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Fate Or Fixable? Exploring Teachers Beleifs About Treatable Birth Defects

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ABSTRACT

BACKGROUND: One of the main causes of avoidable newborn morbidity and mortality worldwide is congenital abnormalities. In many communities, awareness is still poor despite the availability of effective preventive strategies like folic acid use and prenatal screening. Although school teachers are vital sources of health information, little is known about their knowledge, attitudes, and practices (KAP) surrounding baby abnormalities. This study assesses and compares the KAP of urban and rural school teachers in Peshawar, Pakistan.

METHODS: For a cross-sectional study, 384 elementary and secondary school teachers from Peshawar's urban and rural districts were selected using multistage random sampling. A standardized questionnaire was used to assess knowledge (7 questions), attitudes (5 items), and behaviors (5 things). Using SPSS version 26, the data was examined using chi-square tests and descriptive statistics; $p < 0.05$ was considered significant.

RESULT: Among the participants, 30.2% had low knowledge and 45.1% had strong knowledge. The knowledge levels of urban teachers were significantly greater than those of rural teachers (55.4% vs. 34.7%, $p < 0.001$). Positive assessments were higher for teachers in rural areas (49.2% vs. 44.6%, $p = 0.030$). Practices were generally insufficient, with only 1.8% attaining adequate practice and 70.1% exhibiting inadequate practice. The practice scores of teachers in rural areas were significantly lower than those in urban areas (74.9% vs. 65.3%, $p = 0.040$).

CONCLUSION : There is a terrible lack of awareness, attitudes, and preventative measures among teachers regarding abnormalities in neonates. Teachers in both urban and rural areas exhibited negative behaviors despite their generally upbeat moods and low competence levels. To assist community-level prevention, it is crucial to improve teacher preparation, incorporate neonatal health awareness into school curricula, and strengthen cooperation with health authorities.

Keywords: *Congenital anomalies, neonatal, defects, teachers, public health, urban, rural*

1. INTRODUCTION

Neonatal defects, also known as congenital anomalies, are a major global public health concern that greatly increases neonatal morbidity and mortality (1). Congenital anomalies affect about 3% of live births in the US, underscoring the significance of early detection, preventive measures, and public awareness (2). Congenital abnormalities are responsible for almost one-third of neonatal deaths in the UK, according to surveillance data, highlighting the importance of prenatal screening and community-level awareness (3). According to the Canadian Congenital Anomalies Surveillance System, early interventions and public education are crucial preventive measures for structural birth defects, which continue to be a major cause of neonatal morbidity in Canada (4).Prenatal exposures, such as air pollution and maternal lifestyle factors, have been linked to an increased risk of congenital anomalies in Japan, according to environmental studies, underscoring the significance of population awareness and education (5). When it comes to spreading health knowledge in communities, school teachers can be crucial (6). Research in related health domains, like autism and epilepsy, has shown that teachers' knowledge, attitudes, and practices (KAP) can affect students' health outcomes, indicating that educating teachers could increase awareness about neonatal defects (7). Evidence from England shows that teachers have a significant impact on children's health behaviors. Congenital anomalies, especially neural tube defects and congenital heart diseases, are highly prevalent in India, according to hospital and community studies, but the general public's awareness of these conditions is still low (8).Despite the fact that

many Chinese women are aware of the benefits of folic acid supplementation, there is still a lack of actual preventive practice, which indicates a disconnect between behavior and knowledge (9). According to research, 2–7% of live births in Pakistan have congenital abnormalities, with neural tube defects, hydrocephalus, and cleft lip/palate being the most prevalent (10). Low awareness and inadequate preventive measures regarding congenital anomalies are revealed by community-based KAP surveys among pregnant women (11).

Despite this, little research has been done on school teachers' knowledge, attitudes, and practices regarding neonatal defects, especially when comparing urban and rural populations. Knowing teachers' KAP could help with focused educational interventions, enhance early detection, and encourage community-level preventive practices.

This study aims to assess the knowledge, attitudes, and practices of urban and rural school teachers regarding neonatal defects. The findings will help identify gaps and inform strategies for school-based awareness and educational interventions to improve early detection and prevention in the community

2. STUDY DESIGN

A cross sectional study was carried out among school teachers in rural and urban regions of Peshawar. The duration of study was 3 months. The primary objective of the study was to assess the knowledge, attitudes and practices (KAP) of school teachers regarding neonatal defects and to compare these domains between urban and rural populations. Full-time primary and secondary school teachers from both the public and private sectors were involved in the study. Teachers who consented to participate and have been employed at their current school for at least six months were eligible. Teachers who worked as administrative staff or those who were on leave throughout the study period or those who refused to provide consent were excluded.

3. STANDARD PROCEDURES OF THE STUDY

Consent was obtained from the NORTHWEST SCHOOL OF MEDICINE Institutional Review Board (IRB) before data collection began. Permissions were obtained from the school administration. The data was collected by the student researchers who had received ethical data and were familiarized with objectives of research. During school hours, each participant was contacted and given an oral briefing about the purpose, nature and voluntary features of the study. Prior to the questionnaire being administered, written consent was obtained.

A self-structured questionnaire that was adapted from previous validated KAP research served as the data gathering tool

4. DATA COLLECTION

A Multistage random technique was used. A Sample size was calculated using OPENEPI software. The following parameters were used

Population size= 1000000 as population size was considered large so this value was used as per OPENEPI guidance

Anticipated frequency (p) = 50% since true frequency was unknown

Confidence limits as + - percent of 100 = 5%

Design effect = 1%

So based on these parameters the calculated sample size for 95% confidence level was 384

5. SCORING AND CATOGRIZATION

Each section of the knowledge, attitudes and practices were scored as follows:

KNOWLEDGE: True response was scored as 1, false or don't know responses as 0. Total score ranged from 0 to 7 and was categorized as;

Poor: 0 to 3

Fair: 4 to 5

Good: 6 to 7

ATTITUDE: Responses were rated using the 3 point Likert scale (Disagree = 1,Neutral = 2,Agree = 3). The total score ranged from 5 to 15 and was categorized as;

Negative: 5 to 8

Neutral: 9 to 11

Positive: 12–15

PRACTICES: Responses were scored as Yes = 1, No = 0. Total score ranged from 0 to 5 and was categorized as;

Poor: 0–2

Fair: 3–4

Good: 5

6. DATA ANALYSIS

Collected data was entered into Microsoft excel (MS EXCEL) and was analyzed using IBM SPSS version 26. Descriptive statistics including frequencies and percentages were calculated for all categorical variables. Means and standard deviations were reported for continuous variables such as age and teaching experience.to examine the relationship of school location (rural vs. urban) and the level of knowledge attitudes and practices, the Chi square test was applied. A p value 0.05 was considered statistically significant. Data was presented in tables and graph to support interpretation and highlights differences among groups.

7. ETHICS

The project was deemed exempt from review by the NORTHWEST SCHOOL OF MEDICINE. Since study involves minimal risk and no clinical intervention so it is ethically appropriate for undergraduate level students.

8. RESULT

A total of 384 school teachers participated in this study, with a mean teaching experience of 15.21 years (SD ± 10.37). 57.4% (n=210) of the respondents were females, while 45.3% (174) were male. The urban-to-rural ratio was deliberately kept constant to ensure equal representation for comparative analysis. Academically, 19.8% (n=76) had a bachelor's degree, 63.8% (n=245) had a master's degree, and 16.4% (n=63) held a doctorate or PHD degree. Table 1. Illustrates the demographic details of the teachers.

Table 1. Demographics of the Respondents (n=384)

Variable	Category	n	%
Gender	Male	174	45.3
	Female	210	54.7
School Type	Public	319	83.1
	Private	65	16.9
School location	Urban	193	50.3
	Rural	191	49.7
Education	Bachelor's	76	19.8
	Master's	245	63.8
	MPhil/PhD	63	16.4
Formal Health Training	Yes	103	26.8
	No	281	73.2

Teachers' knowledge, attitudes, and procedures regarding newborn anomalies are displayed in Table 2. Approximately one-third of the teachers had inadequate knowledge (30.2%), despite the fact that over half of them showed strong knowledge (45.1%). Only 7.6% of the comments were unfavorable; the remaining responses were either positive (46.9%) or neutral (45.6%). However, a relatively low level of practice was indicated by the fact that only 1.8% of teachers reported using the proper methods for infant abnormalities. Inadequate procedures were reported by the majority of teachers (70.1%).

Table 2. Knowledge, Attitude, and Practice Levels of Teachers about NEONATAL DEFECTS

Domain	Category	n	%
Knowledge	Poor	115	30.2
	Fair	94	24.7
	Good	172	45.1
Attitude	Negative	29	7.6
	Neutral	175	45.6
	Positive	180	46.9
Practice	Poor	269	70.1
	Fair	108	28.1
	Good	7	1.8

Compared to 34.7% of teachers in rural areas, 55.4% of teachers in urban areas had an exceptional comprehension of neonatal surgery ($p < 0.001$). Positive attitudes were more common among rural instructors (49.2%), whereas neutral opinions were more common among urban professors ($p = 0.030$). Although practice levels were low in both situations, they were worse in rural areas (74.9% poor vs. 65.3% urban), and very few teachers demonstrated great practice ($p = 0.040$). Urban instructors typically had more knowledge, despite the fact that all groups' actual practices were insufficient.

Table 3. Comparative Analysis of KAP Levels Among Urban and Rural Teachers

Domain	Location	Poor (%)	Fair (%)	Good (%)	p-value
Knowledge	Urban	18.3	26.2	55.4	<0.001
	Rural	42.1	23.2	34.7	
Attitude	Urban	4.7	50.8	44.6	0.030
	Rural	10.5	40.3	49.2	
Practice	Urban	65.3	31.6	3.1	0.040
	Rural	74.9	24.6	0.5	

9. DISCUSSION

The results of the study show that school teachers' knowledge of birth defects varies significantly between rural and urban locations. Only 34.7% of rural teachers and 55.4% of urban teachers in our study had "good" knowledge scores ($p<0.001$). These results are consistent with global trends in health literacy, which indicate that city people often have easier access to information and resources. For instance, in China, a greater awareness of folic acid's role in preventing neural-tube abnormalities was associated with higher levels of education and wealth—qualities more prevalent in metropolitan regions (12). Official statistics show that 3% of children born in the United States have congenital defects (13). Two to three percent of live babies in India are estimated to have congenital defects (14). Teachers in distant areas might be less informed due to a lack of training opportunities and exposure to public health messaging. These difficulties serve as a reminder of how crucial raising awareness is. While gaps may disseminate false information in the community, experienced teachers are more likely to counsel at-risk families and include preventative messages in their courses, which makes this gap crucial.

It should be noted that both groups had generally positive attitudes toward birth abnormalities, although rural instructors performed better (49.2% vs. 44.6% in urban, $p=0.03$). Positive feedback suggests that teachers understand the gravity of the situation and want to participate in instructional initiatives. Positive attitudes and willingness, according to the health promotion theory, may drive people to take preventative actions. According to WHO's Health-Promoting Schools

framework, teachers collaborate to develop school policies and practices that "foster health and learning." (15). The fact that rural teachers reported some positive sentiments could be attributed to their firsthand experience in poor areas, suggesting that when given the correct information, they can be effective advocates. However, the preponderance of neutral attitudes among urban teachers indicates complacency or a lack of importance, undermining preventive initiatives. In any case, attitudes do not guarantee action, but they are a reliable predictor. School health specialists feel that experienced and motivated teachers are critical components of effective health education (16).

Despite their hopeful beliefs, both groups engaged in only moderate levels of preventive activities. More over 65% of instructors in each region reported "poor" practice, with only 3.1% of urban teachers and 0.5% of rural teachers rating it as "good" (p=0.040). The knowledge-practice gap is a recurring problem in public health. For example, 95% of Chinese women had heard of folic acid, and 88% knew it helps prevent neural tube defects, yet only 32% reported taking it correctly (12). This means that awareness does not necessarily lead to action. Similarly, our study's instructors may understand the significance of newborn health but lack the requisite abilities or resources to execute preventive measures in their disciplines (such as screening, parental counseling, or curriculum implementation). In rural areas, even lower practice rates (just 0.5% "good") may suggest additional challenges such as limited access to healthcare, less school resources, and increasing workloads. These findings are consistent with larger health disparities; for example, research has shown that rural areas have a greater incidence of anemia and lower adoption of preventative measures, which can be attributed to a lack of health workers and outreach programs (17). The extremely low levels of practice in both situations indicate a clear need for support. Teacher training is an essential strategy. Health promotion experts advise teachers to be empowered through professional development. Quality school health programs "use qualified and supported teachers" to provide curricula (18). School-based training programs have proven beneficial in a variety of circumstances. For example, in Ghana, professors delivered peer education on malaria prevention, and students disseminated the information across the community, raising awareness of malaria transmission. (19). Similarly, in Hong Kong, a structured school health curriculum that incorporated systematic planning and teacher development produced considerable results: a meta-analysis discovered that integrated programs increased children's social-emotional abilities by 25% and academic test scores by 11% (20). These programs stress active student engagement and improved teaching skills, which are consistent with the needs highlighted in our research. Explicit health training would help rural and urban teachers transition from knowledge to practice by enabling them to offer counseling (including preconception care), identify at-risk families, and collaborate with school health services.

There are examples of school-based interventions in low-resource settings. For example, foreign-funded health-promotion projects in Cambodia, Ethiopia, and Haiti have enhanced school attendance and learning while communicating health messages (such as handwashing and nutrition) through teacher-led initiatives (21). at Pakistan, educational activities at madrassas and schools have been used to promote mother and child health. Although few previous studies have focused on teachers and congenital anomalies, the evidence is clear: multiple approaches that include training, curriculum materials, community participation, and government assistance produce the best results. A detailed study of school health initiatives found that exact preparation, leadership commitment, and ongoing teacher engagement are critical to success (20). Finally, having teachers serve as frontline public health advocates (with the necessary training and support) might benefit the entire community.

10. CONCLUSION

In this cross-sectional study of 384 primary and secondary school teachers in Peshawar, there was a substantial difference in the awareness of prenatal anomalies between urban and rural instructors. Compared to rural teachers, urban teachers had a considerably greater percentage of acceptable knowledge (55.4% vs. 34.7%, $p < 0.001$). All groups had generally good perceptions about newborn anomalies; however, among rural instructors, the percentage of positive sentiments was significantly higher (49.2% vs. 44.6%, $p = 0.030$). Despite these positive attitudes and sufficient knowledge levels, just 1.8% of instructors had a "good" practice score (urban 3.1% vs. rural 0.5%, $p = 0.040$), while 70.1% of teachers were deemed to have inadequate practice.

These results demonstrate that there is a substantial knowledge-practice gap and that positive attitudes alone are insufficient to promote preventative action. Reducing these discrepancies requires targeted intervention, particularly in rural schools. These include better ties between schools and local health organizations for community outreach and referrals, teacher in-service training, and curricular integration of congenital defect prevention. As part of broader initiatives for mother and child health, governments and education authorities should place a high premium on developing teacher capacity. Future research should evaluate the effectiveness of school-based training programs and look into the barriers that impede teachers from transforming their knowledge and attitudes into practical preventative measures. Implementing these measures could empower teachers to become effective agents of community awareness and contribute to reduction in the burden of neonatal defects.

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