

Impact of Instructional Guidelines regarding Kinesio Tape on Postpartum Back Pain, Fatigue, and Disability in Women with Cesarean Section

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Abstract

Background: Postpartum back pain, fatigue, and disability are prominent health problems that commonly affect women worldwide. About 30 to 78 percent of women experience back pain, which is considered a prevalent musculoskeletal problem during pregnancy and its relief post-delivery is very slow and often incomplete. **Aim:** To determine the impact of instructional guidelines regarding Kinesio Tape on postpartum back Pain, fatigue, and disability in women with cesarean section. **Design:** A quasi-experimental research design (pre-and post-test) was utilized. **Subjects:** A purposive sample of 100 post-cesarean women. **Setting:** The study was applied in the outpatient obstetrics and gynecologic department of Sohag University Hospital, Egypt. **Tools:** Tool (I): Structured Interview Questionnaire, Tool (II): Numerical Pain Rating Scale, Tool (III): Fatigue Assessment Scale, and Tool (IV): Roland-Morris Dysfunction Questionnaire. **Results:** The study revealed that the mean back pain intensity was less in the study group than in the control group one week post-application and 14 days post-application. Highly statistically significant differences and reductions were detected between fatigue mean scores in the study group and in the control group one week post-application and 14 days post-application at ($P = <0.001$). In addition, the mean of disability was improved in the study group than the control group one week post application and 14 days post application. **Conclusion:** The current study concluded that instructional guidelines regarding Kinesio Tape have a positive effect on reducing postpartum back Pain, fatigue, and disability in women with cesarean section. **Recommendations:** It is suggested that maternity nurses should encourage the use of Kinesio tape for postpartum back pain and fatigue in women with cesarean section.

Keywords: Back pain, Cesarean section, Fatigue, Instructional guidelines, Disability, Kinesio tape, Postpartum

Introduction:

The postpartum period, as defined by the World Health Organisation (WHO), begins within an hour of placental delivery and lasts for the following six weeks. Puerperium, postnatal, or fourth trimester of pregnancy are terms used to describe it (Organisation et al., 2022). This stage of a woman's life symbolizes a crucial and difficult time of change for her, her child, and her family. Dramatic physiological, psychological, and social adjustments are a hallmark of it, placing enormous demands on a woman's adaptability and fortitude. Likewise, investing in high-quality postnatal care is essential for the long-term health and well-being of women,

their newborns, and the entire family (Burnett-Zieman et al., 2021).

Unfortunately, the focus on pregnancy and labor at this time has eclipsed the needs of women. This overshadowing ignores the fact that a significant proportion of maternal morbidities occur during the postpartum period. Low back pain which is a frequent complaint among most pregnant women, is one of the many physical and psychological discomforts that may develop during the postpartum period. It is described as being musculoskeletal in character and axial or para-sagittal discomfort or pain in the lower lumbar area (Hababa and Assarag, 2023)

Postpartum back pain is a prominent

health problem that frequently affects women worldwide, a serious health issue. LBP is a common musculoskeletal condition that affects between 30 and 78 percent of pregnant women, and it usually goes away extremely slowly and only partially after birth. More than half of pregnant women who have back pain still have symptoms 12 months after giving birth, and up to 20% of them may have symptoms for three years or more (**Manyozo et al., 2019**)

The risk of low back pain for a female who had a cesarean delivery with epidural anesthesia is 3.6 times higher than Low back pain for a female who had a vaginal delivery. This is because the incidence of Low back pain is substantially higher following a caesarean section compared to normal vaginal delivery. Today, lower-segment caesarean section deliveries are becoming more common, and many mothers report experiencing low back pain after giving birth. Caesarean sections (CS) are one of the most common abdominal procedures for women today (**Dwivedi & Verma, 2023; Tariq et al., 2020**).

Back pain after cesarean section may be due to a 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 leads to increased laxity and mobility of the joints (**Hanafy et al., 2020**).

Back pain may also be due to the use of spinal anesthesia throughout labor which leads to acute spasms of muscles of the spinal region. Besides, pressure during labor puts the abdominal muscles, pelvis, and hip joints at

their maximum level of strain, leading to tension in the back and the sacroiliac joints. Enlarged lactating breasts and weakened abdominal wall muscles may also contribute to poor posture and backache during the postpartum period (**Tafler et al., 2022**).

Moreover, weakened abdominal muscles which result 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 (**Xue et al., 2021**). Fatigue is "an unpleasant, persistent, subjective sensation of physical, emotional, and/or cognitive tiredness or exhaustion" (**Armstrong & Gilbert, 2018**).

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 required, such as relaxation, back exercises, acupuncture, exercises, supports or braces such as the use of Kinesio tape (**Rishi et al., 2022**)

Kinesio tape 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 (**Morris et al., 2013**). 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 (**Alahmari et al., 2020**;

Khobragade et al., 2019 & Xue et al., 2021)

The kinesio tape method which is based on the body's natural healing mechanism, stimulates the neurological and circulatory systems to work. This method essentially stems from the science of kinesiology; hence, the same "kinesio" muscles are in charge of regulating venous blood and lymph flow in addition to the body's movements. It can cure a variety of musculoskeletal issues, including pain, injuries, dysfunction, and other disorders, without limiting joint movement. It is utilized for maintaining, rehabilitating, and modifying specific physiological processes. In addition, it might fix a dislocated joint, bolster muscles, turn on the body's natural painkillers, and get rid of congestion and effusion. It may reduce muscle spasms and fatigue, ease muscle cramping, and enhance joint stability (Mohamed, 2022; Tezel et al., 2020)

Significance of the study:

Seven out of ten women who give birth experience low back pain thereafter, according to statistical evidence, which indicates that postpartum back pain is common following caesarean sections in more than 70% of cases. Back pain affects a large portion of the world's population and is regarded as the main cause of functional disability. Due to the demands of parenting, women typically ignore postpartum back pain and let it persist. Overall fatigability and functional disability result in low quality of life, which may have an impact on women's physical and mental health and change their functioning, social activities, employment satisfaction, and socioeconomic level. If these issues are not promptly addressed, they may also cause major health issues (Jyoti Kumari, & Brincy Babu, 2023). Some recent clinical studies on back pain have shown a significant improvement in pain and functional disability in participants who underwent management with Kinesio tape. However, the evidence is still scarce (Kanase & Patil, 2022).

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. Many studies have examined the effects of Kinesio taping in nonpregnant patients with nonspecific back pain. However, limited clinical experience and documentation are showing the effectiveness of Kinesio taping in alleviating back pain. Existing treatments for postpartum back pain are not adequately identified and are not considered reliable by patients and clinicians. Kinesio taping will be a potential treatment if it is proven effective and tolerable. Therefore, this study was conducted to determine the impact of instructional guidelines regarding Kinesio tape on postpartum back Pain, fatigue, and disability in women with cesarean section.

Aim of the study:

This study aimed to determine the impact of instructional guidelines regarding Kinesio tape on postpartum back Pain, fatigue, and disability in women with cesarean section.

Research hypothesis:

Applying kinesio tape post caesarean delivery reduces low back pain intensity, fatigue, and functional disability compared to those who don't.

Subjects and Method:**Research design:**

A quasi-experimental research design (pre-and post-test) was used to achieve the aim of this study.

Setting:

The study was applied in the outpatient obstetrics and gynecologic department of Sohag University Hospital.

Subjects:

A purposive sample of 100 post-cesarean women was selected from the previously mentioned setting according to the **following criteria**

Inclusion criteria:

- Post- Post-cesarean-section women experiencing low back pain.
- Women their Age between 18 and 35.
- Free from any gynecological or medical health issues.

The study subjects were divided equally into two groups:

- The study group consisted of 50 postpartum women, who applied kinesio tap.
- The control group consisted of postpartum women, who received routine care.

Sample Size determination:

The following settings were used in the Epi Info statistical program version 7 to determine the sample size for postpartum women: population size of 90 each month, expected frequency of 50%, allowable margin of error of 5%, and confidence coefficient of 95%. It was decided that 94 samples would be the bare minimum needed. There are 100 postpartum women in the entire sample.

Exclusion criteria:

- Neurological symptoms or pregnancy complications.
- Previous back surgery.
- History of vertebral column problems
- Known spinal/congenital deformities.
- Allergic reaction to Kinesio tape.
- Using sedatives
- Women from them agreed to participate and continue the study steps

Data Collection:

The researchers used four tools to gather the necessary data:

Tool (I): 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 (II): 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 (III): Fatigue Assessment Scale

This measure, a 10-item rating scale that was independently constructed, was adapted from **Kleijn et al., (2011)** which assesses the fatigue level of individuals during various activities in a week in terms of physical, social, psychological, and spiritual domains and its relationship with time of the day). With a total score range of 0 to 100, scores might be anywhere from 0 (no weariness) to 10 (worst possible). No weariness, hardly any, light, moderate, severe, and worst are denoted by 0, 1, 9, 10, 31, 60, 61, 80, and 81, respectively. With a Cronbach's alpha of 0.81 for the overall score, the scale's reliability is regarded as good.

Tool (IV): Roland-Morris Dysfunction Questionnaire (RMDQ):

It was developed (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 points. The total score ranges from 0 (no disability) to 24 (maximum disability).

Field Work:**Data was collected through the following faces:****I-Preparatory phase:**

- Before beginning the study, the Sohag University Faculty of Nursing's ethics committee gave its approval.
- Official permission for data collection was obtained from the responsible authorities of the

study setting after an explanation of the study objective.

- The researchers created tool (I), whereas tools (II), (III), & (IV) were adopted.
- A group of five academics with extensive experience in the field of maternity nursing examined the instruments for content validity, and no revisions were made.
- The Cronbach's alpha test was used to assess the reliability of tools two and three, and both results were positive. For tool (II), the outcome was (0.78), and for tool (IV), it was (0.84).

Ethical Considerations:

Before the research started, the researchers met both medical and nursing directors of the selected settings to clarify the purpose of the study and get their approval. Written consent was obtained from postpartum women to gain their cooperation. The aim of the study was explained and the expected outcomes from the implementation of the study were included in this letter to obtain permission for data collection. The objective of the study was explained to postpartum women. The researchers informed the postpartum women that, the study was voluntary; they were allowed to refuse to participate in the study. Women had the right to withdraw from the study at any time, without giving any reason. Postpartum women were assured that their information would be confidential and used for research purposes only.

Pilot study:

A pilot study was conducted on 10% (ten postpartum women) of the total sample to test the clarity and feasibility of the research process and ensure the clarity and applicability of the study tools over time. No modifications were carried out to develop the final form of the tools. Patients who were in the pilot were included in the research study.

II-Implementation phase:

- Data was collected over two months, starting from the beginning of July 2023 till the end of August 2023.
- Data from tool (I) was collected individually from postpartum women upon arrival to the outpatient department for suture removal after one week of delivery through an interview schedule before intervention.
- The researchers measured back pain intensity, fatigue, and the degree of disability for both groups before the intervention, using tools (II), (III), and (IV).
- To boost each woman's confidence and participation during the study time, the study group gave each of them a brief introduction to kinesio tape and its effects.
- Kinesio tape was put on twice one week following delivery, beginning when the woman arrived to have the sutures taken out of her C.S. wound or for follow-up, and one more after two weeks. Kinesio tape was initially applied for three days, then it was taken off for one day, then it was reapplied for three more days.
- Each patient was instructed to stand up comfortably before the therapy session to allow for better relaxation.
- Before applying the tape, the affected region is cleaned with cotton that has been soaked in alcohol since the skin needs to be dry and free of any lotions or oils.
- The tape's corners were rounded by the researcher and sliced into two long strips so they wouldn't attach to clothing.
- Three I-shaped Kinesio bands with a 5 cm width and 0.5 mm thickness are included in the Kinesio Tape. From the lower posterior superior iliac spine of the sacrum 1 (S1) to the level of the thoracic 12 (T12), two bands, one on each side of the lumbar spine (bilaterally on the paravertebral muscles of the lumbar spine), were vertically applied. The final band was attached horizontally over the region that hurt the most.
- Each woman was instructed to flex her trunk or lean forward so that her lower back muscles were stretched to their utmost extent while rotating in the opposite direction of the application. The researcher first applied a very light tension (15–25% of the maximum tension) on the Kinesio tape's base at the level of S1. At the level of T12, the researcher released the tension and laid the tape's end down flat when the tail was one to two inches from the end.

- To improve glue adhesion, the affixed tape was rubbed before the muscle was released from its stretched state. Since most adhesives adhere better when heated, rubbing kinesio tape to warm it up with friction activates the adhesive.
- Using the second piece of tape, the processes were repeated on the opposite side.
- The woman reclined for 20 minutes after applying the tape so that it could thoroughly attach.
- The normal duration indicated in clinical practice is three days, thus pregnant women in the study group were instructed to leave the tape on the afflicted area for that length of time before being reassessed. In the event of any skin reaction, they were told to remove the Kinesio tape.
- The tape is left on the skin until the following session and is then removed by the researcher, either during a hospital visit if the woman was able to attend or a home visit if she was unable to.
- Two hours before the following session, KT was eliminated from the top down. This would be done in the direction of the body hair to reduce discomfort. The skin was pushed away from the tape rather than pulled away from it by the researcher after lifting the tape from the skin by providing tension between the skin and the tape.
- Postpartum women in the control group received standard treatment such as warm compresses, back massages, or bed rest. There is no tape was applied.

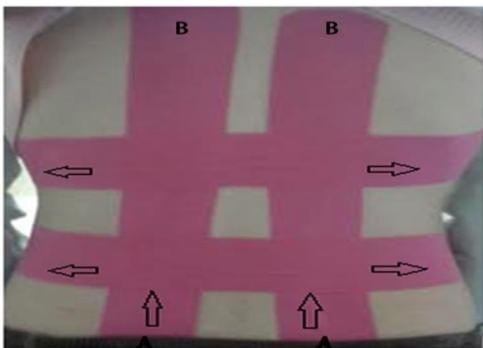


Figure (2): Application of Kinesio taping. A. Starting point. B. Ending point. Arrows show the stretching directions for the vertical and horizontal applications (Kaplan et al., 2016).

III-Evaluation phase:

- The researchers reassessed the intensity of back pain, fatigue, and the degree of disability for both groups 7 and 14 days after intervention using the same tools to determine the impact of instructional guidelines regarding Kinesio tape on postpartum back Pain, fatigue, and disability in women with cesarean section

Statistical analysis:

- The data that were collected underwent a process of categorization, coding, computerization, tabulation, and analysis through the utilization of the StatisticalPackage 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. To find 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.

Results

Table (1): Displays that the mean age is 23.33 ± 2.6 in the study group while it is 21.24 ± 2.56 in the control group. Regarding the level of education, 32% of the study group and 34% of the control group had completed their secondary education. In addition, more than half of the study group (44%) and half (50%) of the control group are housewives. About residence, 58% of the study group and 56% of the control group are from rural areas. There were no statistically significant differences between the studied groups about personal data.

Table (2): Presents the reproductive history of the study subjects. Regarding gravidity, it was observed that 40% of the study group & 42% of the control group were pregnant two times. Also, 36% of the study group and 42% of the control group delivered two times. The table also shows that 70% of the study group and 62%

of the control group have 1-2 children. The majority (80% & 84%) of both groups respectively had no history of abortion. There were no statistically significant differences between the study and control groups about their reproductive history.

Figure (1): Illustrates the level of low back pain, before intervention, 75% of postpartum women in the study group and 70% of the control group reported severe pain. Post 7 days of intervention, back pain intensity decreased to moderate levels in 56% of the study group and 35% of the control group. While repeating the measurement of low back pain intensity at two weeks post-intervention, the pain level declined to mild among 65 % of postpartum women in the study group while it was moderate in 17% of women in the control group.

Table (3): Shows the distribution of the study and control groups about the means of low back pain intensity before and after intervention. Before intervention, the mean of low back pain intensity was 7.33 ± 0.56 in the study group while it was 7.67 ± 0.46 in the control groups, with no statistically significant difference observed between the two groups $p= 0.116$. Seven days after the intervention, the mean of low back pain intensity decreased to 6.21 ± 1.07 in the study group compared to 7.33 ± 1.6 in the control group. Two weeks after the intervention, a further reduction in the mean of low back pain intensity is observed in the study group to 3.04 ± 1.42 compared to 4.73 ± 1.09 in the control group. Statistically significant differences were observed between the two groups.

Table (4): Shows the distribution of the study and control groups about the means of fatigue before and after intervention. Before intervention, the mean of **fatigue** was 29.50 ± 2.47 in the study group while it was 29.33 ± 2.21 in the control groups, with no statistically significant difference observed between the two groups $p= 0.113$. Seven days after the intervention, the mean of **fatigue**

decreased to 19.43 ± 1.55 in the study group compared to 25.64 ± 4.05 in the control group. Two weeks after the intervention, a further reduction in the mean of **fatigue** is observed in the study group to 14.04 ± 1.56 compared to 23.33 ± 4.02 in the control group. Statistically significant differences were observed between the two groups.

Table (5): Displays the distribution of the study and control groups about the means of functional disability before and after intervention. Before intervention, the mean of functional disability was 20.33 ± 0.78 in the study group while it was 19.98 ± 1.45 in the control group, with no statistically significant difference observed between the two groups $p=0.142$. 3 days after the intervention, the mean of functional disability decreased to 11.22 ± 1.23 in the study group compared to 16.43 ± 3.12 in the control group with a statistically significant difference 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 3.69 ± 0.67 while it is 9.39 ± 0.69 in the control group with a statistically significant difference observed where $p= 0.000$.

Figure (2): Displays the percentage of change in functional disability pre-, one week, and two weeks after intervention in both the study and control groups. It is observed from the figure that there is a change in functional disability, it was 55 % in the study group compared to 35% in the control group pre-intervention, which became 75 % in the study group compared to 50% in the control group one week after intervention. Finally, it improved to 85 % in the study group compared to 56% in the control group two weeks after intervention.

Table (1): Personal data distribution of the studied postpartum women

Personal data	Study group (n=50)		Control group(n=50)		t-test (P)
	No.	%	No.	%	
Age					
18- <25	27	54.0	30	60.0	0.275 (0.856)
25- <30	14	28.0	12	24.0	
30- 35	9	18.0	8	16.0	
Mean Age:	23.33 ± 2.6		21.24 ± 2.56		0.946 (0.342)
Educational level:					
- Illiterate	5	10.0	6	12.0	4.37 (0.223)
- Read &write.	15	30.0	19	28.0	
- Secondary education	17	34.0	21	32.0	
- University education	13	26.0	14	28.0	
Occupation:					
- Housewife	22	44.0	25	50	0.439 (0.503)
- Working	28	56.0	25	50	
Residence					
- Rural	29	58.0	28	56.0	0.223 (0.647)
- Urban	21	42.0	22	44.0	

t-test (P) / (P)

*: Significant at P ≤ 0.05

**: Highly Significant at P ≤ 0.0001

Table (2): Reproductive history distribution of the studied postpartum women

Obstetric history	Study group (n= 50)		Control group (n= 50)		F / (p)
	No.	%	No.	%	
Gravidity					
One	18	36.0	18	36.0	0.348 (0.833)
Two	20	40.0	21	42.0	
More than two	12	24.0	11	22.0	
Parity					
One	17	34.0	15	30.0	4.387 (0.123)
Two	18	36.0	21	42.0	
More two	15	30.0	14	28.0	
Number of living children					
1 – 2	35	70.0	31	62.0	0.967 (0.328)
More than two	15	30.0	19	38.0	
Abortion					
No	40	80.0	42	84.0	349 (0.546)
Yes	10	20.0	8	16.0	

(P)F / (P)

*: Significant at P ≤ 0.05

**: Highly Significant at P ≤ 0.0001

Figure (1): Distribution of back pain intensity levels among the studied postpartum women

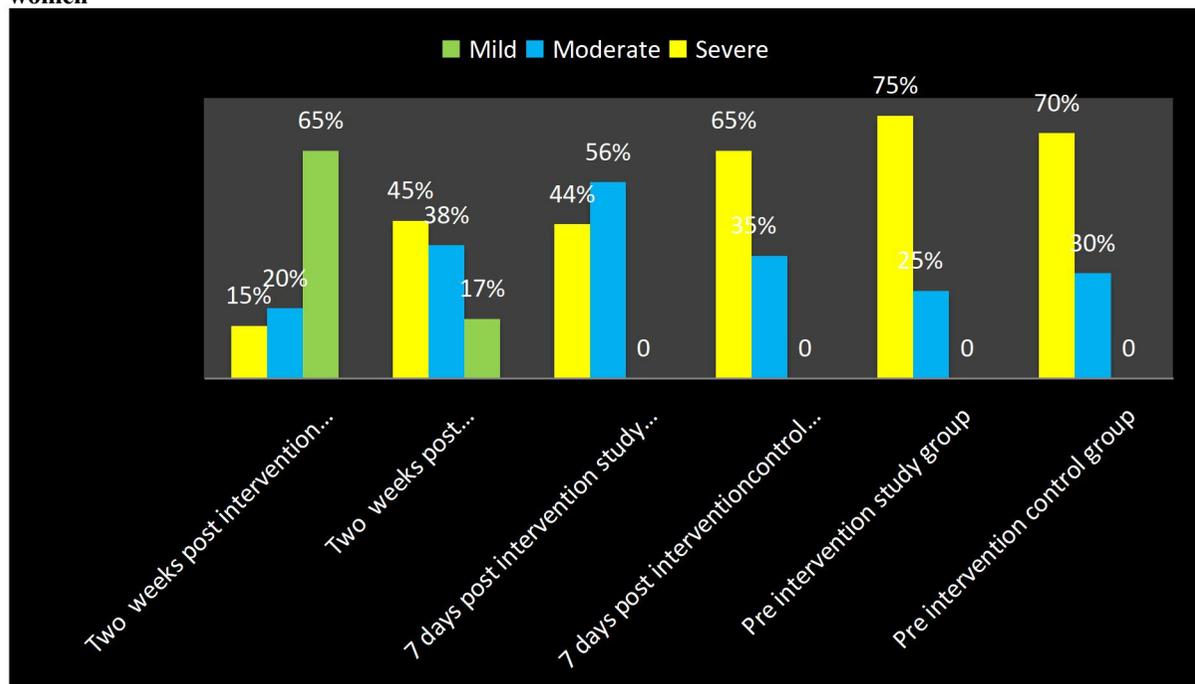


Table (3): mean score differences among the studied postpartum women according to their back pain intensity

Pain level	Study group (n=50)	Control group (n=50)	t-test(P)
	M & SD	M & SD	
Pre-intervention	7.33 ± 0.56	7.67 ± 0.46	1.59 (0.116)
7 days post-intervention	6.21 ± 1.07	7.33 ± 1.6	3.89 (<0.000)**
Two weeks post-intervention	3.04 ± 1.42	4.73 ± 1.09	5.91 (0.000)**

*: Significant at $P \leq 0.05$ **: Highly Significant at $P \leq 0.0001$

Table (4): Differences between the studied postpartum women's fatigue mean scores one week and two weeks post-intervention

Fatigue score	Study group(n=50)	Control group(n=50)	P- value
Pre-intervention	29.50 ± 2.47	29.33 ± 2.21	1.47 (0.113)
7 days post-intervention	19.43 ± 1.55	25.64 ± 4.05	4.123 (0.0001*)
Two weeks post-intervention	14.04 ± 1.56	23.33 ± 4.02	3.89 (<0.000)**

*Highly Significant at 0.0001 levels

Table (5): Mean score differences among the studied postpartum women according to their functional disability

Functional disability	Study group (n=50)	Control group (n=50)	t-test (P)
	M & SD	M & SD	
Pre-intervention	20.33 ± 0.78	19.98 ± 1.45	1.44 (0.142)
7 days post-intervention	11.22 ± 1.23	16.43 ± 3.12	14.34 (0.000)**
Two weeks post-intervention	3.69 ± 0.67	9.39 ± 0.69	17.56 (0.000)**

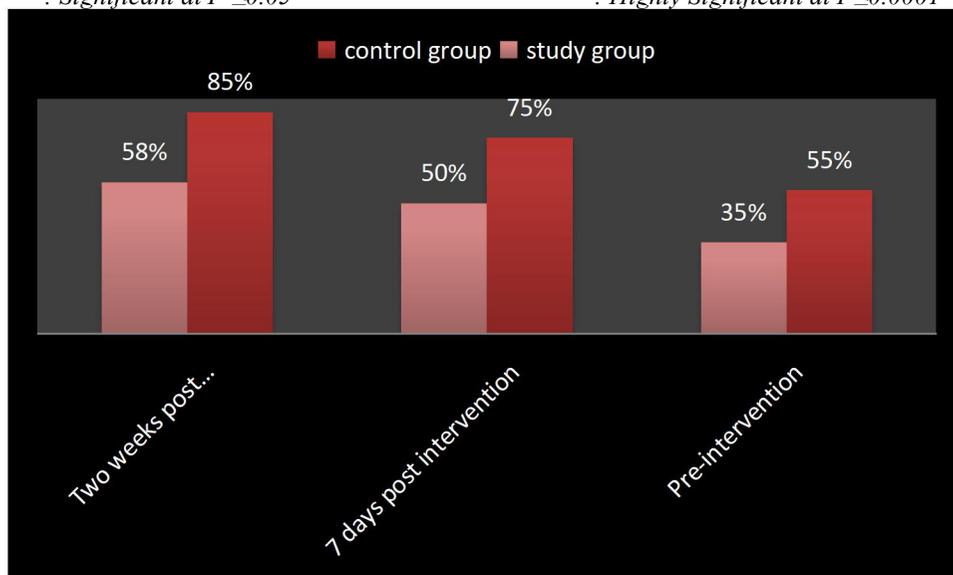
*: Significant at $P \leq 0.05$ **: Highly Significant at $P \leq 0.0001$ 

Figure (2): Distribution of functional disability among the studied postpartum women pre-intervention, one-week, and two weeks post-intervention

Discussion:

The postpartum period is very challenging for women, in most women; back pain is the main cause of decreased functional mobility. Back pain is considered to be the most salient feature during this period **Rishi et al. (2022)**. Approaches for managing Back pain 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, are accepted worldwide, and practiced on large scales in numerous conditions (**Luz et al., 2019**). Kinesio tape is one of the safe non-pharmacological methods of musculoskeletal pain management. As a non-invasive form of treatment, kinesio tape

possesses a high degree of acceptability and presents no harm to the human body **Kanase & Patil (2022)**. Therefore, this study aimed to determine the impact of instructional guidelines regarding Kinesio tape on postpartum back Pain, fatigue, and disability in women with

cesarean section.

The findings of the present study revealed that there were no statistically significant differences between the study and control group postpartum women regarding all aspects of personal data. From the researchers' point of view; it reflected the similarity of the characteristics among the sample

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 in 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 the 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 has proven significant improvement in pain parameters indicating a reduction in low back pain intensity in postpartum women. Additionally, the current finding is also consistent with **Shahbazi et al. (2022)** who found that Kinesio taping is a safe and affordable technique that can be used as a complementary therapy for low back pain in pregnant women.

A study by **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 by **Mutoharoh et al. (2021)** who concluded 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 in favor of the kinesiotaping group when compared with the acupuncture group.

The results of the current study discovered that postpartum women, who applied kinesio taping experienced less low back pain, fatigue, and improved functional disabilities, with Statistically significant differences observed between the two groups. From the researchers' point of view,

This may be attributed to the fact that Kinesio taping reduces pain through activating endogenous anesthesia as it stimulates mechanoreceptors and through the 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)**. About 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 the CNS. In addition, the pressure produced on the skin may be able to trigger mechanoreceptors (myelinated nerve fibers). This stimulus interacts with the CNS and modulates pain responses as it inhibits the transmission of pain according to the gate control theory. Skin mechanoreceptor activation results in local depolarization and nerve impulse transmission to the central nervous system by afferent fibers (**Chamnankrom et al., 2021; Mohamed, 2022**)

The possible mechanisms of **Kinesio Taping** to improve **low-back pain** include improving lower-back stability and increasing proprioception, to improve posture control (**Shin & Heo, 2020**). **Kinesio Taping** can effectively fit the skin and apply pressure, increase the space under the skin or between the dermis and epidermis, promote subcutaneous blood circulation and lymphatic reflux, and speed up the healing of the injured site through its tension, thus helping to eliminate the substances causing pain; **Kinesio Taping** can also produce continuous neural sensory input to skin receptors, thereby relatively inhibiting the sensory input of pain and improving its ability to reduce mechanical stimulation of soft tissue during lumbar movement (**Azab et al., 2020**).

Pain relief is the most important evaluation indicator in treatment because the pain will seriously affect the daily life of pregnant women. The key to relieving pain with **Kinesio Taping** is to choose the appropriate position, adjust the appropriate tension, and determine the time of adhesive tape. In addition, in the United Kingdom and the United States, the treatment of **low back pain** usually includes health education on low

back pain, starting from the first trimester of pregnancy, posture, and body mechanics education, such as the type of pillow to use when sleeping, and physical therapy. Some studies have shown that **Kinesio Taping** can effectively reduce the symptoms of **low back pain** (Kalinowski et al., 2019).

Moreover, the results match with a study by **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 by **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.

Regarding the impact of kinesio tape on postpartum women's fatigue level, the present study showed a significant difference between the kinesio tape and control group post-intervention, with a highly significant difference after intervention at different time measurements. From the researcher's point of view, it confirmed the positive effects of the kinesio tape application.

Regarding the effect of kinesio tape on postpartum women's functional disability, the present study disclosed no significant difference between the kinesio tape and control group before the intervention, while there was a highly significant difference after intervention at different time measurements [7th days and two weeks] in the favor of Kinesio tape. From the researcher's point of view, 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.

Kaplan et al., (2019) evaluated the effect of the 5-day intervention of paracetamol and the Kinesio tape and compared it against that of paracetamol alone disability. The results showed that disability improved significantly in both groups as against before the intervention, having been similar to the results of our study. Besides, the study showed that the Kinesio group was more effective than the control group in all outcomes and that the combination of the Kinesio tape with paracetamol was more effective than the paracetamol treatment alone.

Similarly, A study by Mohamed et al. (2018) reported that the combination of Kinesio tape and postural correction exercises was more effective than exercise alone. In addition, the study of Mohamed (2018) showed that the combination therapy of the Kinesio tape and paracetamol was more efficient than TENS and paracetamol in improving functional disability.

Köroğlu et al., (2020) examined the "effect of Kinesio taping on pain, functionality, and mobility endurance in the treatment of chronic low back pain". Accordingly, they showed that the effectiveness of Kinesio taping in improving functional disability in pregnant women was higher, which was consistent with the present study. Besides, the study of **Mady, (2018)** stated that the use of the Kinesio tape neither improved the function nor relieved pain in people with nonspecific low back pain. this finding could be probably explained by the fact that the Kinesio therapeutic tape restored the proper muscle tone in some cases and then maintained it by restoring the correct movement or postural patterns.

A 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 by **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 by **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 by **Xue et al. (2021)** who concluded that KT has a significant effect on the improvement of dysfunction problems.

In this respect, **Hanafy et al. (2020)** concluded that 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 by **Mohamed et al. (2018)** who concluded that there was a statistically significant increase in 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 who 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 by **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 kinesio taping plays a role in decreasing back pain and leads to a significant improvement in functional disability. It is also simple in application and has no side effects.

Conclusion:

Based on the results and hypotheses of the present study, the study findings concluded that the results support the research hypothesis in **applying** instructional guidelines regarding Kinesio Tape having positive effects on reducing postpartum back Pain, fatigue, and disability

in women with cesarean section.

Recommendations:

Based on the current study results, the following recommendations are proposed:

- It is suggested that maternity nurses should encourage the use of Kinesio tape for postpartum back pain and fatigue in women with cesarean section.
- Maternity nurses should increase the awareness of post-caesarian women about the positive effect of Kinesio tap on pain relief and fatigue
- 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.
- Replicate the study on larger samples and in different settings to enable a broader generalization of the findings.

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