended in clinical practice. They were instructed to remove the KT tape in case of occurrence of any skin reaction.
  - The tape remains on the skin till the next session and removed by the researcher at hospital in case that the woman was able to attend or through a home visit done by the researcher in case she couldn't come to the hospital.
  - KT was removed two hours before the next session from the top down. To minimize discomfort, this would be done in the direction of the body hair. The researcher lifted the tape from the skin by applying tension between the skin and the tape, and then pushed the skin away from the tape rather than pulling the tape away from the skin.



**Figure (2): Application of Kinesio taping. A. Starting point. B. Ending point. Arrows show the stretching directions for the vertical and horizontal applications (Kaplan et al., 2016).**

- Postpartum mothers of the control group received routine care such as warm compresses, back massage, or bed rest. No taping was applied.

#### **Third phase (Evaluation phase):**

- The researchers reassessed the intensity of back pain and the degree of functional disability for both groups 3 and 7 days after intervention using the same tools.
- Comparison between the two groups was done to evaluate the effect of kinesio tape on postpartum low back pain and functional disability in women after cesarean section.

#### **Statistical analysis:**

- The data that were collected underwent a process of categorization, coding, computerization, tabulation, and analysis through the utilization of the Statistical Package for Social Sciences (SPSS) version 25 program.
- To describe and provide a summary of the categorical variables of the two groups, statistical measures like cross tabulation were utilized.
- For the purpose of finding differences in results at a  $< 0.05$  (5%) level of significance, descriptive and analytical statistics such as percentages, mean & SD were employed, whereas the Chi square-test, Fisher Exact-test, and t-test were utilized.

#### **Ethical Considerations:**

For every woman who was enlisted, an informed written consent was procured after a thorough explanation of the study's objectives. Additionally, the utmost attention was given to their anonymity, privacy, and the freedom to withdraw from the study at any point of time, and ensuring the confidentiality of their data was reemphasized throughout the study's implementation.

## Results

**Table (1): Distribution of participants according to their personal data**

Personal data	Study group (n=40)		Control group(n=40)		t-test (P) F / $\chi^2$
	No.	%	No.	%	
<b>Age</b>					
18- <25	23	57.5	25	62.5	
25- <30	12	30	10	25	
30- 35	5	12.5	5	12.5	
<b>Mean Age:</b>	<b><math>22.47 \pm 2.9</math></b>		<b><math>21.82 \pm 3.11</math></b>		0.950 (0.343)
<b>Educational level:</b>					
- Illiterate	5	12.5	5	12.5	
- Read & write.	11	27.5	9	22.5	
- Secondary education	13	32.5	21	52.5	
- University education	11	27.7	5	12.5	4.33 (0.228)
<b>Occupation:</b>					
- Housewife	17	42.5	20	50	
- Working	23	57.5	20	50	0.453 (0.501)
<b>Residence</b>					
- Rural	19	52.8	17	22.6	
- Urban	21	47.2	23	77.4	0.202 (0.653)

t-test (P)F /  $\chi^2$ (P)

\*: Significant at P ≤0.05

\*\*: Highly Significant at P ≤0.0001

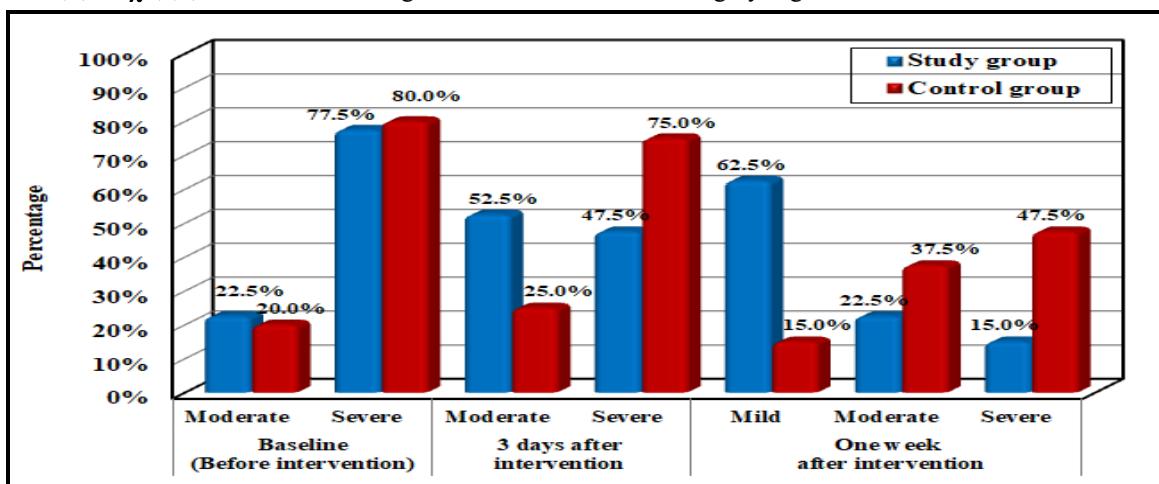
**Table (2): Distribution of participants according to their reproductive history**

Obstetric history	Study group (n= 40)		Control group (n= 40)		F / $\chi^2$ (p)
	No.	%	No.	%	
<b>Gravidity</b>					
1	14	35	14	35	
2	16	40	18	45	
More than 2	10	25	8	20	0.340 (0.844)
<b>Parity</b>					
1	13	32.5	10	25	
2	14	35	23	57.5	
More 2	13	32.5	7	17.5	4.380 (0.112)
<b>Number of living children</b>					
1 - 2	30	75	26	65	
More than 2	10	25	14	35	0.952 (0.329)
<b>Abortion</b>					
No	34	85	32	80	
Yes	6	15	8	20	346 (0.556)

(P)F /  $\chi^2$ ( P)

\*: Significant at P ≤0.05

\*\*: Highly Significant at P ≤0.0001



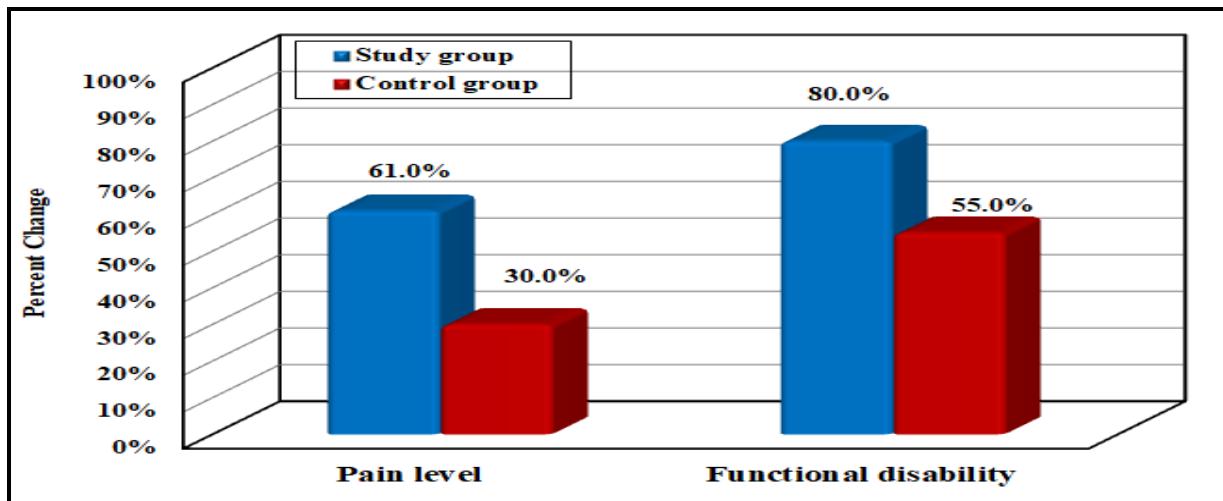
**Figure (3): Distribution of participants according to low back pain intensity**

**Table (3): Distribution of participants according to the mean of low back pain intensity**

Pain level	Study group (n=40)	Control group (n=40)	t-test (P)
	M & SD	M & SD	
<b>Baseline (Before intervention)</b>	7.50 ± 0.87	7.80 ± 0.96	1.59 (0.115)
<b>3 days after intervention</b>	6.45 ± 1.13	7.42 ± 1.10	3.89 (<0.000)**
<b>One week after intervention</b>	3.17 ± 1.31	4.82 ± 1.17	5.91 (0.000) **
<b>Before intervention and after 3 days intervention</b>	4.89 (0.000) **	2.82 (0.07**)	
<b>Before intervention and after one week of intervention</b>	17.01 (0.000) **	12.05 (0.000) **	

\*: Significant at  $P \leq 0.05$ \*\*: Highly Significant at  $P \leq 0.0001$ **Table (4): Distribution of participants according to the mean of functional disability**

Functional disability	Study group (n=40)	Control group (n=40)	t-test (P)
	M & SD	M & SD	
<b>Baseline (Before intervention)</b>	19.22 ± 0.91	18.87 ± 1.22	1.44 (0.152)
<b>3 days after intervention</b>	10.10 ± 1.27	17.35 ± 3.22	13.76 (0.000)**
<b>One week after intervention</b>	3.77 ± 0.83	8.40 ± 0.84	16.57(0.000)**

\*: Significant at  $P \leq 0.05$ \*\*: Highly Significant at  $P \leq 0.0001$ **Figure (4): Percent of change of pain level and functional disability among the studied women before and one week after intervention:**

**Table (1):** Displays that the mean age is  $22.47 \pm 2.9$  in the study group while it is  $21.82 \pm 3.11$  in the control group. Regarding the level of education, 32.5% of the study group and 52.5% of the control group had completed their secondary education. In addition, more than half of the study group (57.5%) and half (50%) of the control group are housewives. In relation to residence, 47.2% of the study group and 77.4% of the control group are urban dwellers. There were no statistically significant differences between the studied groups in relation to personal data.

**Table (2):** Presents the reproductive history of the study subjects. Regarding gravidity, it was observed that 40% of the study group & 45 % of the control group were pregnant for two times. Also, 35% of the study group and 57.5% of the control group delivered

two times. The table also shows that 75% of the study group and 65% of the control group have 1-2 children. The majority (85% & 82%) of both groups respectively had no history of abortion. There were no statistically significant differences between the study and control groups in relation to their reproductive history.

**Figure (3):** Illustrates the level of low back pain, before intervention, 77.5% of women in the study group and 80% of the control group reported severe pain. After 3 days of intervention, low back pain intensity decreased to moderate level in 52.5% of the study group and 25% of the control group. While repeating the measurement of low back pain intensity at 7<sup>th</sup> day after intervention, the pain level declined to mild among 62.5 % of women in the study group

while it was moderate in 37.5% of women in the control group.

**Table (3):** Shows the distribution of the study and control groups in relation to the means of low back pain intensity before and after intervention. Before intervention, the mean of low back pain intensity was  $7.50 \pm 0.87$  in the study group while it was  $7.80 \pm 0.96$  in the control groups, with no statistically significant difference observed between the two groups  $p=0.115$ .

3 days after intervention, the mean of low back pain intensity decreased to  $6.45 \pm 1.13$  in the study group compared to  $7.42 \pm 1.10$  in the control group.

One week after intervention, a further reduction in the mean of low back pain intensity is observed in the study group to  $3.17 \pm 1.31$  compared to  $4.82 \pm 1.17$  in the control group.

Statistically significant differences were observed between the two groups in re

**Table (4):** Displays the distribution of the study and control groups in relation to the means of functional disability before and after intervention. Before intervention, the mean of functional disability was  $19.22 \pm 0.91$  in the study group while it was  $18.87 \pm 1.22$  in the control group, with no statistically significant difference observed between the two groups  $p=0.152$ .

3 days after intervention, the mean of functional disability decreased to  $10.10 \pm 1.27$  in the study group compared to  $17.35 \pm 3.22$  in the control group with a statistically significant difference was observed where  $p=0.000$

One week after intervention, a satisfactory reduction in the mean of functional disability was noticed in the study group to become  $3.77 \pm 0.83$  while it is  $8.40 \pm 0.84$  in the control group with a statistically significant difference was observed where  $p=0.000$ .

**Figure (4):** Displays the percentage of change in pain level and functional disability before and one week after intervention in both the study and control groups. It is observed from the figure that the percent of change in pain level was 61% in the study group while it was 30% in the control group.

In relation to the percent of change in functional disability, it was 80 % in the study group compared to 55% in the control group one week after intervention.

## Discussion:

Postpartum period is very challenging for women, in most women; back pain is the main cause for decreased functional mobility. Low Back Pain (LBP) is considered to be the most salient feature during this period **Rishi et al. (2022)**. Approaches for managing PLBP include pharmacological treatments, which are helpful, but their side effects usually overshadow their benefits, as well as nonpharmacological

approaches which are safe, inexpensive, have minimal side effects, accepted worldwide, and practiced on large scales in numerous conditions. Kinesio tape is one of the safe non-pharmacological methods of musculoskeletal pain management. As a non-invasive form of treatment, kinesio tape possess a high degree of acceptability and presents no harm to the human body **Kanase & Patil (2022)**. Therefore, this study aimed to evaluate the effect of kinesio tape on low back pain and functional disability in postpartum women after cesarean section.

The results of the current study discovered that puerperal women, who applied kinesio taping experienced less low back pain and improved functional disabilities. This may be attributed to the fact that Kinesio taping reduces pain through activating endogenous anesthesia as it stimulates mechanoreceptors and through pain gait mechanism. Kinesio-taping theory is grounded on the neurophysiological mechanisms and the effect of mechanical stimuli on different body systems **El-Refaye et al. (2016)**. In relation to the Central Nervous system (CNS), the mechanical stimulus created when Kinesio tape is applied on the skin with varying degrees of stretch activates an afferent pathway to CNS. In addition, the pressure produced on the skin may be able to trigger mechanoreceptors (myelinated nerve fibers). This stimulus interacts with CNS and modulates pain responses as it inhibits the transmission of pain according to the gate control theory. Skin mechanoreceptors activation results in local depolarization and nerve impulses transmission to the central nervous system by afferent fibers (**Banerjee et al., 2019; Liu et al., 2020; Mohamed, 2022**)

Additionally, the application of Kinesio tape enables the micro valves to open due to dynamic pressure variation because of alteration in skin density stimulating skin receptors with neural sensory input, therefore decreasing the sensory input of pain, and enhancing its capacity to lessen mechanical stimulation of soft tissues during lumbar movement so, it helps in pain reduction. The lymphatic flow in the dermis is also activated and improved by this decompression, resulting in a reduction of tissue swelling and inflammation. Kinesio tape is used to stretch the skin over the tense and knotted muscles, when the area is decompressed, pain receptors send a new signal to the brain, consequently tension in the pain site is decreased and flexibility increased due to the combination of kinesio tape and manual pressure. It is also helping to add additional support to joints and muscles which decreases functional disability (**Mady, 2018; Mutoharoh et al., 2021; Xue et al., 2021**).

Concerning postpartum low back pain, the present study revealed that there was no significant difference between the kinesio tape and control group before intervention, while there were highly significant differences after intervention at different time measurements [3rd and 7<sup>th</sup> days] to the favor of kinesio tape group.

It is worthy of note that Kinesio taping is an effective method to combat postpartum low back pain and may provide a safe complement to other therapies. In parallel, **Mohamed (2022)** evaluated the effect of kinesio taping on postpartum coccydynia and found that kinesio taping group demonstrated a statistically significant decrease in coccyx pain ( $P= 0.001$ ) than the control group. **Rishi et al. (2022)** claimed that KT Group proven significant improvement in pain parameters indicating reduction in low back pain intensity in post-partum women. Additionally, the current finding is also consistent with Shahbazi et al. (2022) who found that KT is a safe and affordable technique that can be used as a complementary therapy for low back pain in pregnant women.

A study of **Xue et al. (2021)** revealed relatively similar findings that KT has a positive effect on the improvement of low back pain during pregnancy. The finding also, relatively agrees with a study of **Mutoharoh et al. (2021)** who came to the conclusion that third trimester low back pain in pregnant women can be reduced with pregnancy exercise combined with Kinesio taping. Furthermore, this finding coincides with a study carried out by **Hanafy et al. (2020)** who found a statistically significant decrease in postnatal low back pain severity on favor of kinesiotaping group when compared with acupressure group.

Additionally, the result is in harmony with a study done by **Khobragade et al. (2019)** who declared that Kinesio taping can be used to treat the pain of sacroiliac joints. Again, **Mohamed et al. (2018)** reported that Kinesio tape can be suggested to treat women's postpartum back pain effectively. Moreover, the results matches with a study of Draper et al. (2019) who revealed that pain intensity was decreased from 9 to 4 degrees when kinesio tape is applied to the lumbosacral regions. The finding also coincides with a study of **Gangwal ( 2018 )** who found that kinesio taping can be used combined with exercises in treatment for postnatal low back pain. Also, it is somewhat aligned with a study of **Mohamed & Alyan (2018)** who concluded that Kinesio taping exhibits greater efficacy than Transcutaneous Electrical Nerve Stimulation (TENS) in the reduction of pain in pregnant women with low back pain who were being treated with paracetamol. In this context **Kalinowski & Krawulska (2017)** concluded that Low back pain, functional disability

significantly decreased in pregnant women after KT when compared to placebo. They also found that therapeutic effect of KT was observed to manifest on the second day of treatment and persisted even after tape removal. The result is also partially congruent with a study of **(Wahyuni et al., 2017)** who observed that kinesio taping is efficient to reduce low back pain in late pregnancy. Moreover, it is conformed with a study of **Kaplan et al. (2016)** who deduced that Kinesio taping is a complementary approach that can be used to effectively manage pregnancy associated low back pain.

Regarding the effect of kinesio tape on postpartum functional disability, the present study disclosed no significant difference between the kinesio tape and control group before intervention, while there was a highly significant difference after intervention at different time measurements [3<sup>rd</sup> and 7<sup>th</sup> days] in the favor of kinesio tape. The study findings exhibited that Kinesio taping is a beneficial method in improving functional disability among postpartum women with low back pain after CS delivery.

Similar finding was reported by **Mohamed (2022)** who found that adding kinesio tape to the postpartum coccyx pain produced a statistically significant improvement in functional performance level. It is also compatible with a study of **Shahbazi et al. (2022)** who inferred a noteworthy improvement in walking ability in pregnant women with low back pain after KT application. In addition, it is relatively consistent with a study of **Aalishahi et al. (2022)** who concluded that Kinesio tape had a long-lasting effect after being removed and reducing the disability brought on by LBP during pregnancy. Likewise, It is nearly in line with a previously mentioned study of **Xue et al. (2021)** who concluded that KT has a significant effect on the improvement dysfunction problems.

In this respect, **Hanafy et al. (2020)** concluded kinesio taping significantly improved the lumbar range of motion when compared to acupressure in postnatal mothers with LBP. The current finding also agrees with a previously mentioned study of **Mohamed et al. (2018)** who concluded that there was a statistically significant increase of Back Pain Function Scale (BPFS) in favor of kinesio taping with exercise group than exercise group only. Furthermore, it is relatively consistent with a previous study by **Mohamed and Alyan (2018)** who concluded that Kinesio taping has been proven to be more effective than TENS in decreasing disability in pregnant women complained of low back pain and treated with paracetamol.

In contradiction with the current finding, **Khobragade et al. (2019)** found that K-taping is not effective in the improvement of functional disability

in postnatal women with sacroiliac joint pain. In addition, it disagrees with a previously mentioned study of **Gangwal ( 2018 )** who found that kinesio taping didn't improve the functional disability in women after normal delivery.

Finally, it was evident from the results of the current study that KT plays a role in decreasing LBP and leads to a significant improvement of functional disability. It is also simple in application and has no side effects.

### **Implications for Nursing Practice**

In consideration of the substantial evidence suggesting that low back pain during the postpartum period is a debilitating symptom, this current study has demonstrated that kinesio-taping application serves as an effective and simplistic alternative nursing intervention that mitigates the effects of such pain without any negative repercussions on the newborn baby. Moreover, this intervention is cost-effective and has the potential to reduce medical expenses. Additionally, it can be easily administered by nursing staff at healthcare facilities or even implemented at home.

### **Conclusion:**

Kinesio tape (KT) significantly improves low back pain during postpartum period and enhances women's functional abilities.

### **Recommendations:**

- Maternity nurses should increase the awareness of post caesarian women about the positive effect of kinesio tap on pain relieve through designing & disseminating a brochure about the beneficial effects of applying kinesio tape to puerperal women after cesarean delivery.
- Including kinesio tap as one of the routine hospital care for low back pain after cesarean deliveries.

### **Further Research should be carried out to:**

- Compare the effect of using kinesio tap for both women after normal vaginal and cesarean deliveries.
- Evaluate the effect of Kinesio tap for other types of musculoskeletal pain in women.
- Replicate the study on larger samples and in different settings to enable a broader generalization of the findings.

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### **Conflict of Interest Disclosure**

Researchers declared that there is no conflict of interest in the research.

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