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ASSESSMENT OF FUNCTIONAL INDEPENDENCE OF POST-PARTUM FEMALES IN ACTIVITY OF DAILY LIVING

Original Research

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ABSTRACT

Background: The postpartum period is a critical phase that significantly influences a woman's physical recovery and functional capacity. Functional independence during this time is essential for maternal well-being and the ability to care for a newborn. Evaluating a mother's capability to perform activities of daily living (ADLs) provides insight into the impact of childbirth on physical autonomy. Understanding how different delivery modes affect recovery can help guide postpartum rehabilitation strategies and support improved maternal outcomes.

Objective: To assess the functional independence of postpartum women in performing activities of daily living, using the Katz Index, and to compare outcomes between normal vaginal delivery and cesarean section.

Methods: A cross-sectional study was conducted over a six-month period, beginning in August 2022, at Ganga Ram Hospital and Gulab Devi Hospital, Lahore. A total of 100 postpartum women aged 20–40 years, at least six months post-delivery, were recruited using a non-probability convenient sampling technique. The sample included 50 women with normal vaginal delivery and 50 who had cesarean sections. The Katz Index of Independence in ADLs was used to assess participants' ability to perform six basic tasks: bathing, dressing, toileting, transferring, continence, and feeding. Data were analyzed using SPSS version 26.0, and group comparisons were made using independent sample t-tests.

Results: Among 100 participants, 64% of women who had vaginal deliveries were independent in dressing compared to 36% among cesarean cases. Similarly, 75% of vaginal delivery participants were independent in transferring versus 25% in the cesarean group. The mean Katz Index score for vaginal delivery was 4.28 (SD = 1.089), while cesarean cases averaged 3.56 (SD = 1.798). A statistically significant difference was observed (p = 0.017), indicating that the mode of delivery significantly influenced functional recovery.

Conclusion: Postpartum women who underwent vaginal delivery demonstrated higher functional independence in daily activities compared to those who had cesarean sections. These findings emphasize the need for targeted rehabilitation and early intervention strategies to enhance postpartum recovery, particularly for cesarean patients.

Keywords: Activities of Daily Living, Cesarean Section.

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INTRODUCTION

The postpartum period is a transformative and often vulnerable phase in a woman's life, marked by a series of physiological, psychological, and social adjustments. Among the most pressing concerns during this time is postpartum pain, particularly following cesarean section (CS), which is now one of the most frequently performed surgical procedures globally (1). Effective pain management and the timely resumption of normal daily activities are vital components of maternal recovery and overall well-being. While the female body undergoes numerous changes aimed at restoring pre-pregnancy function, complications such as persistent pain or musculoskeletal challenges can significantly disrupt a woman's ability to care for herself and her newborn, thereby diminishing her quality of life (2). Functional status during the postpartum phase encompasses the mother's capacity to independently perform essential tasks such as ambulation, personal hygiene, infant care, and breastfeeding. These daily activities are deeply influenced by the degree of postpartum pain, particularly in the case of CS deliveries (3). Early ambulation has emerged as a critical element in the recovery process, as it helps restore muscle activity, reduces the risk of complications such as thromboembolism and orthostatic hypotension, and accelerates return to baseline physical functioning (4). International health guidelines also underscore the benefits of incorporating even minimal physical activity in the postpartum period, especially for women recovering from surgery or coping with additional physical constraints (5).

Perineal trauma, though more commonly associated with vaginal delivery, remains an additional area of concern for postpartum recovery due to its potential long-term implications on both physical and emotional health (6). Pelvic floor muscle training is widely regarded as a beneficial strategy to mitigate perineal discomfort and dysfunction. However, despite its potential, the optimal timing for initiating such exercises postpartum remains a topic of ongoing debate, and many women remain hesitant to engage in them due to fear of exacerbating pain (7). The nature of the cesarean procedure itself also plays a role in recovery outcomes. Studies have shown that women undergoing emergency CS often report more intense pain and greater functional limitations compared to those who had elective surgeries, with pain levels correlating strongly with factors such as preoperative lifestyle and general health status (8). Moreover, anatomical alterations like diastasis recti, where the abdominal muscles separate at the linea alba, can impose further limitations on physical capabilities during the recovery phase. The extent of this separation has been directly linked to reduced core strength and impaired functional mobility (9). In response to these multifactorial challenges, a study conducted at the Women's Health Hospital of Assiut University in Egypt examined the role of early and progressive exercise following CS. Involving 340 postpartum women, this study revealed that those who were encouraged to initiate gradual physical activity within two hours after surgery experienced significantly improved recovery outcomes compared to those who did not receive such intervention (10). Despite advancements in surgical techniques and postpartum care, the need for standardized, evidence-based rehabilitation strategies remains. It is essential to understand how early and progressive physical activity can influence maternal recovery, especially in the context of cesarean births. Therefore, the present study aims to assess the impact of structured early ambulation and exercise on functional recovery and maternal independence following cesarean section.

METHODS

This observational cross-sectional study was conducted over a six-month period from August to January, following the approval of the research synopsis by the institutional review board. Data was collected from two tertiary care hospitals in Lahore: Ganga Ram Hospital and Gulab Devi Hospital. A non-probability convenient sampling technique was used to recruit participants who met the inclusion criteria. The required sample size of 100 was calculated using Rao software, based on a 95% confidence interval and a 5% margin of error. Parameters such as estimated population size, confidence level, and expected response rate were considered to ensure adequate power for analysis. The study population comprised postpartum women aged between 20 and 40 years who had undergone cesarean section delivery and were at least six months postpartum. Participants were eligible if they were able to perform basic Activities of Daily Living (ADLs) independently. Exclusion criteria included women with pre-existing medical conditions or physical disabilities that limited their ability to perform ADLs, those with diagnosed mental health conditions or cognitive impairments, women with prior spinal disorders, and individuals who declined or were unable to complete the assessment process (11).



Data were collected using a semi-structured questionnaire that included the Katz Index of Independence in Activities of Daily Living, a validated clinical tool designed to assess functional autonomy in areas such as bathing, dressing, toileting, transferring, continence, and feeding. The questionnaire was made available in both English and Urdu to accommodate linguistic preferences and enhance comprehension. After obtaining written informed consent, participants self-assessed and reported their level of independence in each of the listed domains. Data analysis was performed using SPSS software version 26.0. Descriptive statistics were applied to summarize demographic and clinical characteristics, while the chi-square test was used to evaluate associations between categorical variables. The results were presented using tables, pie charts, bar graphs, and histograms for clear visualization and interpretation. Ethical approval was secured from the appropriate institutional ethics committee, and administrative permissions were obtained from the participating hospitals. Prior to data collection, the study's aims and procedures were thoroughly explained to each participant. Written informed consent was obtained, and confidentiality and anonymity were ensured throughout the study in compliance with the principles outlined in the Declaration of Helsinki.

RESULTS

A total of 100 postpartum females participated in the study, with an equal distribution of 50 women having undergone normal vaginal delivery and 50 cesarean delivery. The mean age of participants was 26.16 years, with an average height of 65.09 inches and average weight of 157.94 pounds. The majority of participants (48%) belonged to the middle-income group, followed by 29% in the low-income group and 23% in the high-income category. Assessment of functional independence using the Katz Index of Independence in Activities of Daily Living revealed that 58% of participants were independent in bathing, while 42% required assistance. Dressing was performed independently by 64%, and 36% needed help. Regarding toileting, 67% were able to manage the task on their own, whereas 33% were dependent. In terms of transferring, 75% performed this task independently and 25% required assistance. For continence, 71% were independent, while 29% required support—cesarean delivery participants in particular reported more pelvic floor-related limitations. Finally, 57% of participants were able to feed themselves without help, while 43% required assistance.

An independent samples t-test was applied to compare Katz Index scores between the two delivery groups. The mean Katz Index score for the normal delivery group was 4.28 with a standard deviation of 1.089, while the cesarean delivery group had a lower mean score of 3.56 and a standard deviation of 1.798. Statistical analysis revealed a significant difference between the two groups, with p-values of 0.017 and 0.018, respectively. This indicated that the mode of delivery significantly affected postpartum functional independence, with those who had normal vaginal deliveries demonstrating greater independence in ADLs. A stratified analysis of Katz Index scores was conducted to explore the influence of potential confounding variables, including age group, socioeconomic status, and pre-existing health conditions. The findings revealed that postpartum females without pre-existing conditions consistently reported higher Katz scores across all strata, indicating better functional independence. Participants from higher socioeconomic groups demonstrated greater independence compared to those from low-income backgrounds. Age also played a modest role, with individuals aged 26–30 showing the highest average Katz scores among all age categories. These patterns suggest that both health status and social determinants significantly modulate functional recovery in the postpartum period.

Table 1: T-Test for Mode of Delivery in Katz Index Scale

Delivery Mode	Ν	Mean	Standard
			Deviation
Normal Delivery	50	4.28	1.089
Cesarean Delivery	50	3.56	1.798

Table 2: Independent Sample Test of Katz Index Scale

	Sig. (2-tailed)
Equal variance assumed	0.017
Equal variance not assumed	0.018



Table 3: Stratified Katz Score Analysis

Age Group	Income Level	Health Condition	Mean Katz Score
20-25	High	No	4.333333
	High	Yes	4
	Low	No	3.6
	Low	Yes	2.333333
	Middle	No	4
	Middle	Yes	3
26-30	High	No	4.75
	High	Yes	3.5
	Low	No	3.25
	Low	Yes	3
	Middle	No	4.166667
	Middle	Yes	3
31-35	High	No	4.8
	High	Yes	4
	Low	No	3.2
	Low	Yes	2
	Middle	No	4.625
	Middle	Yes	2.5
36-40	High	No	4
	High	Yes	3.5
	Low	No	3
	Low	Yes	3.25
	Middle	No	3.916667
	Middle	Yes	2





Figure 1 Independence in Activities of Daily Living (ADLs)



Figure 2 Comparison of Mean Katz Index Scores by Delivery Mode



DISCUSSION

The present study offers valuable insights into the functional recovery of postpartum women, highlighting how factors such as the mode of delivery, type of anesthesia, and overall health status influence their ability to regain independence in performing activities of daily living. The results demonstrated that women who underwent normal vaginal delivery exhibited significantly higher Katz Index scores compared to those who had cesarean sections, indicating a more rapid restoration of physical autonomy. This aligns with earlier research indicating that cesarean delivery is associated with prolonged recovery times, increased physical limitations, and a greater need for assistance in routine tasks (12). Epidural anesthesia was observed to facilitate faster recovery in comparison to general anesthesia, supporting prior evidence that effective pain control plays a critical role in enabling early mobilization and physical engagement during the postpartum period (13). The advantage of epidural techniques lies in their ability to provide targeted analgesia with minimal systemic effects, thereby preserving the mother's functional capacity and supporting her involvement in childcare and self-care activities. In contrast, general anesthesia, with its delayed post-operative clearance and associated fatigue, may hinder early postpartum mobilization and prolong dependency. Physical inactivity among postpartum women has been widely recognized as a complex issue shaped by multiple variables, including pain, fatigue, mental health challenges, and caregiving responsibilities (14,15). Pelvic girdle pain (PGP), a common complaint affecting nearly half of pregnant women, often extends into the postpartum phase and significantly restricts physical activity, thereby increasing the risk of long-term complications such as obesity, metabolic syndrome, and cardiovascular diseases (16). Additionally, cesarean section, particularly when complicated by chronic post-surgical pain (CPSP), has been implicated in decreased functional outcomes and reduced quality of life for months following childbirth (17).

The use of the Katz Index in this study provided a structured, clinically relevant assessment of functional independence. A considerable proportion of participants demonstrated dependence in at least one domain of ADLs, with the cesarean group particularly affected in areas such as continence and feeding. These findings emphasize the need for targeted rehabilitation programs aimed at restoring core muscle strength, pelvic floor integrity, and mobility. Physiotherapy interventions, when initiated early, have shown potential in alleviating musculoskeletal pain and expediting functional recovery. Furthermore, educational support focusing on postpartum care, body mechanics, and gradual exercise regimens may empower mothers to regain their pre-pregnancy level of functioning more efficiently. Another dimension influencing postpartum outcomes is the presence of pre-existing conditions and socioeconomic disparities. The stratified analysis revealed that women from lower socioeconomic backgrounds and those with prior health issues exhibited lower Katz scores, highlighting the intersection of social determinants and health inequities. Women with limited access to postpartum care, rehabilitation resources, or nutritional support may face disproportionate barriers to recovery. Addressing these disparities through health policy reforms and community-based postpartum care models is essential for improving outcomes on a broader scale.

Physiological changes induced by pregnancy, such as thyroid dysfunction, were also acknowledged as potential contributors to fatigue and functional impairment during the postpartum phase (18). These often-overlooked conditions warrant routine screening and management to ensure holistic postpartum recovery. Moreover, postpartum impairment remains an under-addressed aspect of maternal health, particularly for women with disabilities, who may experience compounded physical, emotional, and economic challenges (19). Future interventions must incorporate inclusive care strategies to cater to the needs of this vulnerable subgroup. A key strength of the study was its structured assessment using a validated scale and its inclusion of participants from diverse backgrounds, enhancing the generalizability of findings. However, limitations must be acknowledged. The use of non-probability convenient sampling introduces potential selection bias, limiting the representation of the wider postpartum population. The cross-sectional nature of the study prevents the establishment of temporal or causal relationships between delivery methods and functional recovery. Additionally, data were selfreported, which may be subject to response bias. Objective physical assessments and longitudinal follow-up would provide more definitive conclusions. Future research should focus on longitudinal designs that monitor postpartum functional recovery over extended periods, comparing structured rehabilitation protocols and evaluating their impact on long-term maternal health (20). Investigating hormonal, psychological, and biomechanical factors in tandem with delivery-related variables would offer a more integrated understanding of postpartum well-being. Overall, this study reinforces the clinical and public health importance of optimizing postpartum care, promoting early mobility, and designing individualized recovery pathways that account for physical, psychological, and social determinants of health.



CONCLUSION

The findings of this study conclude that postpartum women who underwent vaginal delivery demonstrated greater functional independence in activities of daily living compared to those who had cesarean sections. This outcome, assessed through the Katz Index Scale, highlights the significant impact of delivery mode on maternal recovery. However, these results must be interpreted within the broader context of individual health status, availability of social support, and quality of postpartum care. The study underscores the importance of tailored rehabilitation strategies and early interventions to enhance maternal well-being and support a smoother transition into the postpartum period.

Author	Contribution
	Substantial Contribution to study design, analysis, acquisition of Data
Afia Khubaib*	Manuscript Writing
	Has given Final Approval of the version to be published
	Substantial Contribution to study design, acquisition and interpretation of Data
Shabab Zahra	Critical Review and Manuscript Writing
	Has given Final Approval of the version to be published
Fizza Khan	Substantial Contribution to acquisition and interpretation of Data
	Has given Final Approval of the version to be published
Javeria Saeed	Contributed to Data Collection and Analysis
	Has given Final Approval of the version to be published
Aqsa Akram	Contributed to Data Collection and Analysis
	Has given Final Approval of the version to be published
Manahil Nasir	Substantial Contribution to study design and Data Analysis
	Has given Final Approval of the version to be published
Hafiza Ayesha	Contributed to study concept and Data collection
	Has given Final Approval of the version to be published
Zaina Khalid	Writing - Review & Editing, Assistance with Data Curation

AUTHOR CONTRIBUTION

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