Cross-sectional Study

Awareness of mothers coming to obstetric wards of allied hospitals regarding neonatal care and the working of community health workers in their districts

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A R T I C L E   I N F O

A B S T R A C T

Introduction: Neonatal mortality remains a significant challenge not only to the world,but especially to a developing country like Pakistan. It can be majorly attributed to the sub-par healthcare, insufficient and under-recognised community health workers, and the lack of knowledge of proper newborn care on the part of the parents. This study targets the level of knowledge of the mothers and the services provided by community health care workers as the main factors determining neonatal care.

Methods: A cross-sectional study was conducted in the OBS (obstetrics) wards of Hospitals affiliated with Rawalpindi Medical University from January 2022 to June 2022. The sample size was 138. Data was collected by one-on-one interviews, using a standardized USAID Community Health Worker Assessment and Improvement Matrix questionnaire. Data analysis was done using SPSS v28. Chi-square test was applied to check for significance.

Results: Out of the total 138 participants, 47.8% (n = 66/138) were between the ages of 21–25. Results showed that women between the ages of 21–25 (P = 0.000058) and women who had their first child between the ages of 23–27 had good knowledge about neonatal care. 45% (n = 62/138) of the participants had poor knowledge of neonatal care, whereas 55% (n = 76/138) had good knowledge (P = 0.000002). As for the role of community health workers, only 20–30% of the participants were being provided with their services; hence their performance was not found to be adequate.

Conclusions: The world of medicine is moving rapidly toward a new framework of the health systems in which the real foundation will be based on what actually takes place in the community, therefore, community health workers can play an important role in improving maternal and neonatal care. Family-centered care, appropriate age of first conception and motherhood, and proper guidance to first-time parents can ensure significant improvement in neonatal care in the future.

1. Introduction

2.4 million children died in the first month of their life in 2020 – which amounts to approximately 6500 deaths every day. About a third of these neonatal deaths occurred within the first day after birth, and around three-quarters within the first week of life [1]. According to the United Nations Millennium Declaration (2000), "Reducing Child Mortality" and "Improving Maternal Health" are among the 8 Millennial Developmental Goals. Despite this, neonatal deaths remain a major public health challenge throughout the world and account for the majority of deaths occurring among children under five years of age [1]. Inspite of Pakistan's significant achievements in improving maternal and child health policies, the national mortality rate in Pakistan in 2020 was still 40.4 deaths per 1000 live births [2]. Pakistan has one of the highest newborn mortality rates worldwide [2], and the top causes are prematurity, complications during birth and severe infections. A study

shows that a staggering 75% of these deaths can be prevented by high-quality care [3].

United Nations Population Fund Representative Ms. Lina Mousa appreciated Pakistan's efforts improving maternal and child health, commenting on the lady health worker programme in Pakistan [4]. In developing countries like Pakistan where there are an estimated 0.82 physicians, 0.57 nurses and midwives, and 0.06 community health workers per 1000 population, the health care system can be dramatically improved and neonatal mortality decreased by training and supervising the community health workers [4].

Pakistan, a lower-middle income country, faces significant economic, governance, and security challenges, in addition to bearing the burden of looming debt and a fiscal deficit equivalent to 8% of the GDP [5].

Under these circumstances, Pakistan faces considerable health problems, and current progress has failed to keep pace with the international targets. Therefore, in 1994, Pakistan launched The Lady Health Worker Programme (LHWP) as part of a national strategy to improve health by bringing health services to the people,s doorsteps [6,7].

Lady Health Workers (LHWs) play a particularly important role for mothers and children; they coordinate with traditional birth attendants and midwives to ensure that the mothers receive adequate care along with educating the people about safe birth practices as well as ensuring them [4]. As one of the largest community health worker (CHW) programmes with a force of almost 110,000, the LHWP offers important lessons to the world and may present a replicable CHW model to the global community according to Harvard Institute [7,8].

In 1988 the Brazilian Government created the Sistema Unico de Saúde (SUS) or Unified Health System to provide universal care free at the point of delivery [1]. Part of this universal care programme is the Family Health Strategy – a nationally scaled model of primary care services, each covering geographically defined areas of up to 4000 inhabitants [9]. Primary Care teams are composed of a doctor, a nurse, a nurse auxiliary, and at least four Community Health Workers (CHWs), who are recruited from the local community and are responsible for up 750 people (approximately 100–150 households) in their micro-areas [9]. It is probably the most successful example of primary care reform in the world [9].

Since the 20 years of implementation of the program, there have been significant reductions in infant mortality and hospitalizations due to primary care-sensitive conditions. Moreover, improvements in screening uptake, improvements in breast-feeding uptake, antenatal care, mental health problems, and immunization coverage have been observed, which can be plausibly attributed to the programme. Additionally, it has led to improvements in health equity thus closing the gap between the rich and poor [9].

We conducted this research to determine the level of awareness of mothers regarding neonatal care so that effective policies can be devised to address the gap in knowledge. This research is also directed to assess the working of community health workers in educating the masses about neonatal care and to determine the factors which form the basis of knowledge of the mothers about neonatal care.

2. Methodology

4(A) Registration was not needed as this is a cross-sectional study, and data was obtained by the study participants by interview method after obtaining informed consent. The anonymity and confidentiality of the participants were maintained.

4(B) The synopsis of the study was submitted to the Ethical Review Board of Rawalpindi Medical University for ethical approval. However, ethical approval is not required for this study per se, as it does not involve any interventions, medical or surgical, or otherwise any inquiries that could adversely harm the health(mental or physical) of the study participants.

This study has been reported in line with the STROCSS guidelines

(Mathew G and Agha R, for the STROCSS Group. STROCSS 2021: Strengthening the Reporting of cohort, cross-sectional and case-control studies in Surgery. International Journal of Surgery 2021; 96:106165).

5(A) It was a cross-sectional descriptive study conducted in an interview-based manner.

5(B) It was conducted in the settings of public hospitals affiliated with Rawalpindi Medical University (Benazir Bhutto Hospital, District Headquarters Hospital, and Holy Family Hospital, Rawalpindi) during the year 2022. The study duration was six months, from January 2022 to June 2022.

6(A) The study population included patients admitted to the obstetrics ward of allied hospitals of RMU. All mothers of reproductive age, who had recently given birth and were nursing a neonate were included. Mothers with hearing and listening disabilities, those who were in considerable pain, and those who were unapproachable due to language barriers (did not know Urdu, English, or Punjabi) were excluded from the study.

6(C) Sample size:

(Calculated using OpenEpi Software [10]).

Sample size n = [DEFF*Np(1-p)]/[(d2/Z21-/2*(N-1)+p*(1-p)]

Sample Size = 138 with a 95% confidence interval.

6(C) Sampling technique:

The sampling technique used was non-probability convenience sampling.

2.1. Data collection tools and techniques

A standardized **USAID Community Health Worker Assessment and Improvement Matrix** [11] Questionnaire with certain modifications was used for the collection of data.

It was made mandatory that only healthcare professionals collect the data as the questionnaires contained some medical terms that needed elaboration and simplification to make them understandable for the study participants.

3. Parts

The research questionnaire began with an introductory section that explained the objective, method, and purpose of the research to the participants.

Informed consent was taken from all the participants, and confidentiality was ensured. Participation was voluntary.

● Part A consisted of demographic details.
● Part B assessed the mother's awareness about the care of neonates.
● Part C was about the role of CHWs in their district in providing basic know-how about neonatal care.

A pilot study was conducted before collecting actual data. The data of the pilot study was not included in the actual results.

3.1. Scoring

There were a total of 7 questions in Part B (section assessing the awareness of mothers about the care of neonates). A total score of 5–7 was marked 'good knowledge', a score of 1–4 was marked 'average knowledge' and a score of 0 was marked 'no knowledge'.

In Part C, there were 10 questions assessing the working of CHWs in the participants' districts. A score of 10 was marked 'excellent services', a score of 6–9 was marked 'average services', a score of 1–5 was marked 'poor services' and a score of 0 was marked 'no services'.

3.2. Data analysis

Data analysis was done using SPSS v28. Chi-square test between different variables was applied. Odds ratio and regression analysis were

also applied.

4. Results

We interviewed 138 women coming to the obstetric wards of the Allied Hospitals of Rawalpindi Medical University (Holy Family Hospital, Benazir Bhutto Hospital, and District Headquarters Rawalpindi). They came from a variety of areas belonging to the Rawalpindi district, including Gulshan Abad, Chakwal, Bhara Kahu, Chaklala Scheme 3, Sohawa, Kotli Sattian, and various other nearby districts. The Majority, 47.8% (n = 66/138), were between the ages of 21–25. Women between the ages of 21–25 had good knowledge compared to other age groups, and there was a significant relationship between the age of mothers and their understanding of neonatal care (P = 0.000058) (Table 1).

44.2% (n = 61/138) of the women had been married between the ages of 18–22. The age of the mother and knowledge of newborn care were significantly correlated (P = 0.000304), with high knowledge being more prevalent among women who got married between the ages of 18 and 22 (Table 1).

50.7% (n = 70/138) of women conceived their first child between the ages of 23–27 years. Knowledge of newborn care is significantly correlated with the age at which women had their first child (P = 0.000006), with women who conceived between the ages of 23 and 27 having strong knowledge (Table 1).

Nuclear families made up 44.9% (62/138), while joint families made up 55.1% (76/138). Neonatal care knowledge and family structure had a significant relationship (P = 0.000126), with those who lived in joint families having more knowledge than those who did not (Table 1).

5. Knowledge

In Part B, questions were asked to assess the knowledge of mothers regarding neonatal care, with the score of 5–7 was marked 'good knowledge', a score of 1–4 was marked 'average knowledge' and a score of 0 was marked as 'no knowledge'. The mean of the knowledge Score is 4.3478 (average knowledge) and the standard deviation is 1.83896. After calculating the score, we found out that 45% (n = 62/138) of the women had poor knowledge of neonatal care and 55% (n = 76/138) had good knowledge (Fig. 1).

70% of the mothers were aware of the five newborn risk indicators (neonate unable to feed, unconsciousness, convulsions, severe chest drawing, and fast breathing). 58% were aware of the antibiotic application procedure (chlorhexidine/antibiotic gel on cord stump). 73.90% knew about the danger signs for eye infections (eye discharge,

reddening, and swelling of eyes). 72% were aware of screening for metabolic problems if they run in the family, 80% were aware of the EPI immunisation schedule, and 97% were aware of exclusive breastfeeding (Table 2).

Knowledge of neonatal care and cord care practice were significantly correlated (P = 0.000002), with those with more knowledge applying chlorhexidine/antibiotic gel to the umbilical cord.

6. Community healthcare workers

In Part C, 10 questions were asked to assess the working of CHWs in their districts. A score of 10 was marked 'excellent services', a score of 6–9 was marked 'average services', a score of 1–5 was marked 'poor services' and a score of 0 was marked 'no services'.

They were asked about the services of the community health workers in their districts (Fig. 2). Excellent services were being provided in Bhara Kahu (8 women reported), Ghori Town (6 women reported), Ghareeb Abad (3 women reported), Murree (3 women reported), and Tala Gang (3 women reported). Average services were being provided in Sawan Garden (6 women reported) and Ghori Town (1 woman reported). Poor services were being provided in Pallandari (3 women reported) and Attock (3 women reported). Surprisingly, no services were being provided in Gulshan Abad, in some districts of Chakwaal, some areas of Bhara Kahu, Chaklala Scheme 3, Sohawa, Kottli Sattian, Bannu, Ghori Town, Gilgit, Pirwadhai, Thanda pani, Dhoke Gujran, Lal Kurti, Shahpur, and Kashmir (Table 3).

6.1. Multivariate logistic regression

Logistic regression was used to analyze the relationship between knowledge about neonatal care and the factors affecting it, such as type of family and the number of children. The data was normally distributed. There was no multicollinearity between the variables (P values less than 0.7). The type of family significantly predicted the knowledge about Neonatal Care (P = 0.315) and also the number of children significantly predicted the knowledge about Neonatal Care (P = 0.336).

While making the scatter plot no variables fall out the −3 or 3 either on the X or the Y axis. Also in the Normal probability graph, they fall on the line. In standards residuals, they lie between −2.015 and 2.258. Residual R2 came out to be 20.2% with Significance P = 2.4856E-7, this means that the models explain the 20.2% variance in Knowledge about Neonatal Care.

ANOVA test also showed significance (P = 2.4856E-7, F = 17.057) and the slope of the line was 0 (Table 4).

7. Discussion

The Lady Health Workers Program, launched in 1994 in Pakistan, was a success initially. Community health workers, especially in rural areas, played a significant role in decreasing neonatal and maternal mortality [12] [[,]] [13] [[,]] [14] by educating people about the cause of these deaths as well as ensuring safe birth practices. They used to conduct workshops regarding exclusive breastfeeding, maternal nutrition, family planning methods, neonatal care, etc.

But now the situation has changed. No services are being provided in many districts. Many women (around 70–80%) coming to obstetric wards of Allied Hospitals complained that no workshops are being conducted by the lady health workers in their localities, no assistance is provided for the provision of basic neonatal needs, and the health care workers are not even always available at the facilities. The reason is the decline of the program over time, and now the lady health workers are mostly underpaid and under-rewarded.

Physical violence and sexual harassment are the most pressing issues for lady health workers [15]. In the year 2018, two lady health workers were shot down while on polio vaccination duty in the city of Quetta [15]. In the year 2011, a worker died during demonstration and clashes

Table 1
Demographic details of the participants.

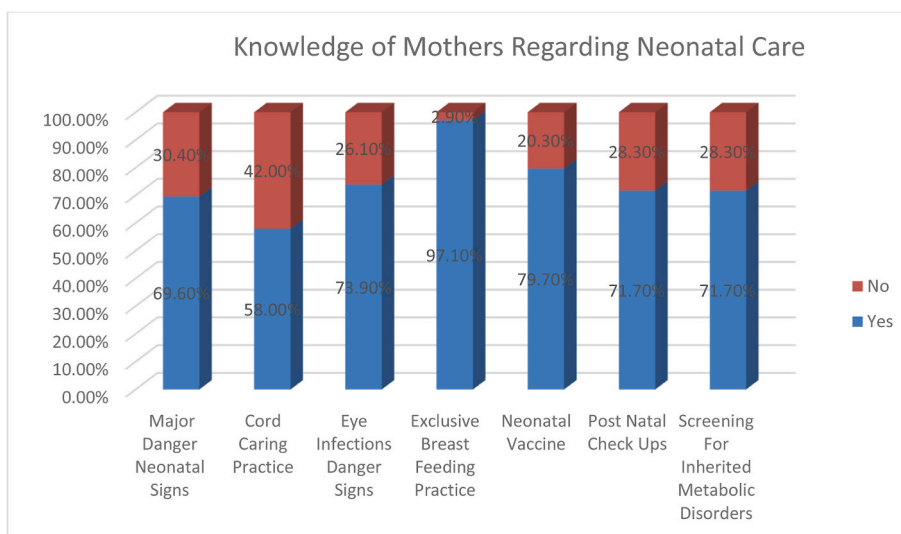|	Factors	Frequency	Percentages	P value
Number of children	One	65	47%	
	Two	35	25%	
	three	21	15%	
	four	13	9.4%	
	five	0	0%	
	Six	4	2.9%	
Age	15–20	19	13.8%	0.000058
	21–25	66	47.8%	
	26–30	30	21.7%	
	Above 30	23	16.7%	
Families	Nuclear	62	44.9%	0.000126
	Joint	76	55.1%	
Marriage Age	Before 18	30	21.7%	0.000304
	18–22	61	44.2%	
	23–27	47	34%	
Mother's Age At First Child	Less than 18	30	21.7%	0.000006
	18–22	35	25.4%	
	23–27	70	50.7%	
	28–32	3	2.2%	

Fig. 1. Knowledge of mothers regarding neonatal care.

Table 2
Knowledge of neonatal care.

Questions	Response	Frequencies	Percentages
1. Knowledge on atleast 5 major danger neonatal signs (neonate unable to feed, unconsciousness, sever chest drawing, convulsion, and fast breathing)	Yes	96	69.6%
	No	42	30.4%
2. Knowledge on cord caring practice (i.e. use of chlorhexidine gel)	Yes	80	58%
	No	58	42%
3. Knowledge on at least 3 neonate eye infection danger signs (eye discharge, reddening of eye and swollen eye)	Yes	102	73.9%
	No	36	26.1%
4. Knowledge on exclusive breast feeding practice	Yes	134	97.1%
	No	4	2.9%
5. Knowledge on neonatal vaccine	Yes	110	79.7%
	No	28	20.3%
6. Knowledge on minimum number of post natal checkups for newborn	Yes	99	71.7%
	No	39	28.3%
7. Knowledge on screening for inherited metabolic disorders (e.g. thalassemia)	Yes	99	71.7%
	No	39	28.3%

with police in Lahore [15]. In the year 2012, Pakistan's chief justice called for the workers to be made permanent government employees with their salaries paid regularly [15].

Despite the justice's order, it's still rare that they receive their pay on time [15]. Thus, there is a need to improve our healthcare system to tackle the problem of high maternal and neonatal mortality. We need to look at the model of health care workers in the world to improve our healthcare system. It is more a matter of policy-making than of funds and resources [9].

Mothers between the ages of 21–25 were shown to be more adept at neonatal care. The transition to becoming a mother is an important event in the lives of adolescent girls [16]. Findings show several challenges faced by pregnant adolescents include depression, anxiety, and stress around the pregnancy [16]. This leads to negative mental health consequences in them girls which includes feeling unsupported and disempowered in providing care for the baby [16].

Several physical problems are experienced by young mothers. The pain associated with labor in the postpartum period becomes a major obstacle to caring for the baby [17]. Most mothers feel tired and helpless, and this prevents them from developing a deeper connection with their newborn [17].
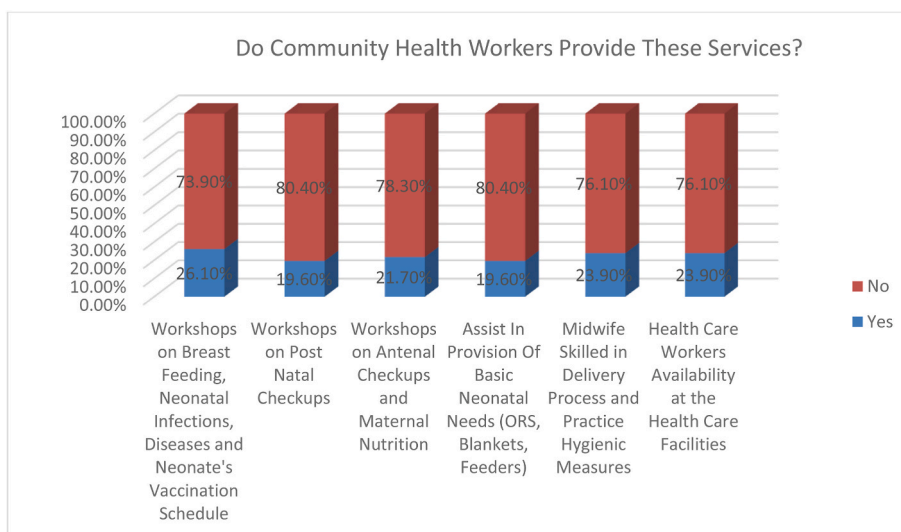

Fig. 2. Do community health workers provide these services?.

Table 3

Working of community health workers.

Questions	Responses	Frequencies	Percentages
1. Do community health workers conduct workshops regarding breast feeding?	Yes	37	26.1%
	No	101	73.9%
2. Do community health workers conduct workshops regarding neonate's vaccination schedule?	Yes	37	26.1%
	No	101	73.9%
3. Do community health workers conduct workshops regarding most common neonatal infections and death causing diseases and how to treat them?	Yes	37	26.1%
	No	101	73.9%
4. Do community health workers conduct workshops regarding post natal checkups?	Yes	27	19.6%
	No	111	80.4%
5. Do community health workers conduct workshops regarding antenatal checkups and hospital delivery?	Yes	30	21.7%
	No	108	78.3%
6. Do community health workers conduct workshops regarding maternal nutrition?	Yes	30	21.7%
	No	108	78.3%
7. Do community health workers assist in provision of basic neonatal needs (provision of ORS, blankets, feeders)?	Yes	27	19.6%
	No	111	80.4%
8. Is the midwife skilled in delivery process and is trained?	Yes	33	23.9%
	No	105	76.1%
9. Does the midwife practice hygienic measures during delivery?	Yes	33	23.9%
	No	105	76.1%
10. Are the health care workers available at the health facility daily?	Yes	33	23.9%
	No	105	76.1%

Additionally, children born to mothers of advanced age had a higher overall morbidity rate compared with children born to mothers aged 25–29 years old, according to a Danish cohort study [18].

Reduction of neonatal and infant mortality rate to an acceptable level is not possible without a good maternal knowledge level regarding neonatal danger signs, the inadequacy of which poses a significant challenge to improving neonatal and child healthcare indicators [19].

First-time parents were found to be not emotionally prepared for the job of parenthood, leading to inadequate neonatal care as compared to multiparous women. First-time parents need to be given proper awareness, counseling, psychological support, and prenatal training; to ensure healthy and safe outcomes for both the neonate and parents [20]. Neonatal nursing has been proved to be an extremely demanding and onerous job for first-time parents, as they do not have any prenatal training for newborn care, which can lead to seriously wrong actions in the postpartum period putting the neonate at a considerable risk [21]. These parents may lack emotional preparation for the arrival of the newborn, which can result in parents being psychologically stressed [20].

Family Centered Care has been shown to decrease the length of stay in hospital for preterm babies, improve rates of successful lactation, reduce infant mortality and infection, and increase weight gain [22]. Furthermore, involvement of extended family in neonatal care has also proven to do wonders. Grandparents' experience, knowledge, and emotional support tend to help the parents in providing optimum care to the newborn [23].

As for the strengths of our study, this research determines the awareness of mothers regarding neonatal care using a standardised questionnaire and precisely points toward the knowledge deficit of the mothers. Effective policies can be devised to address this gap. This research is also directed to assess the role of community health workers in educating the masses about neonatal care and to measure the effect of factors such as education, cousin marriage, and socioeconomic status of the family on neonatal care.

However, since this was a single district study (Rawalpindi) which was performed only in the public sector hospitals of one city; Rawalpindi, much more work is required before the results can be generalized to the population.

8. Relevance and implications

Our study implies that the lady health worker program launched in Pakistan has declined, hence there is a need to reinstate this program to reduce maternal and neonatal mortality along with a need to look into the models of other countries (like Brazil) to improve our health care system. A broader study, targeting all districts of Pakistan, will give a much clearer view of the situation, and then further steps can be taken to handle this problem, mainly by policymaking at the national level to improve the security and social conditions of lady health workers allowing them to work more efficiently for the betterment of this country.

9. Limitations

Since this study was performed only in the governement hospitals of a single city, the results cannot be generalized to the whole population. For that purpose, a much wider study is required. In addition, the strata of population generally visiting these hospitals belong to the lower socioeconomic class, and this can cause a shift in the results of our study aaway from the actual data of the whole population. Therefore, a study including private as well as public sector hospitals of the country could give a much better idea about the actual status quo.

10. Conclusion

Sound health of the mother, good health of the baby, and good health during the first 28 days of life will lead to a good childhood and a productive individual. The world of global health is moving rapidly toward a new framework of health systems in which the real foundation of the health system is what takes place in the community. Community Health Workers can play an important role in Maternal and Neonatal Care. Family-centered care, appropriate age of first conception and motherhood, and proper guidance to first-time parents can ensure adequate neonatal care and help to decrease the burden of neonatal and infant mortality.

Budget

Not significant.

Table 4

Results of multivariate logistic regression.

Hypothesis	Beta Coefficient	R^2	F	P value (significant as less than 0.05)	t value (Significant as greater than 1.96)	Hypothesis Supported
1) The Type of Family Significantly Predicts the Knowledge about Neonatal Care	0.299	0.202	17.057	0.000163	3.88 (greater than 1.96)	Yes
2) The number of children significantly predicts the Knowledge about Neonatal Care	0.321			0.000054	4.169	Yes

Sources of funding

None.

Ethical approval

Ethical Approval Acquired from the University Ethical Review Board. This research is for academic purposes only and does not involve any type of experimentations on humans or animals. Consent of the participants was taken. Participation was voluntary and the mobile number of the first author was shared to withdraw the response if anyone wanted to.

Consent

This research is for academic purposes only and does not involve any type of experimentations on humans or animals. Consent of the participants was taken. Participation was voluntary and the mobile number of the first author was shared to withdraw the response if anyone wanted to.

Authors contribution

1st author Sumia Fatima ~ data analysis, writing the paper, intro, discussion, corresponding author.

2nd author Tayyaba Idrees ~ registration of research, questionnaire, introduction, discussion.

3rd author Maryam Mansoor ~ Intro, methodology, discussion.

4th author Zainab Idrees ~ study design and concept, methodology, analysis.

5th author Dr Sidra Hamid ~ Intro, methodology, discussion.

6th author Zainab Hussain ~ Supervision of research, guidance and analysis.

Registration of research studies

1. Name of the registry: N/A.
2. Unique Identifying number or registration ID: N/A.
3. Hyperlink to your specific registration (must be publicly accessible and will be checked): N/A.

Provenance and peer review

Not commissioned, externally peer-reviewed.

Ethical considerations

Informed consent of the participants was obtained, in section 1 of the questionnaire. The participation was voluntary. Anonymity of the participants was maintained, as there was no clause in the questionnaire that demanded any personal information. The purpose was purely academic and not directed against anyone.

Guarantor

Dr Sidra Hamid Assistant Professor of the Department of Physiology and Department of Education, Rawalpindi Medical University, Pakistan.

Declaration of competing interest

The authors report no conflicts of interest in this work.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.amsu.2022.104750.

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