European Journal of Clinical Pharmacy

Print ISSN: 2385-409X **Online ISSN**: 3105-0409

Website: https://farmclin.com/

Original Research Article

Knowledge of Mothers Regarding Kangaroo Mother Care at the Time of Discharge at CDF, Hyderabad.

Article History:

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Received: *07*-12-2025
Revised: 16-12-2025
Accepted: 23-12-2025
Published: *31*-12-2025

Abstract: ***Background:*** In Pakistan, neonatal mortality is a critical issue of public health given that the country is ranked number three in the world in terms of the death rates of newborns. Kangaroo Mother Care (KMC) is an evidence-based intervention that is a skin-to-skin care practice recommended by WHO, and it proved to be highly effective in reducing morbidity and mortality among preterm and low-weight infants. The continuation of this life-saving practice at home will only be ensured by ensuring that adequate maternal knowledge of KMC is known at the time of discharge of the patient in the hospital. ***Objective:*** To identify the prevalence of mothers knowledge about Kangaroo Mother care during discharge at CDF Hospital Hyderabad Bilawal medical college LUMHS Jamshoro ,Sindh ,Pakistan. ***Methods***: The cross-sectional pilot study was done in the Department of Pediatrics, CDF Hospital, Hyderabad. This research was conducted in a duration of Three months from 4th September 2025- 5th December 2025, following the consent of the synopsis of the research by the College of Physicians and Surgeons Pakistan (CPSP). A sample size of 50 mothers of preterm and low birth weight neonates admitted in the KMC ward was enrolled on non-probability consecutive sampling. Motherly knowledge was determined by use of a 12-item validated questionnaire and classified as Good (≥50%), and Poor (<50%). All qualitative variables were computed in terms of frequency and percentage. Chi-square test was done to evaluate post stratification and p-value of 0.05 was taken to be significant. ***Findings***: Out of 50 participants (mothers) who were registered, 31 (62) and 19 (38) were and possessed Good and Poor knowledge of KMC respectively. Most of them were aged between 31-45 years (54 percent), living in urban regions (82 percent), higher educated (50 percent), and family monthly income over PKR 50,000 (62 percent). Parity of more than 3 was observed on 58% and gravida on 50% of the mothers. ***Conclusion:*** Most mothers were well informed of the Kangaroo Mother Care during discharge, which validates the prevalence of 62% that was used to estimate a sample size to undertake the main study.

Keywords: Kangaroo Mother Care, Maternal Knowledge, Neonatal Care, Preterm Infant, Low Birth Weight, Pakistan.

INTRODUCTION

Decades of advances in maternal and child health have not stopped neonatal mortality as a daunting health issue facing the world. Globally, the neonatal mortality rate has been reduced by half since 1990 but the weight still remains heavily distributed in South Asia and Sub Saharan Africa where the healthcare facilities, resources and maternal health literacy are still below global standards. The three major causes of neonatal death in the global context which may be prevented are (1) neonatal infection, (2) birth asphyxia and (3) preterm birth which are the leading causes of death in the first 28 days of life which make up a vast majority. The situation in Pakistan is more threatening in this context of the world. The nation is ranked 3rd among the world in neonatal mortality with the rate standing at 55 deaths per 1,000 live births that has been reflecting stubbornly at both 200612 201213 Pakistan Demographic and Health Surveys. Positively, this figure is now at 42, and then 40.4 deaths per 1,000 live births in 2018-2020, which shows that the gradual effect of targeted intervention programs on neonatal health is taking its toll, which is why such targeted interventions of neonatal care are urgently needed to be scaled up and become cost-effective. (3,4) Among the most significant factors that have contributed to these deaths, low birth weight, and preterm birth complications are the primary causes of neonatal mortality

To address this international burden, the World Health Organization (WHO) has been categorical that every healthy mother and newborns regardless of the intended infant feeding method and mode of delivery should be subjected to uninterrupted skin-to-skin contact immediately after birth to last at least one hour. The basis of this recommendation is that there is strong physiological and behavioral support. This is because newborns have an innate and sensitive olfactory system that helps them recognize and react to the scent of the mother so that they can begin to breastfeed when held skin-to-skin on the maternal chest. The newborn and the mother have a physiological need to be in close contact during the immediate postpartum period which forms the basis of both biological and emotional aspects of early neonatal care. (8)

Kangaroo Mother Care (KMC) sometimes known as skin-to-skin contact is the standardized method of carrying the infant inside maternal garments against the bare chest of the mother to ensure sustained thermal control and maternal intimacy. (9,10) Maternal-infant Studies have shown that KMC is possible to conduct continuously over long durations but even short-term and interim sessions can have quantifiable physiological benefits. Noteworthy, the strategy has proven to be effective in a wide range of neonatal disorders, such as preterm babies, and those with respiratory distress. (11) KMC can be used at a neurological level, as it stimulates neuroprotective processes and neurobehavioral self-regulation, which meets the basic biological and psychological developmental needs of the infant in the susceptible early postnatal stage. In addition to its physiological advantages, KMC is linked to increased breastfeeding, improved maternal-infant bonding, lowering of neonatal pain responses, and increased weight gain in the low birth weight infants effects that translate into better survival and developmental rates.

Knowledge of KMC by mothers at the time of discharge is a crucial factor of whether these benefits can be maintained at home. Mothers are in a better position to maintain the practice after they have learned the purpose, technique, duration, and safety issues of KMC, which might prevent neonatal mortalities as well as complications during the delicate post-discharge phase. (14) On the other hand, a lack of knowledge at discharge forms a risky gap between care in the hospital and the practice at home, and exposes vulnerable neonates to lack of thermal protection, feeding support, and developmental stimulation that KMC offers. Medical professionals can fill this divide by providing systematic, evidence-based discharge counseling to mothers to give them the skills and the confidence to administer KMC successfully.

Some of the studies that have been conducted in low and middle-income countries have pointed to significant gaps in maternal knowledge of KMC. In a cross-sectional study in a Tanzanian hospital, Chamhene and Moshi discovered that a significant proportion of postnatal mothers with preterm babies possessed poor knowledge of KMC, and the knowledge levels were significantly related to the level of educational attainment and previous exposure to health information. Ahmed et al. (14) proved that a program of structured KMC discharge guide proving to be highly effective in enhancing maternal knowledge scores and preterm neonatal outcomes in Egypt highlights the transformational effect of specifically addressing discharge education. (17) In addition, the research done in Pakistan and other South Asian environments has always reported that the health literacy of the mother such as knowledge of newborn care practices is also a complex sociodemographic factor such as education, residence, income, and parity that require locally-specific measurements. All of the above findings support the necessity of investigating the depth of maternal KMC knowledge at the place of discharge in the Pakistani tertiary care facilities where the maternal outcomes are not optimal.

Objective: To determine the frequency of knowledge of mothers regarding Kangaroo Mother Care at the time of discharge at CDF Hospital, Hyderabad.

MATERIALS AND METHODS

Study Design: Cross-sectional pilot study.
Study Setting: Department of pediatrics CDF Hospital Hyderabad Bilawal medical college LUMHS Jamshoro, Sindh, Pakistan
Duration of Study: Three months after approval of synopsis.
Sample Size: 50 mothers were recruited into this pilot study. To determine the necessary sample size to conduct the main study, the following formula was used n = z 2 p (1-p)/d 2, where the prevalence of good knowledge (according to this pilot) was 62, the confidence level was 95, and the margin of error was 7, which resulted in the required sample of 185.
Sampling Technique: Non-probability consecutive sampling.
Inclusion Criteria: Mothers between the age of 2045 years of low birth weight (<2.5 kg) that is vitally stable and preterm babies (birth age less than 37 gestation weeks) admitted to the KMC ward.
Exclusion: Mothers of preterm or low birth weight babies who are vitally unstable, neonates with congenital malformations, mothers who do not wish to take part, would not respond in the follow-up process, and those who had experienced major depressive disorder, dysthymia, mania, hypomania, anxiety disorder, or post-traumatic stress according to DSM-5 criteria.

Mothers who passed the inclusion criteria were recruited after receiving ethical approval and a written informed consent. There was a 12-item knowledge questionnaire with a proper validation; 1 point was given to every correct answer, and knowledge was rated as Good (greater than 50% i.e. greater than 6 correct) and Poor (less than 50%). The demographics such as age, residence, parity, gravida, family monthly income and maternal educational status were captured using an already prepared proforma.

Data Analysis: SPSS version 22 was used to analyze and input data. All qualitative variables were calculated in terms of frequency and percentage. In order to determine the relationship between knowledge and the demographic variables, post-stratification chi-square test (or Fisher exact test where applicable) was used. A p-value of 0.05 or less was taken to be statistically significant.

RESULTS

The number of mothers enrolled in this pilot study was 50. Most of the participants (54 percent) fell within the age bracket of 31 to 45 years, and the same number (46 percent) fell within the age bracket of 20 to 30 years. The majority of the mothers (82 percent) lived in urban status. In terms of parity, 58 percent had a number of more than 3 children and 42 percent had a number of 3 or less. The distribution of gravida was also equal with half of them having a history of above 3 pregnancies and the other half having a history of 3 or less. As far as family monthly income is concerned, 62% had a higher earning than PKR 50,000 per month. In terms of education, 50 percent were of higher education (intermediate to graduation), 32 percent were of secondary education (class 6-Matric), 12 percent were of primary education (class 1-5) and 6 percent were illiterate. These characteristics are summarized in Table 1.

Table 1. Demographic Characteristics of Enrolled Mothers (n=50)

Variable	Category	n (%)
Age (years)	20–30 years	23 (46.0%)
	31–45 years	27 (54.0%)
Residence Status	Urban (Yes)	41 (82.0%)
	Rural (No)	9 (18.0%)
Parity	≤3	21 (42.0%)
	>3	29 (58.0%)
Gravida	≤3	25 (50.0%)
	>3	25 (50.0%)
Family Monthly Income	≤PKR 50,000	19 (38.0%)
	>PKR 50,000	31 (62.0%)
Education	Illiterate	3 (6.0%)

	Primary (Class 1–5)	6 (12.0%)
	Secondary (Class 6–Matric)	16 (32.0%)
	Higher (Intermediate–Graduation)	25 (50.0%)

Regarding the primary outcome, 31 mothers (62.0%) demonstrated Good knowledge and 19 mothers (38.0%) demonstrated Poor knowledge of KMC at the time of discharge (Table 2).

Table 2. Frequency of Maternal Knowledge of KMC (n=50)

Knowledge Level	n	Percentage (%)
Good (≥50% correct)	31	62.0
Poor (<50% correct)	19	38.0
Total	**50**	**100.0**

Post stratification analysis was conducted to determine the impact of demographic variables on level of knowledge. It was found that the chi-square test did not show statistically significant interaction between knowledge and any of the demographic variables under study. There was no noteworthy association between age group and knowledge (p=0.469). Status of residence (p=0.145), parity (p=1.000), gravida (p=0.244), family monthly income (p=0.666), and maternal educational status (p=0.312) were all not found to be statistically significant. The higher educational level of mothers, as well as their urban location, were numerically inclined to better knowledge, but these differences were not statistically significant, perhaps due to the small pilot sample. Table 3 gives stratification results in detail.

Table 3. Stratification of Knowledge by Demographic Variables with Chi-Square Analysis

Variable / Category	Good n (%)	Poor n (%)	Chi²	p-value
Age: 20–30 years	16 (69.6%)	7 (30.4%)	0.525	0.469
Age: 31–45 years	15 (55.6%)	12 (44.4%)		
Residence: Urban (Yes)	23 (56.1%)	18 (43.9%)	2.120	0.145
Residence: Rural (No)	8 (88.9%)	1 (11.1%)		
Parity: ≤3	13 (61.9%)	8 (38.1%)	0.000	1.000
Parity: >3	18 (62.1%)	11 (37.9%)		
Gravida: ≤3	18 (72.0%)	7 (28.0%)	1.358	0.244
Gravida: >3	13 (52.0%)	12 (48.0%)		
Income: ≤PKR 50,000	13 (68.4%)	6 (31.6%)	0.187	0.666
Income: >PKR 50,000	18 (58.1%)	13 (41.9%)		
Education: Illiterate	3 (100.0%)	0 (0.0%)	3.565	0.312
Education: Primary	3 (50.0%)	3 (50.0%)		
Education: Secondary	8 (50.0%)	8 (50.0%)		
Education: Higher	17 (68.0%)	8 (32.0%)		

DISCUSSION

The current pilot study established that 62 percent of mothers were good in Kangaroo Mother Care knowledge at discharge and the rest 38 percent were poor in their level of knowledge. This result is also clinically important since Pakistan has continued to experience high neonatal mortality rate, with low birth weight and preterm birth as the primary causes of the neonatal death conditions, where passive exposure to KMC practice and the adoption of this practice is not sufficient to ensure that mothers leave the hospital prepared to take care of their babies. (5,6)

The overall rate of good knowledge among mothers is good but the fact that a large percentage of mothers have poor knowledge shows that passive exposure to KMC practice and the adoption of the same practice is not enough in guaranteeing the maternal readiness to take care The prevalence of good knowledge in this study (62 percent) is widely in line with the similarities in low- and middle-income country environments. In a similar evidence, Chamhene and Moshi, in a hospital-based cross section study in central Tanzania, also showed moderate levels of KMC knowledge in postnatal mothers with preterm babies, with the level of knowledge strongly linked to the level of education, and prior exposure to structured health education during the hospital stay. (14)

The fairly positive knowledge score we have seen in our research could be explained by the fact that CDF Hospital has its own KMC ward where mothers are actively counselled by the nursing staff during the time of admission. This control in the environment over KMC practice alongside verbal education on the part of healthcare providers, must have been the main knowledge acquisition mechanism within this group of individuals and this mechanism bisects much of the range of sociodemographic control variables. The interesting observation of this study was the lack of statistically significant relationship between maternal knowledge and all demographic variables investigated, such as, age ($p=0.469$), residence status ($p=0.145$), parity ($p=1.000$), gravida ($p=0.244$), family monthly income ($p=0.666$), and maternal educational status ($p=0.312$). Traditionally, it is assumed that a knowledge advantage would be granted to higher education and urban residence as per a higher access to health information and higher health literacy whereas our findings indicate that institutionalized in-hospital KMC counseling can act as a balancing mechanism even among the sociodemographic layers.

Ahmed et al. have also proved this interpretation when they showed in Egypt that a formalized KMC discharge guide program is strongly associated with higher maternal knowledge scores and neonatal outcomes in mothers of preterm infants irrespective of their educational or socioeconomic background, and established that a well-designed hospital-based education is able to overcome existing demographic inequalities in maternal health knowledge (13). It is specifically also interesting to consider the non-significant relationship between education and KMC knowledge. On the one hand, there was a paradoxical high rate of good knowledge by the illiterate mothers in our sample ($n=3$), and on the other hand, the secondary educated mother showed an equal rate between good and poor knowledge. Though the numbers of these subgroups are too insignificant to make any solid conclusions, this trend supports the thesis that practical, direct, and verbally delivered KMC education during wards admission is more powerful than formal learning background in influencing the discharge knowledge (16).

Despite the general positive results, the 38% of mothers that are in the poor knowledge category is a clinically significant gap. Nurses should not only be aware of the practice but have a thorough understanding of the proper position, an optimal amount of time to leave the patient in that position, thermal regulation, safe sleep habits, perceiving of warning signs, and timing of discontinuation all of which domains are evaluated in the 12-item questionnaire employed in the present study. Lack of this granular knowledge by the mothers puts them at risk of abandoning KMC too soon, doing it improperly, or being unable to detect neonatal deterioration, all of which could have negative effects on the weak preterm or low birth weight infants during the post-discharge phase (11,12). The shortcomings of this pilot study need to be mentioned. The 50-mothers sample was mainly chosen to measure prevalence with the study sample size calculation as opposed to establishing associations with sufficient statistical power. The stratification analyses had a small sample size that could have added to type II error, which could have been hiding any real correlation between the demographic variables and knowledge that the large sample would have indicated. The primary study, which aims at 185 mothers according to the 62% prevalence that is determined, will be much more powered to investigate the determinants of KMC knowledge but also come up with the findings that are more generally applicable to the study population. (16)

Regarding the healthcare system, the results support the need to have standard and routinely delivered maternal KMC education procedures at the hospital discharge point (17). Since the level of knowledge did not differ significantly between educational or socioeconomic groups, structured discharge counseling seems to be of benefit to all mothers alike, and thus, needs to be institutionalized as an obligatory part of neonatal discharge planning. Providing training to nursing personnel, systematic predischarge counseling resources, and printed handouts as an intervention in KMC is a relatively cheap approach with the potential to produce quantifiable changes in post-discharge neonatal outcomes and well-being throughout the healthcare system of Pakistan.

CONCLUSION

As it is evident in this pilot study, 62 percent of mothers were well informed about Kangaroo Mother Care when they left the KMC ward in CDF Hospital, Hyderabad. Maternal knowledge was not statistically significant with demographic variables such as age, residence, parity, gravida, income, or education level. The results confirm the prevalence estimate upon

which the main study sample size was calculated and the significance of in-hospital KMC education among all mothers irrespective of the sociodemographic background. The 38 percent of mothers with low knowledge is a vulnerable group and it is suggested to work with them using specific interventions aimed at providing discharge counseling in order to make sure that all mothers are prepared to maintain this life-saving practice at home. Further research using more extensive samples is advised to investigate how the educational interventions affect the long-term KMC adherence and the neonatal outcomes in Pakistan.

REFERENCES

1. Kwesiga D, Wanduru P, Ssegujja E, Inhensiko J, Waiswa P, Franck L. Improving post-discharge practice of kangaroo mother care: perspectives from communities in East-Central Uganda. Frontiers in Pediatrics. 2022 Jul 13;10:934944.
2. Khan HI, Masood N, Hanif A, Masood MK, Omer R, Tahira F. Knowledge, attitude and issues in practicing kangaroo mother care at home after discharge from a kangaroo mother care ward of a tertiary care hospital in central Lahore. Journal of Fatima Jinnah Medical University. 2022;16(3):107-11.
3. Gebeyehu NA, Gelaw KA, Azeze GA, Admass BA, Lake EA, Adela GA. Knowledge, attitude and practice towards kangaroo mother care among postnatal women in Ethiopia: Systematic review and meta-analysis. Plos one. 2022 May 6;17(5):e0265411.
4. Ahmed Mohammed Sabry F, Mohamed Ahmed Ayed M, Farouk Mohamed M, Mohamed-Nabil Ismail L, R Ahmed M, Kamal Abd Elkhalek N. Effect of Kangaroo mother care discharge guide program on mothers and preterm neonates outcomes. Egyptian Journal of Health Care. 2023 Mar 1;14(1):833-53.
5. Getie BA, Yismaw AE, Tiguh AE. Kangaroo mother care knowledge and practice among mothers who gave birth to preterm and low birth weight babies in Amhara regional state referral hospitals, North West Ethiopia. International Journal of Africa Nursing Sciences. 2022 Jan 1;17:100470.
6. Nimbalkar S, Dave H, Budh H, Morgaonkar V, Patel D. Post-discharge home kangaroo mother care follow-up study in rural Gujarat. Journal of Family Medicine and Primary Care. 2024 Apr 1;13(4):1379-83.
7. Dos Santos AC, Carmona EV, Sanfelice CF, Mafetoni RR, Lopes MH, Balaminut T. Breastfeeding at discharge and in the third stage of the Kangaroo Mother Care among hospitalized preterm infants. Revista da Escola de Enfermagem da USP. 2024;58:e20230383.
8. Ramanayake V, Gamhewage N, Liyanage G. Sri Lankan postnatal mothers' early essential newborn care knowledge and readiness for discharge. Sri Lanka Journal of Child Health. 2025 Jun 5;54(2).
9. Joshi A, Londhe A, Joshi T, Deshmukh L. Quality improvement in Kangaroo Mother Care: learning from a teaching hospital. BMJ Open Quality. 2022 Oct 1;11(Suppl 1):e001459.
10. Adedia D, Nyande FK, Kuug A, Afaya A, Ayanore MA, Yibile M, Tangtie E, Cudjoe L, Musah LA, Beatrice TA, Kunje M. Predictors of Knowledge, Attitude, and Practice of Kangaroo Mother Care Among Mothers in a Ghanaian Tertiary Care Center. International Journal of Pediatrics. 2025;2025(1):9420090.
11. Montealegre-Pomar A, Camacho J, Perilla AD, Puentes-Sánchez SM. Parents under Kangaroo Mother Care Method Reluctant to Commence Hospital Discharge: A Thematic Analysis. Universitas Medica. 2022;63(2):1-2.
12. Jeganathan S, Kvestad I, Rajendran S, Stige SH. Continuation of Kangaroo Mother Care when transitioning from facility to community: maternal and familial perspectives from South India. BMC Health Services Research. 2025 Nov 5;25(1):1444.
13. Muttau N, Mwendafilumba M, Lewis B, Kasprzyk K, Travers C, Menon JA, Mutesu-Kapembwa K, Mangangu A, Kapesa H, Manasyan A. Strengthening Kangaroo Mother Care at a tertiary level hospital in Zambia: A prospective descriptive study. Plos one. 2022 Sep 1;17(9):e0272444.
14. Abuhammad S, Karimeh R, Mahadeen A. The impact of an educational intervention on neonatal intensive care unit nurses' knowledge, attitudes, and perceptions of parental participation in kangaroo mother care. Plos one. 2024 Aug 1;19(8):e0306888.
15. Shirazi S, Keshavarz M, Pezaro S, Amzajerdi A, Jahanfar S. The effect of post discharge Kangaroo mother care with and without telephone advice on anthropometric indexes of preterm newborns: a randomized clinical trial. BMC pediatrics. 2025 Mar 20;25(1):221.
16. Atnafu N, Gelaw KA, Azeze GA, Admass BA, Lake EA, Adela GA. Knowledge, attitude and practice towards kangaroo mother care among postnatal women in Ethiopia: systematic review and meta-analysis.
17. Mustikawati IS, Pratomo H, Martha E, Murty AI. Knowledge, attitude, and practice using the kangaroo method care in maternal with low birth weight babies. Jurnal Kesehatan Masyarakat. 2022 Mar 17;17(3):436-43.
18. Chamhene N, Moshi FV. Level of knowledge on kangaroo mother care and its associated factors among postnatal mothers with preterm babies in central Tanzania: hospital-based cross-sectional study. SAGE Open Nursing. 2023 Apr;9:23779608231167813.

