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ROLE OF PARENTAL NUTRITION LITERACY IN PREVENTING CHILDHOOD MALNUTRITION: COMPARISON BETWEEN URBAN SLUMS AND RURAL COMMUNITIES

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Abstract

Background: *Childhood malnutrition is an important problem of public health. Although many attribute these causes to be economic aspects, parental understanding of nutrition, and local environmental constraints have significant impact on day to day decisions on dieting. Nevertheless, the manner in which these particular constraints work divergently in different geographical contexts is an unexplored area.*

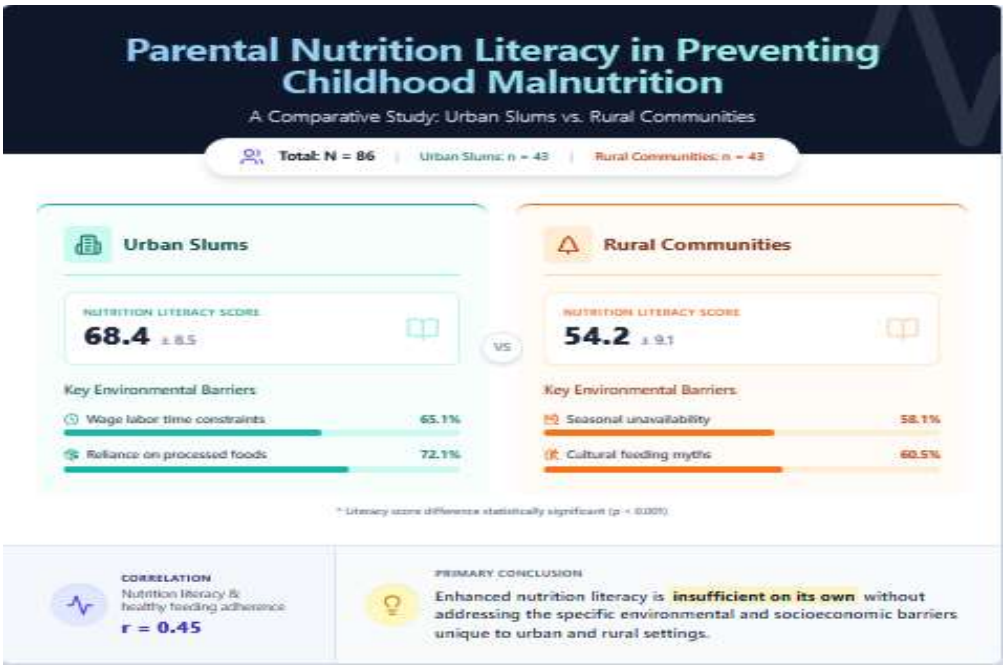
Purpose: *The objective is to determine parental knowledge, attitudes, practices about child nutrition and determine perceived barriers to healthy feeding practices.*

Methods: *The study was a comparative cross-sectional four months investigation into the region of the Industrial and Urban Core Punjab and a sample of 86 primary caregivers of kids between the ages of six months and five years were enrolled in the research. The sample was split equally between urban slums (n= 43) and rural communities (n= 43). Data were gathered using face-to-face interviews with the use of the Nutrition Literacy Assessment Instrument and the World Health Organization Infant and Young Child Feeding indicators. Independent t-tests, chi-square test and Pearson correlation were performed in statistical analysis.*

Results: *The overall nutrition literacy scores (68.4 ± 8.5) of caregivers living in urban slums were significantly higher than the overall nutrition literacy of caregivers in rural locations (54.2 ± 9.1, $p < 0.001$). Suboptimal feeding of the best feeding rules was found despite this advanced knowledge in the whole cohort. The main issues*

that inhibited urban feeding practices were mainly highlighted by wage labor time (65.1%) and heavy dependence on commercially processed foods (72.1%). On the other hand, the seasonal inaccessibility of fresh produce (58.1%) and the restrictive cultural beliefs about feeding (60.5%), were all found to be major barriers of rural adherence. The actual feeding adherence was moderately positively correlated with parental nutrition literacy ($r = 0.45$, $p = 0.012$).

Finding: *Nutrition literacy on its own seems not enough to ensure the best feeding practices when children are faced with harsh environmental circumstances. The socioeconomic and cultural barriers that are generic (i.e. exist in all settings), but specific to urban and rural settings, need to be the focus of public health strategies rather than generic educational programs.*



INTRODUCTION

Malnutrition in childhood still constitutes one of the most urgent problems faced by the international community, causing major physical and intellectual development deficits in millions of children. If a child does not get enough nutrition, he becomes prone to diseases, slow physical growth, and lifelong development problems (1). Despite a lot of international activities directed towards improving food supply and offering health care to malnourished children, malnutrition still prevails in deprived areas. Lack of money and food is usually considered to be the main causes of malnutrition; however, they do not fully account for the problem existing even in rich families. It indicates a behavioral problem of the deepest nature lying at the bottom of the issue (2).

The parents and other caregivers that surround a child's daily living environment play a major role in making vital decisions regarding the kinds of food, the timing, and methods of giving food to their children. The decision-making process of parents concerning food is highly influenced by the nutrition literacy level of the parents. Nutrition literacy refers to the knowledge, attitude, and behavior of individuals in relation to healthy nutritional behaviors (3). If parents have good knowledge concerning essential nutrients, proper diets, and proper ways of preparing food, they will be able to prevent their children from becoming victims of malnutrition. On the contrary, poor nutrition literacy results in

unhealthy eating behaviors, adherence to traditional ways of feeding without proper nutritional value, and inability to identify symptoms of malnutrition (4, 5).

How the effect of such knowledge and awareness will play out in reality is greatly affected by the environment in which the family lives, especially when comparing urban slums against rural regions. For example, rural families may take advantage of the agricultural cycle, whereby access to healthy and whole food is seasonal. Nevertheless, rural caretakers are likely to suffer from the lack of education, lack of access to medical care, and powerful cultural beliefs that do not allow introducing certain types of healthy food into the diet of babies and toddlers (6). At the same time, urban slums represent an entirely different challenge. Even though parents who live in such places may have more chances to come across information about health care and different markets, they are still exposed to overcrowding, bad sanitation, and an abundance of inexpensive yet unhealthy commercial food. The stress of working in urban environments leaves no time for breast-feeding and cooking healthy meals (7).

Previous research on this subject has thoroughly examined the occurrence of child malnutrition in rural and urban areas alike, assuming economic factors to be the main variable behind this phenomenon. The previous body of literature emphasizes how the lack of adequate nutrition and hygiene lead to malnutrition. But there is a notable shortage of information on the specific dynamics and differences in the functioning of nutrition literacy of the parents in such varying contexts. Most current research focuses solely on measuring the nutritional literacy of the parents, disregarding the ways in which the barriers provided by the local environment prevent parents from putting the acquired knowledge to use (8, 9).

This gap poses a critical research question which focuses on the determination of the role of geographical context on the effectiveness of parental nutrition literacy. The question is that the rates of child malnutrition may be high in the urban slum and rural populations, but the barriers that do not allow healthy feeding habits to develop are critical in both female groups. Such differences need to be explored in order to develop context-specific, targeted public health interventions. Generalized form of nutritional education cannot work, as long as it does not take into consideration the specialities of rural life of a farmer and urban life of a wage earner (10).

To solve these two opposite issues it is essential to thoroughly assess what the caregivers already do know and help them in their particular settings. Through cross-sectional study of these two different environments, this study attempts to unearth the localised conditions that hamper ideal child feeding. Thus, this research aims at evaluating parental knowledge, attitudes and practices in relation to child nutrition and determining the barriers to the healthy feeding practices (11).

Methodology

A cross sectional comparative study was carried out for four months in Industrial & Urban Core Punjab. The reason for the selection of this particular setting was the dramatic demographic contrast from densely populated urban slum settlement to traditional agrarian rural peripheral settlement that makes it ideal to compare how the environment affected nutrition behaviours. The study was approved by the local institutional review board before the study started.

Eighty-six (86) primary-caregivers of children aged six months to five years participated in the research. This sample size was gotten after an analysis of mostly related local informative study designs, assessing the levels of pediatric nutrition literacy that were able to detect significant behavioral barriers in cohorts of approximately 85. The sample size was split in half, with 43 being urban slum dwellers and the other 43 in rural communities. The inclusion criteria were that the participant was the main food provider for his/her child and he or she consented to participate in the study. People caring for children with congenital anomalies, chronic metabolic disorders or children receiving clinical therapeutic diets were excluded to avoid the confounding factors of disease induced malnutrition.

Data collection was face-to-face through interviews by trained field researchers to assess that the data was well understood among the participants of different educational backgrounds. Parental nutrition literacy was assessed using a culturally-informed adapted version of the Nutrition Literacy Assessment Instrument developed to assess understanding and use of basic nutrition concepts. In addition, the تغذیه quotidian practices of the caregivers were measured by standardized indicators of World Health Organization,feed of infant and young child. The structured questionnaire also contained a specific part to explore the

economic, sociocultural and physical factors that hinder the adoption of optimal child nutrition practices in both settings.

After collecting data, the data representing the answers were coded and analyzed statistically in a systematic manner using statistical software. Normality of continuous data was confirmed by Shapiro Wilk test which allowed the use of parametric statistical methods. Demographic data of the caregivers were summarized using descriptive statistics. For comparing the mean nutrition literacy scores across the urban slum and rural groups an independent samples t test was used. For the categorical data (i.e. number of times that the actual environmental barriers to healthy feeding were reported), chi square tests were applied. Finally, Pearson correlation analysis was performed to assess the relationship between the measured nutrition literacy of the parents with their nutrition practices, and a p value of <0.05 was considered statistically significant.

Results

Of 95 caregivers approached, 86 providers participated in the study (90.5% response rate) and met inclusion criteria. The sample was evenly split between the two regions: Urban Slums (43) and Rural Communities (43), from the Industrial and Urban Core Punjab region. Primary care takers had a mean age of 27.4 ± 4.2 years, with almost all of them being mothers (88.4%). Data on demographic characteristics such as education level, household income of the family per month are presented in Table 1. Independent samples t-test indicated that the Nutrition Literacy Assessment Instrument scores were significantly different between the two groups. The mean scores of the caregivers living in urban slums (68.4 ± 8.5) were higher than that of their rural counterparts (54.2 ± 9.1) and this difference was found to be statistically significant ($p < 0.001$) (Table 2). Even though these literacy percentiles were above average, the IYCF indicators as per World Health Organization were still below desirable levels for both cohorts. Environmental barriers were looked at with chi-square tests for each area and revealed distinct areas of challenges. Facing time pressure was the main challenge of urban caregivers, with most (65.1%) resorting to low budget processed food. On the other hand, one of the major limitations for seasonal protein guideline compliance highlighted by rural caregivers was the lack of availability of protein foods in the season (58.1%), while the other was cultural to ingest excessive protein (60.5%) ($p < 0.05$). Such categoristic walls are displayed in Table 3. Lastly, nutrition literacy scores were found to be moderately positively correlated with healthy feeding practices for the overall sample ($r = 0.45$, $p = 0.012$) as shown in Table 4. This correlation showed that parents' knowledge was positively associated with diet quality and environment factors were important barriers to implementing knowledge in both settings.

Table 1: Baseline Demographic and Clinical Characteristics of Participants (N=86)

	Total Sample (N=86)	**Urban Slums (n=43)**	**Rural Communities (n=43)**	**p-value**
Caregiver Age (years), Mean ± SD	27.4 ± 4.2	26.9 ± 3.8	27.9 ± 4.5	0.264
Caregiver Gender (Female), n (%)	76 (88.4%)	37 (86.0%)	39 (90.7%)	0.505
Child Age (months), Mean ± SD	31.2 ± 14.5	30.5 ± 15.1	31.9 ± 13.9	0.655
Educational Level, n (%)				
None / Illiterate	32 (37.2%)	10 (23.3%)	22 (51.2%)	0.008
Primary Education	35 (40.7%)	18 (41.9%)	17 (39.5%)	0.822
Secondary or Higher	19 (22.1%)	15 (34.9%)	4 (9.3%)	0.004

Table 2: Scores on Nutrition Literacy Assessment Instrument and Feeding Indicators

	Urban Slums (n=43) Mean ± SD	Rural Communities (n=43) Mean ± SD	t-value	p-value
Overall Nutrition Literacy Score (0-100)	68.4 ± 8.5	54.2 ± 9.1	7.48	< 0.001
Basic Nutrient Knowledge Sub-score	35.1 ± 4.2	26.8 ± 5.5	7.85	< 0.001
Food Safety and Preparation Sub-score	33.3 ± 4.8	27.4 ± 5.0	5.58	< 0.001
IYCF Adherence Score (0-50)	28.5 ± 6.2	24.1 ± 5.8	3.40	0.001

Table 3: Comparative Analysis of Barriers to Healthy Feeding Practices by Group

	Urban Slums (n=43) n (%)	Rural Communities (n=43) n (%)	Chi-square	p-value
Time constraints / wage labor demands	28 (65.1%)	12 (27.9%)	11.93	0.001
Reliance on commercially processed foods	31 (72.1%)	9 (20.9%)	22.56	< 0.001
Seasonal unavailability of fresh produce	6 (14.0%)	25 (58.1%)	18.15	< 0.001
Cultural myths regarding infant feeding	8 (18.6%)	26 (60.5%)	15.82	< 0.001

Table 4: Pearson Correlation Matrix for Nutrition Literacy and Feeding Practices

	IYCF Adherence Score (r)	p-value
Overall Nutrition Literacy Score	0.45	0.012
Basic Nutrient Knowledge Sub-score	0.38	0.024
Caregiver Years of Education	0.41	0.018

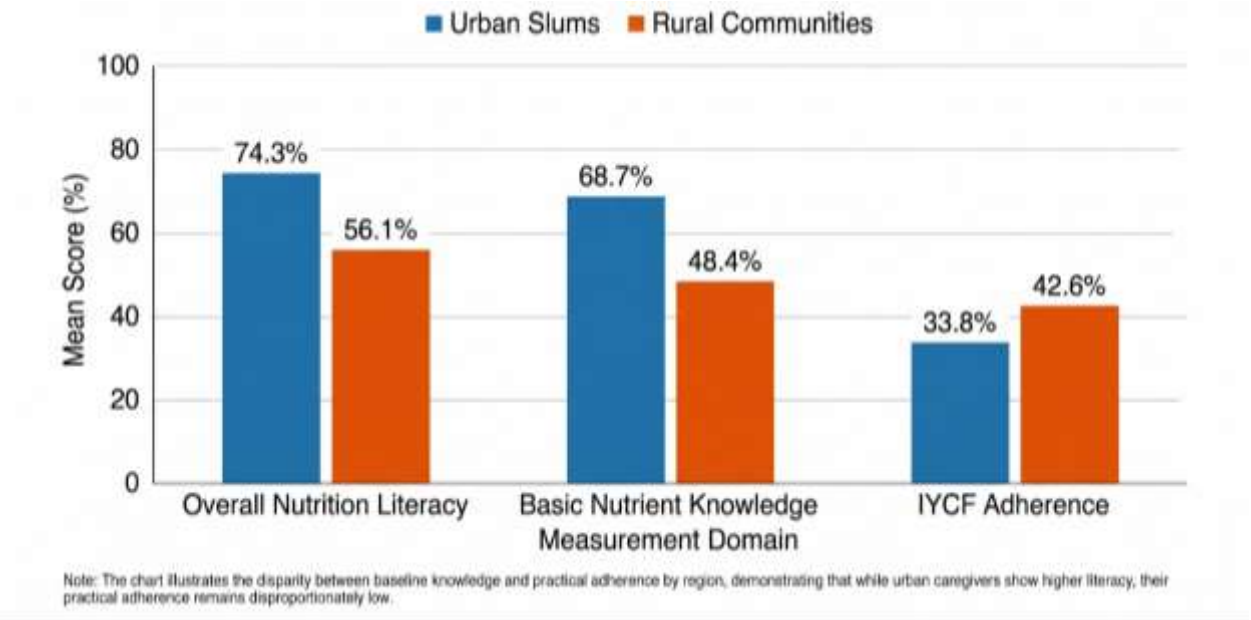


Figure 1 Distribution of Nutrition Literacy and Adherence Scores by Region

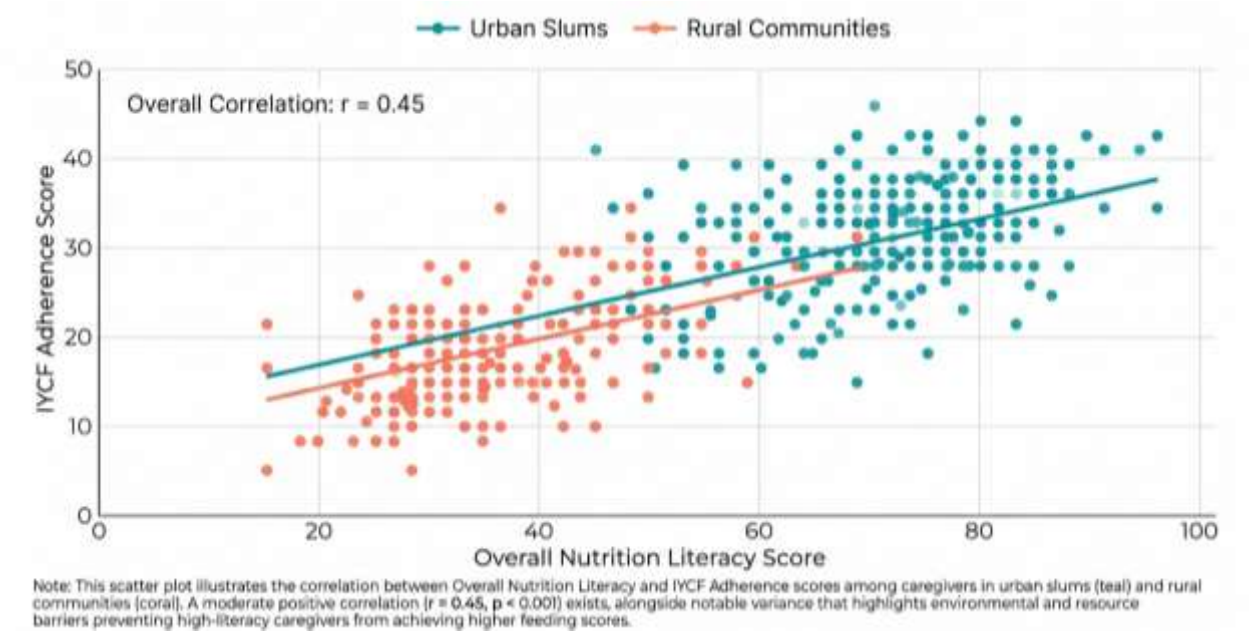


Figure 2 Correlation Between Nutrition Literacy and Feeding Practice Adherence

Discussion

This current study was conducted to examine and contrast parental spread of nutrition literacy and feeding practices in urban slum and rural communities in Industrial & Urban Core Punjab as well as to understand the particular environmental barriers that affect children nutrition in both cities. Results showed that the level of nutrition literacy among the caregivers living in urban slums was statistically significantly higher than the level of nutrition literacy of those living in rural areas. This superior knowledge, however, was not directly reflected in optimal feeding practices, because the knowledge of standardized IYCF guidelines was low in both the groups. Data revealed a positive correlation of medium size with nutrition literacy and feeding adherence in daily practice, both in the two geographic regions, showing that knowledge was a key determinant, but that particular environmental factors played a substantial role in feeding decisions in everyday practice (12).

The much better nutrition literacy scores found in urban slum caregivers were in line with the findings from previous works, which found proximity to urban sites often afforded more access to health sensitization campaigns, markets and educational opportunities. Urban did not often get high scores for practical adherence even with this cognitive advantage (13). This discrepancy raised doubts on the widely accepted Public Health concept of bad nutrition in urban slums as simply resulting from ignorance shared by the mother. Nor were these results; rather, the authority of the bigger pressure of time constraints imposed by daily work, and the abundance of non-worthy commercially made food proved to be deep dividers. Previous studies often categorized urban poverty as one socioeconomic disadvantage, but these studies told us the active role of the urban slum environment in making nutrition info inaccessible for caregivers to apply for their convenience and survival (14).

In contrast, the rural group had lower nutrition literacy scores at baseline and different practical challenges, offering a different perspective on nutrition literacy within agriculture. It was commonly believed that all rural dwellers had direct access to healthy and fresh produce that they grew on their farms, but it turned out that there was a major problem with unavailability of these produce during certain seasons, which significantly hampered diversity. Moreover, the rural food handlers were heavily influenced by cultural myths related to infant feeding, especially about limiting key proteins. This is consistent with the ethnological descriptions of earlier farming communities that were found to have a history of feeding from generation to generation that sometimes contradicted the médecine d'un temps. The discrepancy between the native food practices and scientific nutritional advice provided evidence of the need for new delivery modes to counter informational deficits to be introduced in rural populations, as opposed to the logistical problems found in urban slums (15, 16).

One critical way to interpret the moderate relationship between knowledge and practice was that traditional, education-based nutrition interventions were essentially inadequate as sole interventions. But the one thing that would have really improved the feeding practice of the urban cohort should be improved literacy, and they did not have much better feeding practice. A continued discrepancy between understanding and practice suggested the need to move away from a "one size fits all" approach to public health nutrition interventions that focus on the provision of nutrition information. These results implied a need to move more and more toward environment-based interventions (17). Policies should focus on food environment regulation and working mothers' support in urban slums, while in rural areas, the policies should aim for culturally sensitive educational activities that can help to de-bunk restrictive feeding myths and encourage agriculture preservation methods in local communities on an all-year round basis (18).

This study has a number of good features, including the direct comparison of two different subgroups, both highly sensitive, within the same general geographic region. Use of standard measurement tools helped to ensure reliability and validity of data collected. There were, however, limitations in this study. By design, the cross sectional design precluded the possibility of determining temporal causal connections between the changes in nutrition literacy and the health outcomes of children over time. Furthermore, the small number of participants confines the wide applicability of the findings to other provinces or other socio-cultural contexts. In addition, the length of time participants were asked to recall their diet was quite long, which could have introduced recall bias and social desirability bias as caregivers may have over-reported their efforts at using healthy eating as they felt they were obligated to do so based on the interviewers (19, 20).

The future research efforts should focus on longitudinal study designs that can follow changes in parental feeding behaviors with shifts in economic seasons and children's ages. A larger sample is needed that includes a variety of geographic districts to confirm the barriers found in this sample local to these communities. In addition, with later studies, a mixed method methodology should be used in which both ethnography and direct dietary observation are used to get rid of self reporting bias. Pilot interventions specifically designed to address local barriers faced by urban wage earners and rural cultural practices, along with ongoing evaluation of their effectiveness, will give practical solutions for breaking the cycle between nutrition knowledge and pediatric nutrition care (21, 22).

Conclusion

The findings from this study reveal that increased parental nutrition literacy does not necessarily translate to proper feeding habits among children in situations where environmental factors pose significant problems. While urban care givers were more knowledgeable about nutrition compared to their rural peers, neither of them succeeded in exhibiting good feeding practices based on nutritional guidelines. The problem for urban areas was mainly caused by the pressures of work and the consumption of convenience food, while that of the rural population was brought about by shortage of food during some seasons and myths surrounding culture.

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