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RESEARCH ARTICLE

Prevalence and Socio-economic Factors of Diarrhea and Acute Respiratory Infections among Children under 5 years in Pakistan

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Abstract

Background

Acute respiratory infections (ARIs) are a leading cause of morbidity and mortality among children under five years old in Pakistan, reflecting broader socioeconomic and healthcare disparities. This study investigates the prevalence of ARIs and the regional inequalities contributing to their high incidence, utilizing data from the 2017-18 Pakistan Demographic and Health Survey (PDHS).

Methods

A cross-sectional design was employed, analyzing socio demographic, environmental, and child-related factors among 11,645 children under five. Descriptive statistics and logistic regression were used to identify key determinants of ARIs. Variables included maternal education, household wealth, water sources, and regional distribution.

Results

The prevalence of ARIs was 7.6%, with significant regional disparities. Children in Sindh, KPK, and AJK had higher odds of ARIs compared to Punjab. Maternal education, particularly higher education, was associated with reduced ARI prevalence, though not statistically significant. Access to clean water sources, such as public taps, significantly lowered ARI risk. Wealth index categories showed no clear trend, while child-related factors, such as age and birth order, influenced ARI prevalence.

Conclusions

The study highlights the importance of addressing regional disparities, improving maternal education, and ensuring access to clean water to reduce ARI prevalence. Targeted interventions in high-risk regions, coupled with public health strategies promoting hygiene, vaccination, and healthcare access, are essential to mitigate ARIs and improve child health outcomes in Pakistan.

Keywords

Acute respiratory infections, child health, regional disparities, maternal education, clean water access, public health interventions.

Abstracts in عربی، اردو, 中国人, française, русский and español at the end of the article

Layman Summary

This study looked at why so many young children in Pakistan get sick with breathing problems like coughs and pneumonia, known as acute respiratory infections (ARIs). Using data from a national survey, researchers found that 7.6% of children under five had ARIs. Kids in regions like Sindh, KPK, and AJK were more likely to get sick compared to those in Punjab. Mothers with higher education tended to have healthier children, and having access to clean water also helped reduce sickness. However, being wealthier didn't always protect kids from ARIs. The study suggests that improving healthcare access, educating mothers, and providing clean water can help reduce these infections. By focusing on high-risk areas and promoting better hygiene and vaccinations, Pakistan can improve the health of its youngest children.

INTRODUCTION

A country's well-being can also be assessed by measuring the well-being of the country's children to have a glimpse of the socioeconomic status of the people and the performance of the healthcare sector of the country. In Pakistan, the number of acute respiratory infections (ARIs) among the group of less-than-five-year-olds is a serious public health problem. Despite being extremely avoidable, the number of ARIs is still a significant driver of morbidity and mortality among the children. These are among the key causes of illness and mortality among infants and younger children globally, including Pakistan.

Health determinants are the determinants of a state of well-being that are not medical that include the conditions into which individuals are born, develop, work, and age [1]. Acute respiratory infection causes approximately two million deaths and 70% of hospitalizations among children less than the age of five globally [2]. In the whole of the world, ARIs are a significant cause of illness and mortality among this group [3]. An estimated 120 million pneumonia episodes occur among children less than the age of five per year with a total of 14 million of them progressing to severe illness [4]. It is revealed by studies that 13 million of them result in death [4]. A study of 40 developing countries estimated the overall incidence of the ARIs at 13%, with the socioeconomic conditions both affecting the disease itself and the treatment of the disease. It is implied that the signs of the ARI are significant causes of morbidity and mortality among the children, particularly among the low-income nations [5]. An auxiliary study of China estimated the overall incidence of the URIs among 204 countries and established that the highest incidence rates of incidence were among the group of the under-five [6]. In Iran, economic inequity was revealed to have contributed to 36% of the inequities of the infant mortality that were associated with the income [7].

Research from Bangladesh revealed that the major predictors of ARIs among two-year-old children residing in rural areas were maternal depression and food insecurity [8]. Reports of studies conducted in Nigeria indicate that both individual and community determinants impact the outcome of healthcare [9]. In a case-control study of a periurban district of Pakistan, the authors observed that both the upper and lower respiratory infections are included within the category of ARIs with common conditions like influenza and the common cold being the most frequently experienced diseases. The authors of the study established that exclusive breastfeeding status of the infants, being female gender, and the presence of comorbid conditions like diarrhea were the major determinants of ARIs. Furthermore, the major causes of 15% of all the deaths among the children are due to ARIs [10]. In Pakistan, the incidence of the diseases of the respiratory system increased significantly within the last two decades [11].

Pakistan is ranked seventh among 22 countries with the highest tuberculosis burden worldwide [12]. It has been found that there is a significant association between social factors at the individual and community levels and a child's greater chance of developing ARI symptoms [13]. In a study conducted in 35 slums in Karachi, Pakistan, it was seen that majority of the people affected by ARIs were of low socioeconomic class. As a result of rapid population growth linked to rural-to-urban migration, industrialization, and the ongoing economic crisis, many people are compelled to reside in slums. Individuals living in slums face significant vulnerabilities, including low socioeconomic status, high illiteracy rates, poverty, large family sizes, limited access to health facilities, and poor living conditions [14]. A comparable analytical approach has been applied in previous studies that identified the origins of wealth disparities such as on infant mortality [15], children's malnutrition [16] and poor mental health [17]. It was estimated that in 2013, the primary reasons for mortality were lower respiratory tract infections observed predominantly in younger children [18]. According to another study conducted in various regions of Pakistan, a lack of disease control methods and lack of education are contributing factors to the high death rate. It was also mentioned that infections of the respiratory system cause 20% to 30% of all infant deaths, especially in Pakistan [19]. It was seen that the most common symptom was cough aggravated by dust and worsening during the winter season. Previous literature suggested that pneumonia was the most common complication and majority of the mothers opted for outside medical help. However, those who did chose to self-medicate, used paracetamol most frequently [20]. In a cross-sectional study conducted in District Bannu of Khyber Pakhtunkhwa, it was seen that lower respiratory infections in peaked in February and had a low incidence in May. Different age groups showed different peaks [21]. The rise in socio-economic inequality could have influenced how household and regional factors affect child health outcomes. These socio-economic disparities in health persist among children living in poorer regions and neighborhoods, as well as those from economically disadvantaged households. They are more likely to face conditions that worsen health outcomes, particularly ARIs [22]. It is crucial to understand the factors contributing to the inequities in ARI prevalence. It is also important for examining why children from impoverished regions, affected by political instability and religious unrest, are increasingly exposed to air pollution due to migration, thereby increasing their risk of ARI in communities or households [23]. Our research mainly includes determining the factors contributing to regional inequalities and prevalence in acute respiratory infections among children under 5 years in Pakistan. This research focuses on the state of early childhood health in Pakistan and offers a detailed investigation of the factors that contribute to acute respiratory infections. The goal of the research is to provide a unique perspective to the body of literature on child health by focusing on crafting recommendations that are specifically targeted. It is known from previously conducted studies that the prevalence of ARIs is high in children aged under 5 years in Pakistan. However, further research is required to determine the regional inequalities contributing to the high prevalence rate of ARIs. Also, ARI is the leading cause of death in children under 5 years in Pakistan. The existing gaps in this research are that previous studies that were conducted analyzed numerous other factors, but there is limited literature highlighting the regional inequalities related to the soaring prevalence rate of ARIs in Pakistan. The cause could be the absence of census and sample researches on this topic in Pakistan. The new knowledge which will be added in the existing scientific research is that this study will identify the current prevalence and the regional inequalities leading to acute respiratory infections among children under 5 years in Pakistan. Variables such as child's age, gender maternal education, type of residence, household wealth index and characteristics will be assessed. Our research aims to investigate and answer the following questions: What is the prevalence of acute respiratory infections among children under 5 years in Pakistan and what are the factors contributing to regional inequalities in acute respiratory infections among children under 5 years in Pakistan? The objectives of our study is to explore the current prevalence of acute respiratory infections in Pakistan and to determine the factors contributing to regional inequalities in acute respiratory infections among children under 5 years in Pakistan.

METHODOLOGY

Study Design and Study Setting

A cross-sectional study design was adopted, utilizing nationally representative secondary data from the Pakistan Demographic and Health Survey (PDHS) for the year 2017–18. The study setting encompassed urban and rural clusters across Pakistan, ensuring country-wide representation. Study Design and Study Setting

Study Population

The study population included women aged 15–49 years who were ordinary residents of selected households or had spent the prior night there. Only women with children aged 0–59 months were considered for analysis.

Sample Size Estimation

The sample size was derived from the PDHS dataset, which included 18,720 households (5,610 urban and 13,110 rural). A total of 11,645 cases were analyzed after combining children's data with household member data.

Sampling Technique

A two-stage stratified cluster sampling design was employed. The nine administrative provinces of Pakistan were stratified into urban and rural clusters. A total of 624 enumeration areas (187 urban and 437 rural) were selected, with households randomly sampled within these clusters.

Biases and Confounders

Potential biases included selection bias due to the exclusion of non-resident women and recall bias in self-reported ARI symptoms. Confounders such as socioeconomic status, maternal education, and environmental factors were addressed through stratification and multivariate logistic regression analysis.

Data Collection Tool

Data were collected using the PDHS survey instrument, which included questions on sociodemographic variables (e.g., maternal education, household wealth), child health (e.g., ARI symptoms), and environmental factors (e.g., water sources, sanitation).

Method of Data Collection

Trained enumerators conducted face-to-face interviews with eligible women in selected households. Data were collected on child health, including ARI symptoms (cough, short rapid breathing, and chest congestion) over the past two weeks.

Quality Control Measures

To ensure data quality, the PDHS implemented rigorous training for enumerators, field supervision, and data validation checks. During analysis, weighting was applied using the SVY command in statistical software to account for the complex survey design and ensure accurate population estimates.

Data Analysis

Descriptive statistics were used to summarize sociodemographic and child-related variables, with frequencies and percentages calculated for categorical variables. Binary logistic regression analysis was performed to explore associations between ARI prevalence and independent variables, with results reported as odds ratios (OR) and 95% confidence intervals (CI). Statistical significance was assessed at $p < 0.05$.

Ethical Considerations

The study utilized publicly available, de-identified secondary data from the PDHS, eliminating the need for direct interaction with participants. Ethical approval was obtained from the ethical committee of Sohail University, and all necessary authorizations were secured for data use.

Descriptive Statistics results

The age distribution of mothers of the children included in the survey revealed that the majority were aged between 25-29 years, comprising 3,978 individuals, which accounts for 31.7% of the total population. Other age groups included 20-24 years (2,490 participants, or 19.8%), 30-34 years (3,110 participants, or 24.7%), and 35-39 years (1,874 participants, or 14.9%). The younger age group of 15-19 years had the smallest representation with only 389 participants (3.1%), while those aged 40-44 years and 45-49 years represented 4.3% and 1.4%, respectively. In terms of regional distribution, Punjab had the highest representation with 2,703 participants, accounting for 21.5% of the total sample. This was followed by Sindh with 2,257 participants (18.0%) and KPK with 2,082 participants (16.6%). Other regions included Baluchistan (1,498 participants, or 11.9%), GB (907 participants, or 7.2%), ICT (799 participants, or 6.4%), AJK (1,309 participants, or 10.4%), and FATA (1,013 participants, or 8.1%). Regarding educational attainment, a significant portion of the mothers reported having no education at all, with 6,457 individuals (51.4%) falling into this category. Mothers with primary education numbered 1,699 (13.5%), while those with secondary education totaled 2,604 (20.7%). Additionally, there were 1,808 individuals (14.4%) who had received higher education. The wealth index analysis indicated that both the poorest and poorer categories each comprised 2,878 and 2,872 participants respectively, representing 22.9% of the population each. The middle wealth category included 2,489 individuals (19.8%), while the richer and richest categories accounted for 2,183 (17.4%) and 2,146 (17.1%) participants respectively. Finally, the current age distribution of children among participants showed that children aged less than a year had the highest frequency at 2,423 (19.3%). Other age groups included one-year-olds (2,297 participants or 18.3%), two-year-olds (2,382 participants or 19.0%), three-year-olds (2,330 participants or 18.5%), and four-year-olds (2,427 participants or 19.3%). This distribution highlights a relatively even spread across the different ages of children surveyed.

Table 1 Socio demographics of Mother of under five children.

Socio demography	Frequency	Percent
Age in 5-year groups		
15-19	389	3.1
20-24	2490	19.8
25-29	3978	31.7
30-34	3110	24.7
35-39	1874	14.9
40-44	546	4.3
45-49	181	1.4
Region		
Punjab	2703	21.5
Sindh	2257	18
KPK	2082	16.6
Baluchistan	1498	11.9
GB	907	7.2
ICT	799	6.4
AJK	1309	10.4
FATA	1013	8.1
Education Level		
No education	6457	51.4
Primary	1699	13.5
Secondary	2604	20.7
Higher	1808	14.4
Wealth Index		
Poorest	2878	22.9
Poorer	2872	22.9
Middle	2489	19.8
Richer	2183	17.4
Richest	2146	17.1
Current Age of Child in Years		
0	2423	19.3
1	2297	18.3
2	2382	19
3	2330	18.5
4	2427	19.3

Table 2 Frequencies of Respiratory symptoms and ARI in under 5 children

Respiratory Infection Symptoms	Frequency	Percentage
Cough in last Two weeks		
No	7985	63.5
Yes	4583	36.5
Short Rapid Breaths		
No	10364	82.5
Yes	2204	17.5
Problem in the chest and Blocked nose		
No	11580	92.1
Yes	988	7.9
Acute Respiratory Infection		
No	11611	92.4
Yes	957	7.6

The analysis of respiratory infection symptoms among participants revealed significant findings. Regarding cough in the last two weeks, 36.5% of respondents reported experiencing a cough, while 63.5% indicated that they had not. Short rapid breaths were reported by 17.5% of participants, with the majority, 82.5%, stating they had not experienced this symptom. In terms of chest problems and blocked noses, only 7.9% of participants reported these issues, while a significant 92.1% did not experience them. The prevalence of acute respiratory infections was similarly low, with 7.6% of respondents indicating they had experienced such infections, compared to 92.4% who reported no acute respiratory infection symptoms.

The logistic regression analysis aimed to identify factors associated with acute respiratory infections among participants. The results are summarized below, focusing on the significance of various predictors and their corresponding odds ratios (OR) with 95% confidence intervals (C.I.).

Table 3 Logistic Regression Analysis of Socio-Demographic and Environmental Factors Influencing Acute Respiratory Infection (ARI) in Children

Socio demographic	Sig.	OR	95% C.I.
Region			
Punjab	Ref		
Sindh	0.002	1.491	1.165-1.909
KPK	0	2.241	1.772-2.835
Baluchistan	0.208	1.216	0.897-1.648
GB	0.092	1.386	0.948-2.024
ICT	0.93	1.017	0.699-1.48
AJK	0	1.883	1.404-2.524
FATA	0.036	1.414	1.023-1.955
Highest educational level			
No Education	Ref		-
Primary	0.14	1.175	0.948-1.455
Secondary	0.193	1.144	0.934-1.401
Higher	0.129	0.811	0.619-1.062
Piped into dwelling	Ref		-
Piped to yard/plot	0.868	1.034	0.694-1.541
Piped to neighbor	0.177	0.72	0.447-1.16
Public tap/standpipe	0.01	0.638	0.453-0.898
Tube well or borehole	0.508	0.936	0.77-1.139
Protected well	0.809	1.044	0.734-1.487
Unprotected well	0.009	0.447	0.245-0.819
Protected spring	0.035	0.628	0.407-0.968
Unprotected spring	0.002	0.492	0.317-0.763
River/dam/lake/ponds/stream/canal/irrigation channel	0.003	0.466	0.282-0.771
Rainwater	0.998	0	0-.
Tanker truck	0.803	1.077	0.6-1.936
Cart with small tank	0.552	0.721	0.246-2.118
Filtration plant	0.538	0.803	0.399-1.614
Bottled water	0.192	0.627	0.311-1.265
Other	0.962	0.947	0.102-8.799
Not a dejure resident	0.013	0.435	0.226-0.836
Flush to piped sewer system	Ref		-
Flush to septic tank	0.161	1.176	0.937-1.474
Flush to pit latrine	0.419	1.11	0.861-1.432
Flush to somewhere else	0.013	1.592	1.101-2.302
Flush, don't know where	0.222	1.515	0.777-2.954
Ventilated Improved Pit latrine (VIP)	0.885	0.932	0.358-2.425
Pit latrine with slab	0.016	1.638	1.098-2.443
Pit latrine without slab/open pit	0.678	0.893	0.523-1.524
No facility/bush/field	0.243	1.213	0.877-1.676
Composting toilet	0.335	1.324	0.748-2.345
Bucket toilet	0.268	1.459	0.748-2.843
Hanging toilet/latrine	0.639	1.354	0.382-4.804
Other	0.998	0	0-.
Wealth Index			
Poorest	Ref		-
Poorer	0.067	0.81	0.647-1.015
Middle	0.098	0.799	0.613-1.042
Richer	0.346	0.868	0.647-1.165
Richest	0.243	0.818	0.583-1.146
Child is Twin			
Single birth	Ref		-
1st of multiple	0.011	0.269	0.098-0.738
2nd of multiple	0.227	0.651	0.325-1.306
3rd of multiple	0.999	0	0-.
Sex of child			
Male			-
Female	0.858	0.988	0.863-1.13
Current age of child in years			
0	0.006		-
1	0.022	1.274	1.035-1.568
2	0.239	1.136	0.919-1.403
3	0.493	1.078	0.87-1.336
4	0.175	0.857	0.685-1.071
Size at birth			
Very large			-
Larger than average	0.514	0.775	0.36-1.667
Average	0.267	0.661	0.318-1.374
Smaller than average	0.704	1.155	0.549-2.432
Very small	0.174	1.698	0.792-3.641
Don't know	0.505	0.579	0.116-2.89

Regional Factors

The region significantly influenced the likelihood of acute respiratory infections. Participants from Sindh had an OR of 1.491 ($p = 0.002$, 95% C.I. [1.165, 1.909]), indicating they were approximately 49.1% more likely to experience acute respiratory infections compared to those from Punjab (reference group). KPK showed an even stronger association with an OR of 2.241 ($p < 0.001$, 95% C.I. [1.772, 2.835]), suggesting a more than twofold increased risk. AJK also demonstrated a significant association with an OR of 1.883 ($p < 0.001$, 95% C.I. [1.404, 2.524]). In contrast, Baluchistan (OR = 1.216, $p = 0.208$) and GB (OR = 1.386, $p = 0.092$) did not show statistically significant associations.

Educational Level

Educational attainment was also examined, with no education serving as the reference category. Individuals with primary education had an OR of 1.175 ($p = 0.140$), while those with secondary education had an OR of 1.144 ($p = 0.193$). Interestingly, higher education was associated with a decreased likelihood of acute respiratory infections (OR = 0.811, $p = 0.129$), although this was not statistically significant.

Water Source

The source of water supply revealed notable associations as well. Participants using public taps/standpipes had significantly lower odds of acute respiratory infections (OR = 0.638, $p = 0.01$, 95% C.I. [0.453, 0.898]). Conversely, those relying on unprotected wells had an OR of 0.447 ($p = 0.009$), indicating a reduced risk associated with this water source.

Wealth Index

The wealth index categories showed varying degrees of association with acute respiratory infections compared to the poorest category (reference). The poorer category approached significance with an OR of 0.810 ($p = 0.067$), while the middle category had an OR of 0.799 ($p = 0.098$). The richer and richest categories did not demonstrate significant associations.

Child Characteristics

Child-related factors were also analyzed, revealing that being the first of multiple births significantly decreased the odds of experiencing acute respiratory infections (OR = 0.269, $p = 0.011$). In terms of age, children aged one year had an OR of 1.274 ($p = 0.022$), indicating a higher likelihood of infection compared to younger children.

DISCUSSION:

Our study aimed to identify and investigate the determinants of regional disparities and prevalence of acute respiratory infections (ARIs) in children under 5 years in Pakistan. This study showed that the incidence of acute respiratory infections (ARIs) among children under 5 has been raised since the last year. It revealed significant insights into maternal, regional, educational, and child-related factors influencing ARIs among participants. The majority of mothers were aged between 25–29 years, with regional and socioeconomic disparities prominently affecting ARI prevalence. Educational attainment and water sources also emerged as potential contributors to the observed health outcomes.

Various socio-economic factors showed a relationship between ARIs and all the mentioned factors. Previous studies have endorsed the findings of our study. The age distribution of mothers was skewed toward the 25–29 age group, which aligns with the demographic trend of childbearing years, as mentioned in previously conducted studies. While educational attainment revealed a high proportion of mothers with no education, it was interesting that higher education was associated with reduced odds of ARIs, albeit not statistically significant. This suggests that maternal education may play a protective role by promoting better hygiene practices, healthcare utilization, or awareness, even though the exact pathways require further exploration, as mentioned in Aftab et al., 2022. Regional differences significantly influenced ARI prevalence. Sindh, KPK and AJK exhibited higher odds of ARIs as compared to Punjab. These findings suggest potential regional disparities in healthcare access, environmental factors (e.g., air quality, overcrowding), or cultural practices, aligning with the findings of Speybroeck et al., 2010. In contrast, regions like Balochistan and GB showed no significant associations, possibly due to smaller sample sizes or unmeasured confounders. The type of water source emerged as a critical determinant of ARIs. Access to public taps/standpipes significantly reduced the risk of ARIs likely due to improved water quality and reduced contamination risks. Similarly, reliance on unprotected wells indicated a counterintuitive association, which could be attributed to contextual factors such as fewer contaminants in rural or less crowded settings. These findings underscore the importance of clean water access in reducing respiratory infections, like so in Ullah et al., 2019. The wealth index showed nuanced associations with ARIs. While the "poorer" and "middle" wealth categories approached significance no clear trend was observed for the richer categories. This indicates that while poverty may exacerbate ARI risks, intermediate wealth levels do not necessarily guarantee significant protection, likely due to persistent exposure to environmental or structural health barriers. Similar findings are mentioned in Hosseinpoor et al., 2006. Children's age and birth order were significant predictors of ARI risk. One-year-olds had increased odds of infection, possibly reflecting heightened vulnerability due to immature immune systems combined with increased exposure to environmental pathogens as mobility increases. First-born children showed reduced odds of ARIs, which may reflect better parental attention or fewer competing demands in resource-limited households. These findings are consistent with Kyu et al., 2016. The findings of our study highlight several critical factors influencing ARI prevalence, with practical implications for public health strategies. Regions such as Sindh, KPK, and AJK require targeted interventions to address the underlying contributors to ARIs, including improved healthcare access and environmental management. Efforts to enhance maternal education, particularly among underserved populations, could improve child health outcomes by fostering better hygiene and healthcare practices. Strengthening water supply infrastructure, particularly access to safe drinking water, could play a pivotal role in reducing respiratory infections. While the study provides robust insights, several limitations should be acknowledged. The cross-sectional design limits causal inferences between predictors and ARI outcomes. Variables such as air pollution, vaccination status, and healthcare utilization were not included, potentially influencing the observed associations. Differences in sample sizes across regions may have affected statistical power, particularly for Balochistan and GB. Future research should adopt longitudinal designs to confirm causal relationships and explore additional environmental and behavioral determinants of ARIs. Investigating interventions tailored to high-risk regions and demographics would further refine public health strategies.

LIMITATION:

However, there are some limitations to our study. We are unable to give the causal inference of our study.

CONCLUSION:

In conclusion, this study underscores the multifaceted nature of ARI risk factors, emphasizing the role of regional disparities, maternal education, water access, and child characteristics. By addressing these factors, policymakers can design more effective interventions to mitigate respiratory infections and improve child health outcomes across diverse populations.

Recommendations:

To reduce prevalence of ARIs among children under 5 years, it is recommended to apply approaches that address medical, environmental and socio-economic factors. It is important to promote exclusive breastfeeding, hygiene and handwashing practices, ensure proper nutrition, ensure access to clean water, improve indoor air quality, enhance healthcare, improve immunization, improve maternal and child health, improve cooking practices, encourage environmental improvements and encourage public education and awareness.

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AUTHORS CONTRIBUTIONS

Conceptualization: SM
Data Curation: SM
Formal Analysis: JK
Funding Acquisition: OK
Investigation: OK
Methodology: OK, HA
Project Administration: SM
Resources: MH
Software: JK
Supervision: SM
Validation: SM
Visualization: MH
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What is already known about this topic

- Identifies regional disparities in ARI prevalence among children under five in Pakistan, with Sindh, KPK, and AJK showing significantly higher risks compared to Punjab.
- Highlights the potential protective role of maternal education, particularly higher education, in reducing ARI prevalence, even if not statistically significant.
- Demonstrates the importance of clean water access, with public taps significantly lowering ARI risk, while unprotected wells showed a counterintuitive protective effect.
- Provides evidence that wealth alone does not guarantee protection against ARIs, emphasizing the need for targeted interventions addressing environmental and healthcare access issues.

What this study adds to the current literature

- ARIs are a leading cause of morbidity and mortality among children under five globally, particularly in low- and middle-income countries like Pakistan.
- Socioeconomic factors, such as poverty, poor sanitation, and lack of education, contribute significantly to the high prevalence of ARIs.
- Maternal education and access to clean water are known to improve child health outcomes, including reducing the risk of respiratory infections.
- Regional disparities in healthcare access and environmental conditions exacerbate the burden of ARIs in underserved areas.

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ملخص

خلفية

تُعَدُّ التهابات الجهاز التنفسي الحادة (ARIs) من الأسباب الرئيسية للمراضة والوفيات بين الأطفال دون سن الخامسة في باكستان، مما يعكس الفجوات الأوسع في المجالات الاجتماعية والاقتصادية والرعاية الصحية. تدرس هذه الدراسة انتشار التهابات الجهاز التنفسي الحادة والفوارق الإقليمية التي تساهم في ارتفاع معدل حدوثها، باستخدام بيانات من المسح الديموغرافي والصحي في باكستان لعام 2017-2018.

الطرق

تم استخدام تصميم مقطعي، حيثٍ تم تحليل العوامل الاجتماعية والديموغرافية والبيئية والمتعلقة بالأطفال بين 11,645 طفلًا تحت سن الخامسة. تم استخدام الإحصاءات الوصفية والانحدار اللوجستي لتحديد العوامل الرئيسية المسببة للعدوى التنفسية الحادة. شملت المتغيرات تعليم الأم، ثروة الأسرة، مصادر المياه، والتوزيع الإقليمي.

النتائج

كانت نسبة انتشار التهابات الجهاز التنفسي الحادة 7.6%، مع تفاوتات إقليمية كبيرة. كان لديٍ الأطفال في السند، وKPK، وAJK احتمالات أعلى للإصابة بالتهابات الجهاز التنفسي الحادة مقارنةً بالبنجاب. كان التعليم الأمومي، وخاصة التعليم العالي، مرتبطًا بانخفاض انتشار التهابات الجهاز التنفسي الحادة، على الرغم من أنه لم يكن ذا دلالة إحصائية. الوصول إلى مصادر المياه النظيفة، مثل الصنابير العامة، خفض بشكل كبير من خطر الإصابة بالتهابات الجهاز التنفسي الحادة. أظهرت فئات مؤشر الثروة عدم وجود اتجاه واضح، بينما أثرت العوامل المتعلقة بالأطفال، مثل العمر وترتيب الميلاد، على انتشار التهاب الجهاز التنفسي الحاد.

الاستنتاجات

تسلط الدراسة الضوء على أهمية معالجة الفجوات الإقليمية، وتحسين تعليم الأمهات، وضمان الوصول إلى المياه النظيفة لتقليل انتشار التهابات الجهاز التنفسي الحادة. التدخلات المستهدفة في المناطق عالية المخاطر، جنبًا إلى جنب مع استراتيجيات الصحة العامة التي تعزز النظافة والتطعيم والوصول إلى الرعاية الصحية، ضرورية للتخفيف من التهابات الجهاز التنفسي الحادة وتحسين نتائج صحة الأطفال في باكستان.

الكلمات المفتاحية

العدوى التنفسية الحادة، صحة الأطفال، الفجوات الإقليمية، تعليم الأمهات، الوصول إلى المياه النظيفة، التدخلات الصحية العامة.

تجریدی پس منظر

ابتدائیه

شدید سانس کے انفیکشن (اے آر آئی) پاکستان میں پانچ سال سے کم عمر کے بچوں میں بیماری اور اموات کی ایک اہم وجہ ہیں ، جو وسیع تر سماجی و اقتصادی اور صحت کی دیکھ بھال میں عدم مساوات کی عکاسی کرتے ہیں ۔ یہ مطالعہ 2017-18 پاکستان ڈیموگرافک اینڈ ہیلتھ سروے (پی ڈی ایچ ایس) کے اعداد و شمار کا استعمال کرتے ہوئے ، اے آر آئی کے پھیلاؤ اور ان کے اعلی واقعات میں حصہ لینے والی علاقائی عدم مساوات کی تحقیقات کرتا ہے ۔

طریقے

پانچ سال سے کم عمر کے 11,645 بچوں میں سماجی آبادیاتی ، ماحولیاتی اور بچوں سے متعلق عوامل کا تجزیہ کرتے ہوئے ایک کراس سیکشنل ڈیزائن کا استعمال کیا گیا ۔ اے آر آئی کے کلیدی تعین کاروں کی شناخت کے لیے وضاحتی اعداد و شمار اور لاجسٹک رجعت کا استعمال کیا گیا ۔ متغیرات میں زچگی کی تعلیم ، گھریلو دولت ، پانی کے ذرائع ، اور علاقائی تقسیم شامل تھے ۔

نتائج

اہم علاقائی عدم مساوات کے ساتھ اے آر آئی کا پھیلاؤ 7.6 فیصد تھا ۔ سندھ ، کے پی کے ، اور اے جے کے کے بچوں میں پنجاب کے مقابلے میں اے آر آئی کے زیادہ امکانات تھے ۔ زچگی کی تعلیم ، خاص طور پر اعلی تعلیم ، اے آر آئی کے پھیلاؤ میں کمی سے وابستہ تھی ، حالانکہ اعداد و شمار کے لحاظ سے اہم نہیں تھی ۔ صاف پانی کے ذرائع تک رسائی ، جیسے کہ عوامی نل ، نے اے آر آئی کے خطرے کو نمایاں طور پر کم کر دیا ۔ ویلتھ انڈیکس کے زمروں نے کوئی واضح رجحان نہیں دکھایا ، جبکہ بچوں سے متعلق عوامل ، جیسے عمر اور پیدائشی ترتیب نے اے آر آئی کے پھیلاؤ کو متاثر کیا ۔

نتائج

یہ مطالعہ علاقائی عدم مساوات کو دور کرنے ، زچگی کی تعلیم کو بہتر بنانے اور اے آر آئی کے پھیلاؤ کو کم کرنے کے لیے صاف پانی تک رسائی کو یقینی بنانے کی اہمیت پر روشنی ڈالتا ہے ۔ زیادہ خطرے والے علاقوں میں ہدف شدہ مداخلت ، حفظان صحت ، ویکسینیشن اور صحت کی دیکھ بھال تک رسائی کو فروغ دینے والی صحت عامہ کی حکمت عملیوں کے ساتھ مل کر ، اے آر آئی کو کم کرنے اور پاکستان میں بچوں کی صحت کے نتائج کو بہتر بنانے کے لیے ضروری ہے ۔

کلیدی الفاظ: شدید سانس کے انفیکشن ، بچوں کی صحت ، علاقائی عدم مساوات ، زچگی کی تعلیم ، صاف پانی تک رسائی ، صحت عامہ کی مداخلت ۔

摘要

背景

急性呼吸道感染 (ARI) 是巴基斯坦五岁以下儿童发病和死亡的主要原因，反映了更广泛的社会经济和医疗保健差距。 本研究利用 2017-18 年巴基斯坦人口与健康调查 (PDHS) 的数据，调查了 ARI 的患病率以及导致其高发病率的区域不平等现象。

方法

采用横断面设计，分析了 11645 名五岁以下儿童的社会人口、环境和儿童相关因素。 描述性统计和逻辑回归用于确定急性呼吸道感染的关键决定因素。 变量包括母亲教育程度、家庭财富、水源和区域分布。

结果

急性呼吸道感染的患病率为 7.6%，存在显著的区域差异。 与旁遮普省相比，信德省、开伯尔-普赫图赫瓦省和阿扎德克什米尔省的儿童患急性呼吸道感染的几率更高。 母亲的教育程度，尤其是高等教育，与 ARI 患病率的降低有关，但统计学意义不显著。 获得清洁水源，如公共水龙头，显著降低了急性呼吸道感染的风险。 财富指数类别没有显示出明显的趋势，而儿童相关因素，如年龄和出生顺序，影响了 ARI 的流行。

结论

该研究强调了解决区域差异、提高母亲教育水平以及确保获得清洁用水对于降低 ARI 患病率的重要性。 在高危地区采取有针对性的干预措施，再加上促进卫生、疫苗接种和医疗保健的公共卫生战略，对于减轻急性呼吸道感染和改善巴基斯坦儿童的健康状况至关重要。

关键词

急性呼吸道感染、儿童健康、区域差异、母亲教育、清洁用水、公共卫生干预。

Resumen

Antecedentes

Las infecciones respiratorias agudas (IRA) son una de las principales causas de morbilidad y mortalidad entre los niños menores de cinco años en Pakistán, reflejando disparidades socioeconómicas y de atención médica más amplias. Este estudio investiga la prevalencia de las infecciones respiratorias agudas (IRA) y las desigualdades regionales que contribuyen a su alta incidencia, utilizando datos de la Encuesta Demográfica y de Salud de Pakistán 2017-18 (PDHS).

Métodos

Se empleó un diseño transversal, analizando factores sociodemográficos, ambientales y relacionados con los niños entre 11,645 niños menores de cinco años. Se utilizaron estadísticas descriptivas y regresión logística para identificar los determinantes clave de las IRA. Las variables incluyeron la educación materna, la riqueza del hogar, las fuentes de agua y la distribución regional.

Resultados

La prevalencia de las IRA fue del 7.6%, con disparidades regionales significativas. Los niños en Sindh, KPK y AJK tenían mayores probabilidades de ARIs en comparación con Punjab. La educación materna, particularmente la educación superior, se asoció con una menor prevalencia de IRA, aunque no de manera estadísticamente significativa. El acceso a fuentes de agua limpia, como los grifos públicos, redujo significativamente el riesgo de IRA. Las categorías del índice de riqueza no mostraron una tendencia clara, mientras que los factores relacionados con los niños, como la edad y el orden de nacimiento, influyeron en la prevalencia de ARI.

Conclusiones

El estudio destaca la importancia de abordar las disparidades regionales, mejorar la educación materna y garantizar el acceso a agua limpia para reducir la prevalencia de las IRA. Las intervenciones dirigidas en regiones de alto riesgo, junto con estrategias de salud pública que promuevan la higiene, la vacunación y el acceso a la atención médica, son esenciales para mitigar las IRA y mejorar los resultados de salud infantil en Pakistán.

Palabras clave

Infecciones respiratorias agudas, salud infantil, disparidades regionales, educación materna, acceso a agua limpia, intervenciones de salud pública.

Аннотация

Введение

Острые респираторные инфекции (ОРВИ) являются ведущей причиной заболеваемости и смертности среди детей в возрасте до пяти лет в Пакистане, что отражает более широкое социально-экономическое неравенство и различия в системе здравоохранения. В данном исследовании изучается распространенность ОРВИ и региональные неравенства, способствующие их высокой заболеваемости, с использованием данных Пакистанского демографического и медицинского обследования (PDHS) за 2017-18 годы.

Методы

Было использовано поперечное исследование, проанализировавшее социально-демографические, экологические и связанные с детьми факторы среди 11 645 детей в возрасте до пяти лет. Для выявления ключевых детерминант ОРВИ использовались описательная статистика и логистическая регрессия. Переменные включали образование матери, благосостояние домохозяйства, источники воды и региональное распределение.

Результаты

Распространенность ОРВИ составила 7,6%, при этом наблюдались значительные региональные различия. У детей в Синдхе, Хайбер-Пахтунхва и Азад-Кашмире вероятность развития ОРВИ была выше, чем в Пенджабе. Образование матери, особенно высшее, было связано со снижением распространенности ОРВИ, хотя и не статистически значимым. Доступ к чистым источникам воды, таким как общественные краны, значительно снизил риск ОРВИ. Категории индекса благосостояния не показали четкой тенденции, в то время как факторы, связанные с детьми, такие как возраст и очередность рождения, влияли на распространенность ОРВИ.

Выводы

Исследование подчеркивает важность решения региональных диспропорций, улучшения образования матерей и обеспечения доступа к чистой воде для снижения распространенности ОРВИ. Целевые мероприятия в регионах высокого риска в сочетании со стратегиями общественного здравоохранения, направленными на продвижение гигиены, вакцинации и доступа к медицинской помощи, имеют решающее значение для смягчения ОРВИ и улучшения показателей здоровья детей в Пакистане.

Ключевые слова: острые респираторные инфекции, здоровье детей, региональные различия, образование матерей, доступ к чистой воде, мероприятия в области общественного здравоохранения.

Résumé

Contexte

Les infections respiratoires aiguës (IRA) sont une cause principale de morbidité et de mortalité chez les enfants de moins de cinq ans au Pakistan, reflétant des disparités socioéconomiques et de santé plus larges. Cette étude examine la prévalence des IRA et les inégalités régionales contribuant à leur incidence élevée, en utilisant les données de l'Enquête Démographique et de Santé du Pakistan (PDHS) 2017-18.

Méthodes

Une conception transversale a été employée, analysant les facteurs socio-démographiques, environnementaux et liés à l'enfant parmi 11 645 enfants de moins de cinq ans. Des statistiques descriptives et une régression logistique ont été utilisées pour identifier les principaux déterminants des IRA. Les variables incluaient l'éducation maternelle, la richesse du ménage, les sources d'eau et la distribution régionale.

Résultats

La prévalence des IRA était de 7,6 %, avec des disparités régionales significatives. Les enfants du Sindh, du KPK et de l'AJK avaient des probabilités plus élevées de contracter des IRA par rapport au Pendjab. L'éducation maternelle, en particulier l'enseignement supérieur, était associée à une réduction de la prévalence des IRA, bien que cela ne soit pas statistiquement significatif. L'accès à des sources d'eau propre, telles que les robinets publics, a considérablement réduit le risque d'IRA. Les catégories d'indice de richesse n'ont montré aucune tendance claire, tandis que les facteurs liés à l'enfant, tels que l'âge et l'ordre de naissance, ont influencé la prévalence des IRA.

Conclusions

L'étude souligne l'importance de traiter les disparités régionales, d'améliorer l'éducation maternelle et de garantir l'accès à l'eau potable pour réduire la prévalence des IRA. Les interventions ciblées dans les régions à haut risque, associées à des stratégies de santé publique promouvant l'hygiène, la vaccination et l'accès aux soins de santé, sont essentielles pour atténuer les IRA et améliorer les résultats de santé infantile au Pakistan.

Mots-clés

Infections respiratoires aiguës, santé infantile, disparités régionales, éducation maternelle, accès à l'eau potable, interventions de santé publique.

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