

Assessment and Comparison of Mothers' Knowledge Regarding Common Illnesses among Under-Five Children in Urban and Rural Areas of Navi Mumbai: Development of an Information Booklet

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ABSTRACT

Background: Acute respiratory infection, diarrhoea and malaria remain leading causes of morbidity and mortality among under-five children in India, and prompt home recognition by mothers can prevent complications. Comparing maternal knowledge across urban and rural settings can guide targeted health education.

Objectives: To assess and compare the knowledge of urban and rural mothers of under-five children regarding common childhood illnesses (acute respiratory infection, diarrhoea and malaria), to determine its association with selected demographic variables, and to develop an information booklet.

Materials and Methods: A comparative descriptive design with a quantitative approach was used. Non-probability convenient sampling was used to recruit 110 urban and 110 rural mothers (N = 220) of under-five children from selected areas of Navi Mumbai. Data were collected using a validated and reliable (urban $r = 0.768$; rural $r = 0.801$) self-structured 25-item knowledge questionnaire administered as a structured interview. Data were analysed using descriptive statistics, the independent Student's t-test and the chi-square test (SPSS v22.0).

Results: Urban mothers had a mean knowledge score of 15.8 (SD 2.24) against 12.24 (SD 3.02) for rural mothers; the difference was statistically significant ($t = 9.93$, $p < 0.00001$). Good knowledge (51%) predominated among urban mothers, whereas average knowledge (57%) predominated among rural mothers, with 31% of rural mothers scoring poor/very poor. Knowledge score was significantly associated with occupational status and previous knowledge of the illnesses among urban mothers ($p < 0.05$); no other demographic association reached significance in either group.

Conclusion: Rural mothers had significantly lower knowledge of common childhood illnesses than urban mothers. A validated, illustrated information booklet was developed to address this gap and is recommended as a low-cost strategy to strengthen home-based recognition and management of ARI, diarrhoea and malaria among under-five children.

Keywords: Assess; Knowledge; Common illness; Mothers; Under-five; Information booklet; Urban; Rural.

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INTRODUCTION

—Children are wealth of tomorrow, take care of them if you wish to have a strong India ever ready to meet various challenges! — Pandit Jawaharlal Nehru. The health status of children in their early years shapes the future of a nation, and maternal knowledge and practice in managing common illnesses are central to preventing complications and reducing hospitalisation.¹

Acute respiratory infection (ARI), diarrhoea and malaria continue to dominate the global burden of under-five morbidity and mortality, and improving maternal knowledge of these conditions has repeatedly been identified as a priority for child survival programmes.² ARI presents with a combination of cough, running or blocked nose, sore throat, noisy or rapid

breathing, feeding difficulty and chest indrawing, and remains a leading cause of death in children under five in developing countries, accounting for an estimated 12 million deaths annually and roughly one-fifth of all under-five deaths.^{3,4} Diarrhoea is the third most common cause of under-five death, responsible for around 13% of deaths in this age group and an estimated 300,000 child deaths in India each year.⁵ Malaria disproportionately affects children under five who have not yet developed immunity, and survivors may face long-term neurological and cognitive sequelae along with substantial economic consequences for their families.⁶

Globally, an estimated 21 children die every minute before their fifth birthday, and WHO estimates around

2.1 million annual deaths related to ARI — about

20% of all childhood deaths.^{9,10} UNICEF (2018) attributes most under-five deaths worldwide to diarrhoea, malaria, pneumonia (ARI), tuberculosis and HIV, with pneumonia, diarrhoea and malaria together accounting for roughly 29% of global under-five deaths in 2019.¹¹ In India, of the children who die before age five, the leading causes are prematurity (77%), ARI (14%), birth asphyxia (11%), diarrhoea (11%), neonatal sepsis (8%), congenital anomalies (6%), injuries (4%) and measles (2%).¹³ Nearly 70% of under-five deaths are attributable to a small cluster of common illnesses — ARI, diarrhoea, measles, malaria and malnutrition.¹⁴

Poor environmental sanitation, inadequate water supply and crowded living conditions in both urban slums and rural settings further compound the risk to child health.¹⁷ Because most of these threats can be managed at home if recognised early, a mother's knowledge, prompt response and timely care-seeking during danger signs are often the deciding factor between a manageable illness and a life-threatening complication; delayed or absent care-seeking remains a major contributor to preventable under-five deaths in developing countries.¹⁸

Community-based studies from India report similarly mixed levels of maternal awareness: caregivers frequently recognise cold/cough and chest indrawing as signs of pneumonia but far fewer identify fast or difficult breathing as a danger sign, and only a minority demonstrate adequate knowledge of risk factors and preventive measures.¹⁸ Given that under-five children remain the group most vulnerable to ARI, diarrhoea and malaria, and that India is home to nearly a fifth of the world's children, assessing and strengthening mothers' knowledge — particularly across the urban–rural divide — is essential to reducing childhood morbidity and mortality.¹⁹

The investigators' clinical experience in paediatric settings, where children were repeatedly admitted with preventable complications of ARI, diarrhoea and malaria because mothers could not recognise worsening illness in time, motivated this study. The present study was therefore undertaken to assess and compare the knowledge of urban and rural mothers of under-five children in Navi Mumbai regarding these three common illnesses, and to develop an information booklet to help close the identified knowledge gap.

Objectives of the Study

1. To assess the knowledge regarding common illness among mothers of under-five children in selected urban and rural areas.
2. To compare the knowledge regarding

common illness among mothers of under-five children in the selected urban and rural areas.

3. To determine the association between the level of knowledge regarding common illness and selected demographic variables.
4. To develop and validate an information booklet on common illnesses among under-five children.

MATERIALS AND METHODS

Research Approach, Design and Setting

A quantitative research approach with a comparative descriptive design was adopted. The study was conducted in selected urban and rural areas of Navi Mumbai, Maharashtra, India, between July 2019 and March 2021.

Population and Sample

The population comprised mothers of children aged 1–5 years residing in the selected urban and rural areas of Navi Mumbai. Using non-probability convenient sampling, 220 mothers were recruited — 110 from urban and 110 from rural areas.

Inclusion criteria: mothers with children aged 1–5 years, able to understand Hindi or Marathi, available at the time of data collection, and residing in the selected urban or rural area. Exclusion criteria: mothers who had previously participated in a similar study, mothers of chronically ill children, and mothers employed as health personnel.

Data Collection Tool

A self-structured knowledge questionnaire was developed following a review of the literature and expert consultation. The tool comprised two sections: Section I collected 12 items of demographic data (maternal age, number of under-five children, educational status, occupational status, type of family, religion, monthly family income, source of health information, and type of treatment sought). Section II comprised 25 knowledge items covering ARI, diarrhoea and malaria across the domains of knowledge (60%), understanding (30%) and application (10%). Each correct response scored 1 and each incorrect response scored 0, giving a possible range of 1–25, interpreted as very poor (1–5), poor (6–10), average (11–15), good (16–20) and very good (21–25).

Validity and Reliability

Content validity was established by 19 of 25 experts (nursing faculty, paediatricians, PSM department faculty and a statistician), and the tool was modified according to their suggestions. Reliability was established using the test–retest method (Pearson product-moment correlation) on

29 urban and 29 rural mothers not included in the main study, yielding $r = 0.768$ for the urban tool and $r = 0.801$ for the rural tool, indicating acceptable reliability.

Pilot Study and Data Collection Procedure

A pilot study was conducted on 20 mothers (10 urban, 10 rural) in November 2020 to test feasibility and finalise the plan of statistical analysis. For the main study, after obtaining formal permission from the concerned municipal and village authorities and written informed consent from participants, data were collected through structured interviews of 15–20 minutes' duration per participant.

Ethical Considerations

Ethical clearance was obtained from the institutional ethics committee. Formal permission was obtained from local authorities (municipal councillor and village sarpanch), and written informed consent was obtained from all participants; confidentiality was assured throughout.

Plan of Data Analysis

Data were analysed using SPSS version 22.0 and MS Excel. Demographic characteristics were summarised using frequency and percentage. Knowledge scores were summarised using frequency, percentage, mean and standard deviation. The independent Student's t-test was used to compare urban and rural knowledge scores, and the chi-square test was used to determine associations between knowledge level and selected demographic variables, at a 5% level of significance.

RESULTS

Data from 110 urban and 110 rural mothers ($N = 220$) were analysed and presented under four sections: demographic characteristics, level of knowledge, comparison of knowledge between groups, and association of knowledge with demographic variables.

Section I: Demographic Characteristics

Table 1. Distribution of selected demographic characteristics of urban and rural mothers ($N = 220$)

Variable	Category	Urban n (%)	Rural n (%)	Total n (%)
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Age (years)	20–25	28 (25%)	87 (%)	36 (14.6%)
	25–30	52 (47%)	43 (39%)	95 (43%)
	30–35	25 (23%)	40 (40%)	65 (30%)
	35–40	4 (4%)	14 (13%)	18 (8.2%)
	40–45	1 (1%)	1 (1%)	2 (0.9%)
No. of under-5 children	One	61 (55%)	94 (86%)	155 (70.5%)
	Two	47 (43%)	17 (15%)	64 (29.5%)

		)		%)
	Thre e	2 (2 %))	1 (1 %)	3 (1 · 4 %)
Ed uca tion	Prim ary	1 (1 %)	1 1 (1 0 %)	1 2 (5 · 5 %)
	Seco ndar y	8 (7 %)	5 2 (4 7 %)	6 0 (2 7 · 3 %)
	Hig her seco ndar y	4 0 (3 6 %)	3 5 (3 2 %)	7 5 (3 4 · 1 %)
	Gra duat e	6 0 (5 5 %)	1 1 (0 %)	7 1 (3 2 · 3 %)
	Post - grad uate	1 (1 %)	1 (1 %)	2 (0 · 9 %)
Occ upa tion	Hou sem aid	1 (1 %)	1 0 (9 %)	1 1 (5 · 0 %)
	Hou	9	8	1

	sewi fe	2 (8 4 %)	3 (7 5 %)	7 5 (7 9 · 5 %)
	Serv ice	6 (5 %)	2 5 (2 3 %)	3 1 (1 4 · 1 %)
	Busi ness	1 (1 %)	2 (2 %)	3 (1 · 4 %)
Rel igio n	Hin du	1 0 6 (9 6 %)	1 1 0 (1 0 0 %)	2 1 6 (9 8 · 2 %)
	Chri stian	2 (2 %)	0 (0 %)	2 (0 · 9 %)
	Mus lim	2 (2 %)	0 (0 %)	2 (0 · 9 %)
Ty pe of fam ily	Nucl ear	2 7 (2 5 %)	7 2 (6 5 %)	9 9 (4 5 · 0 %)
	Joint	8 0	3 7	1 1

		(7 3 %))	(3 4 %)	7 (5 3 . 2 %)
	Exte nded	3 (3 %)	1 (1 %)	4 (1 . 8 %)
Mo nthl y inc om e (₹)	> 32,0 50	2 7 (2 5 %)	5 0 (4 5 %)	7 7 (3 5 . 3 %)
	16,0 20– 32,0 49	7 4 (6 7 %)	5 8 (5 3 %)	1 3 2 (6 0 . 0 %)
	12,0 20– 16,0 19	7 (6 %)	1 (1 %)	8 (3 . 6 %)
	8,01 0– 12,0 19	2 (2 %)	1 (1 %)	3 (1 . 4 %)
Sou rce of info rma tion	Heal th prof essi onal s	9 0 (8 2 %)	2 9 (2 6 %)	1 1 9 (5 4 . 1 %)
	Mult ime	5	5 8	6 3

	dia	(5 %)	(5 3 %)	(2 8 . 6 %)
	Fam ily me mbe rs	5 (5 %)	2 1 (1 9 %)	2 6 (1 1 . 8 %)
	Frie nds	1 0 (9 %)	2 (2 %)	1 2 (5 . 5 %)

Variable	Category	Urban n (%)	Rural n (%)	Total n (%)
Treatment sought	Both home & medical	88 (80%)	52 (47%)	140 (63.6%)
	Home remedy only	20 (18%)	8 (7%)	28 (12.7%)
	Medical only	1 (1%)	49 (45%)	50 (22.7%)
Child immunised	Yes	108 (98%)	109 (99%)	217 (98.6%)
Complementary feeding started	At 6 months	19 (17%)	32 (29%)	51 (23.2%)
	After 6 months	91 (83%)	78 (71%)	169 (76.8%)

Most mothers in both groups were aged 25–35 years, were housewives, belonged to nuclear or joint Hindu families, and had immunised their children (98–99%). Urban mothers were more often graduates (55%) living in joint families (73%) with one child (55%) and drew information mainly from health professionals (82%), whereas rural mothers were more often educated up to secondary level (47%), living in nuclear families (65%) with one child (84%), and relied mainly on multimedia (53%) for health information. Urban mothers more often combined home remedies with medical treatment (80%) while nearly half of rural mothers (45%) relied on medical treatment alone.

Section II: Level of Knowledge Regarding Common Illnesses

Table 2. Level of knowledge regarding common illness among urban and rural mothers (N = 220)

Knowledge level (score)	Urban mothers n (%)	Rural mothers n (%)
Very poor (1–5)	0 (0%)	0 (0%)
Poor (6–10)	3 (3%)	34 (31%)
Average (11–15)	51 (46%)	63 (57%)
Good (16–20)	56 (51%)	13 (12%)
Very good (21–25)	0 (0%)	0 (0%)

Good knowledge predominated among urban mothers (51%), while average knowledge predominated among rural mothers (57%); nearly a third of rural mothers (31%) scored poor, compared with only 3% of urban mothers. No mother in either group scored very poor or very good.

Table 3. Mean knowledge score of urban and rural mothers (N = 220)

Group	n	Mean score	SD
Urban mothers	110	15.81	2.24
Rural mothers	110	12.25	3.04

Section III: Comparison of Knowledge Between Urban and Rural Mothers

Table 4. Comparison of knowledge scores of urban and rural mothers (N = 220)

Group	n	Mean	SD	t-value	p-value	Significance
Urban	110	15.80	2.24	9.93	< 0.00001	S (p < 0.05)
Rural	110	12.24	3.02			

The mean knowledge score of urban mothers (15.80 ± 2.24) was significantly higher than that of rural mothers (12.24 ± 3.02); the calculated t-value (9.93) exceeded the table value at the 5% level ($p < 0.00001$), confirming a statistically significant difference in knowledge between the two groups.

Section IV: Association Between Knowledge Score and Demographic Variables

Table 5. Association between knowledge score and selected demographic variables (chi-square test)

Demographic variable	χ^2 (Urban)	p-value (Urban)	χ^2 (Rural)	p-value (Rural)	Significance
Age	9.70	0.138	3.97	0.680	NS
No. of under-5 children	0.98	0.612	3.04	0.551	NS
Educational status	4.53	0.605	4.06	0.668	NS
Occupational status	17.96	0.0063	5.26	0.511	S for Urban (p < 0.05)
Type of family	0.93	0.629	0.98	0.913	NS
Previous knowledge of illness	10.89	0.0043	1.75	0.416	S for Urban (p < 0.05)

Knowledge score showed a statistically significant association with occupational status ($\chi^2 = 17.96$, $p = 0.0063$) and with previous knowledge of the illness ($\chi^2 = 10.89$, $p = 0.0043$) among urban mothers only. No other demographic variable showed a significant association with knowledge score in either group, and no demographic variable was significantly associated with knowledge score among rural mothers.

DISCUSSION

This comparative study of 220 mothers of under-five children in Navi Mumbai found a statistically significant urban–rural gap in knowledge of common childhood illnesses, with urban mothers (mean 15.80) scoring markedly higher than rural mothers (mean 12.24, $t = 9.93$, $p < 0.00001$). This pattern is consistent with the wider literature: better access to health professionals, higher educational attainment and higher family income in urban settings appear to translate into stronger recognition of illness and its danger signs.

The demographic profile helps explain this gap. Urban mothers were more often graduates and drew their information predominantly from health professionals (82%), whereas rural mothers were more often educated only to secondary level and relied mainly on multimedia (53%) rather than direct professional contact — a source that may not consistently convey accurate or complete illness-related information. A comparable descriptive study among 100 mothers by Patali (2018) similarly found that most mothers were of secondary/higher-secondary education and were largely housewives, underscoring how educational and occupational profiles recur across community samples and shape baseline health knowledge.

The knowledge-level distribution mirrors these findings: half of urban mothers (51%) demonstrated good knowledge compared with only 12% of rural mothers, while 57% of rural mothers fell in the average band and 31% scored poor — a substantially higher proportion of low scorers than in the urban group. A comparable urban–rural gradient was reported by Manu et al. (2019) in a study of maternal knowledge of severe acute malnutrition, where urban mothers again showed a higher proportion of moderate-to-adequate knowledge than their rural counterparts.

Only occupational status and previous knowledge of the illness were significantly associated with knowledge score, and only among urban mothers; no demographic variable reached significance among rural mothers. This suggests that, in the rural sample, knowledge gaps were relatively uniform across demographic subgroups and are more plausibly explained by limited access to structured health information than by any single demographic characteristic — reinforcing the case for a broadly targeted, easily accessible intervention such as an illustrated booklet rather than a narrowly targeted one. This finding parallels other community studies on child illness knowledge and care-seeking, such as Burra et al. (2019), who found that a large proportion of both rural and urban parents did not seek appropriate medical care for common childhood illnesses, and Kaur and Kajal, who found that maternal knowledge of diarrhoea management was associated with marital and family circumstances rather than a single fixed demographic trait.

Taken together, these findings support the study's underlying premise: that a validated, low-cost information booklet — rather than a resource-intensive one-to-one intervention — is an appropriate and scalable strategy

for improving maternal knowledge of ARI, diarrhoea and malaria, particularly for rural mothers who currently rely heavily on multimedia sources of variable reliability.

CONCLUSION

Urban mothers of under-five children in Navi Mumbai demonstrated significantly better knowledge of common childhood illnesses (ARI, diarrhoea and malaria) than rural mothers, with good knowledge predominating among urban mothers and average-to-poor knowledge

predominating among rural mothers. Knowledge score was significantly associated with occupational status and previous illness-related knowledge among urban mothers only, with no significant demographic association found among rural mothers. These findings confirm a meaningful urban-rural knowledge gap and the consequent need for accessible health education. An illustrated information booklet on the recognition, home management and danger signs of ARI, diarrhoea and malaria was developed and validated by subject experts as a practical, scalable tool to help close this gap, particularly for mothers in rural and low-information-access settings.

Implications for Nursing

Community health nurses are well placed to use the study findings and the resulting booklet to strengthen maternal recognition of danger signs and appropriate home care, to design targeted health education sessions in rural outreach and immunisation clinics, to guide in-service training for newly recruited community health workers, and to inform nursing curricula and further community-based research into caregiver knowledge and health-seeking behaviour.

Limitations

The study was conducted within a limited time frame using a non-probability convenient sample from selected urban and rural areas of Navi Mumbai, which limits generalisability to the wider population; findings were also based entirely on mothers' self-reported responses.

Recommendations

Future research should replicate this comparison on a larger, more representative sample; extend it to assess maternal attitudes and practices in addition to knowledge; evaluate the booklet's effectiveness using a pre-test-post-test design; and explore other modalities, such as video-assisted or structured teaching programmes, for improving maternal knowledge of common childhood illnesses in both urban and rural settings.

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