

A cross-sectional study on knowledge and practice of caregivers of under-5 children regarding EPI

B H Nazma Yasmeen¹, Md. Tahmidul Islam², Akhand Tanzih Sultana³, Saenat Haque⁴, Aysha Noor⁴, Shekufe Zaman⁴, Kanta Chowdhury⁵

¹Professor and Head
Department of General
Paediatrics
Bangladesh Shishu Hospital &
Institute, Dhaka

²Assistant Researcher
Hope Infertility Centre
Dhaka, Bangladesh

³Professor (Current Charge)
Department of General
Paediatrics
Bangladesh Shishu Hospital &
Institute, Dhaka

⁴Resident Medical Officer
Department of General
Paediatrics
Bangladesh Shishu Hospital &
Institute, Dhaka

⁵Assistant Professor
Department of Neonatal
Medicine and NICU
Bangladesh Shishu Hospital &
Institute, Dhaka

Correspondence

Prof. Dr. B H Nazma Yasmeen
Professor and Head
Department of General
Paediatrics
Bangladesh Shishu Hospital &
Institute, Dhaka
e-mail: prof.nazma.yasmeen@
gmail.com

DOI:

<https://doi.org/10.3329/dshj.v41i1.93359>

Received : 12 March 2025

Revised : 27 March 2025

Accepted: 31 March 2025

Volume 41 | Number 1 | June 2025

Abstract

Background: The Expanded Programme on Immunization (EPI) is one of the most successful and cost effective public health interventions for vaccine-preventable diseases of under-5 children in Bangladesh. Complete and timely immunization of under-5 children largely depends upon the knowledge and practice of caregivers' regarding vaccination. Evaluating caregivers' knowledge and practices regarding EPI is necessary to find out the gaps and enhance immunization services.

Objective: To assess the knowledge and practice of caregivers of under-5 children regarding EPI at Bangladesh Shishu Hospital & Institute, Dhaka.

Methods: It was a descriptive cross-sectional study conducted from 8th to 22nd February 2025 among caregivers of under-5 children attending the outpatient department (OPD) and EPI centre of Bangladesh Shishu Hospital and Institute, Dhaka. The knowledge and practice of the caregivers regarding EPI were assessed using 8 questions on knowledge and 5 on practice, assigning a score of 1 for each correct response and 0 for each incorrect response. Purposive sampling technique was used for data collection and the final sample size was 148. The data were analysed via SPSS (version 31.0).

Results: The mean age of the under-5 children was 16.12±12.37 months (mean±SD) and the majority (53.4%) of under-5 children were aged 0-12 months. The study population included 50.7% males and 49.3% females. The majority were Muslim (72.3%) and resided in urban areas (70.3%). More than three-fifths (62.2%) of the caregivers reported health centres as their source of knowledge about EPI. Three-fourths (75%) of the participants had adequate knowledge, while the majority (95.3%) demonstrated good practices regarding EPI.

Conclusion: The results of our study revealed that the majority of the participants had an adequate level of knowledge and demonstrated good practice regarding immunization of under-5 children. The majority first heard about vaccination from health centres and were aware that tuberculosis, measles, rubella, polio, diphtheria, whooping cough, tetanus and hepatitis B can be prevented by vaccine. However, most of the participants lacked knowledge that vaccine can prevent diseases like meningitis and pneumonia also.

Key words: Caregivers, Under-5 children, Expanded Programme on Immunization

Introduction

Immunization is recognized as one of the most successful public health strategies for preventing infectious diseases and reducing under-five mortality worldwide. The World Health Organization's Expanded Programme on Immunization (EPI) aims to ensure that every child receives all recommended vaccines according to the national immunization schedule. Bangladesh introduced the EPI in 1979 and has since achieved high immunization coverage through government commitment and community-based health services.

Several studies conducted in different countries found that most caregivers/mothers had generally good knowledge, positive attitudes, and favorable practices regarding childhood immunization. The majority recognized the importance and protective benefits of vaccines, with high immunization coverage reported, although a considerable proportion of children were either partially immunized or not vaccinated according to the recommended schedule. Important barriers to complete immunization included poor awareness, poverty, illiteracy, distance to healthcare facilities, and misconceptions about vaccine's adverse effects.

Knowledge gaps regarding vaccine-preventable diseases were also evident, while literacy, socioeconomic status, and health workers performances were identified as key factors influencing on immunization acceptance.¹⁻³

Few other studies highlighted that caregivers generally had moderate to good knowledge and positive attitudes toward childhood immunization, although important knowledge gaps remained.^{4,5} One study found that only 53.3% of children were fully immunized, with poor maternal knowledge, time constraints, and forgetfulness being the main barriers to completing the vaccination schedule.⁶ The other study reported significant positive correlations between caregivers' knowledge, attitudes, and practices, with education, employment, and age significantly influencing knowledge levels.⁷ Some studies emphasized the need for continuous caregiver education on immunization schedules, newer vaccines, and vaccine benefits through healthcare workers and mass media to improve vaccination coverage and adherence.⁸⁻¹⁰

Therefore, this study was conducted to assess the knowledge, and practice of caregivers of under-5 children regarding EPI at Bangladesh Shishu Hospital and Institute, Dhaka. This study provided valuable information on existing knowledge and practice and helped to develop targeted educational interventions to improve EPI coverage and child health outcomes.

Materials and Methods

A descriptive cross-sectional study was conducted from 8th to 22nd February 2025 to assess the knowledge and practice of caregivers of under-5 children regarding EPI at OPD and EPI centre of Bangladesh Shishu Hospital and Institute, Dhaka. Purposive sampling technique was used for data collection and the final sample size was 148. The data were analysed via SPSS (version 31.0).

Measurement of caregivers' knowledge and practice regarding EPI

For data collection, a 22-item structured pre-tested questionnaire was used which consisted of 3 parts. The first part consisted of 8 questions on socio-demographic profile and 1 question on source of knowledge about EPI. The second and third sections assessed knowledge (K1 to K8) and practice habits (P1 to P5) regarding immunization of under-5 children, respectively. For each correct response it was scored '1' and for each incorrect response '0.'

The total knowledge score ranged from 0-8. With scores 0 to 3 indicates inadequate knowledge, while scores 4 to 5 and 6 to 8 indicate average and adequate knowledge on immunization, respectively. Regarding practice, the total score ranged from 0-5. With scores 0 to 3 indicates negative response and score 4 to 5 indicates positive response on practice regarding immunization.

Data collection and ethics: After giving verbal informed consent, the participants filled up a questionnaire on knowledge and practice regarding EPI. The Bangladesh Shishu Hospital and Institute Ethical Review Board approved the study.

Results

This study included 148 under-5 children and the mean age of the children was 16.12±12.37 months (mean±SD). The majority (53.4%) of under-5 children were aged 0-12 months, followed by 29.1% aged 13-24 months, 8.1% aged 25-36 months, and 6.7% aged 37-48 months. Only 2.7% of the under-5 children were aged 49-59 months (Table I).

Table I: Distribution of under-5 children according to their age (N=148)

Age (In months)	Frequency (n)	Percentage (%)
0-12	79	53.4
13-24	43	29.1
25-36	12	8.1
37-48	10	6.7
49-59	4	2.7
Mean±SD: 16.12±12.37		

SD=Standard Deviation

In this study half (50.7%) of the under-5 children were male, while other half (49.3%) were female (Figure 1).

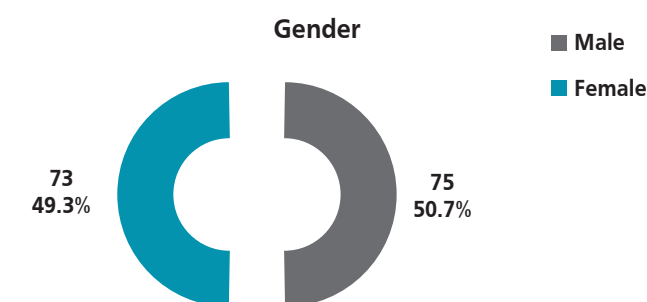


Figure 1: Distribution of under-5 children according to their gender (N=148)

In this study we found that almost three-fourths (72.3%) of the under-5 children were Muslim, while more than one-fifth (21.6%) were Hindu. The remaining 6.1% were Christian (Table II).

Table II: Distribution of under-5 children according to their religion (N=148)

Religion	Frequency (n)	Percentage (%)
Muslim	107	72.3
Hindu	32	21.6
Christian	9	6.1
Buddhist	0	0.0

In our study the majority (70.3%) of the under-5 children resided in urban areas, while more than one-fourth (29.7%) resided in rural areas (Figure 2).

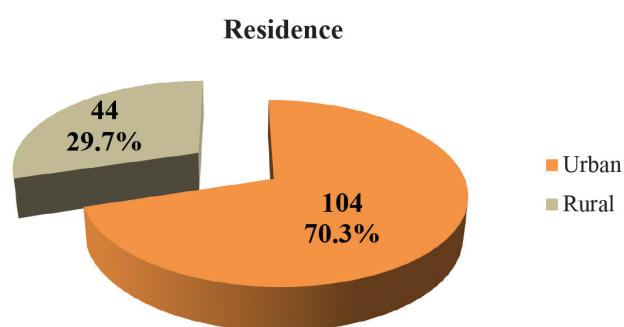


Figure 2: Distribution of under-5 children according to their residence (N=148)

More than half (54.7%) of the children's fathers were graduates, while 22.3% had completed education up to the HSC level. The majority (41.2%) of their mothers were also graduates, followed by 24.3% educated up to the HSC level, 18.2% up to the SSC level, and 10.8% up to the primary level.

Almost two-fifths (38.5%) of the children's fathers were employed in private jobs, while more than one-fourth (27%) were engaged in business. Nearly one-fifth (18.9%) of the children's fathers were employed in government service. The majority (66.2%) of the children's mothers were homemakers, while 21.6% were employed in private jobs (Table III).

Table III: Distribution of under-5 children according to their parent's educational level and occupation (N=148)

Variable	Frequency (n)	Percentage (%)
Father's educational status		
Illiterate	5	3.4
Primary	15	10.1
SSC	14	9.5
HSC	33	22.3
Graduate	81	54.7
Mother's educational status		
Illiterate	8	5.4
Primary	16	10.8
SSC	27	18.2
HSC	36	24.3
Graduate	61	41.2
Father's occupation		
Govt. service	28	18.9
Private job	57	38.5
Business	40	27.0
Others	23	15.6
Mother's occupation		
Homemaker	98	66.2
Govt. service	13	8.8
Private job	32	21.6
Business	2	1.4
Others	3	2.0

The majority (62.2%) of the children's caregivers reported that their source of knowledge about EPI was a health centre followed by Media (16.1%), family (14%) and other (7.7%) (Figure 3).

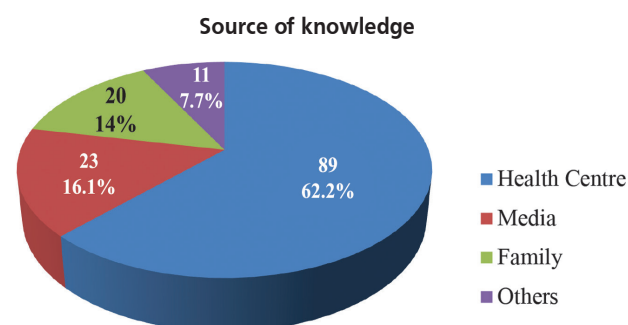


Figure 3: Caregiver's source of knowledge about EPI (N=148)

In our study almost all participants were aware that measles (95.3%), tuberculosis (93.3%), rubella (93.3%), and poliomyelitis (93.3%) can be prevented by vaccination. More than four-fifths (88.5%, 85.8%, and 84.4% respectively) had positive responses i.e. that tetanus, whooping cough, and diphtheria can also be prevented by vaccination (Table IV).

Table IV: Distribution of the participants regarding knowledge about vaccine-preventable diseases (N=148)

Diseases	Yes n (%)	No n (%)	Don't Know n (%)
Tuberculosis	138 (93.3)	3 (2.0)	7 (4.7)
Measles	141 (95.3)	2 (1.4)	5 (3.3)
Mumps	102 (68.9)	21 (14.2)	25 (16.9)
Rubella	138 (93.3)	3 (2.0)	7 (4.7)
Poliomyelitis	138 (93.3)	2 (1.4)	8 (5.3)
Diphtheria	125 (84.4)	10 (6.8)	13 (8.8)
Whooping Cough	127 (85.8)	3 (2.0)	18 (12.2)
Tetanus	131 (88.5)	6 (4.1)	11 (7.4)
Meningitis	72 (48.6)	43 (29.1)	33 (22.3)
Hepatitis B	118 (79.7)	17 (11.5)	13 (8.8)
Diarrhoea	75 (50.7)	49 (33.1)	24 (16.2)
Pneumonia	91 (61.5)	36 (24.3)	21 (14.2)

In this study the majority participants had knowledge that hepatitis B (79.7%) and pneumonia (61.5%) are vaccine-preventable diseases, while only about half (48.6%) knew that meningitis is also a vaccine-preventable disease. Participants' overall knowledge regarding EPI was mostly adequate (Table V).

Table V: Distribution of the participants by their knowledge on EPI (N=148)

Variable	Frequency	Percentage
K1: Do you know about vaccination?		
Yes	143	96.6
No	5	3.4
K2: Vaccination prevents infectious disease:		
Yes	130	87.8
No	0	0.0
Don't know	18	12.2
K3: Some vaccines can cause fever, pain, redness, swelling at vaccination site, rash etc:		
Yes	138	93.2
No	10	6.8
K4: Vaccination starts just after birth:		
Yes	123	83.1
No	9	6.1
Don't know	16	10.8
K5: Vaccination reduces disability (e.g. polio), morbidity and mortality:		
Yes	124	83.8
No	4	2.7
Don't know	20	13.5
K6: Immunization status of your child:		
Completely immunized	90	60.8
Partially immunized	49	33.1
Not immunized	9	6.1
K7: Standard dose of oral polio vaccine:		
1 drop	18	12.2
2 drops	86	58.1
3 drops	0	0.0
Don't know	44	29.7
K8: Which vaccine is given at birth:		
Pentavalent	1	0.6
BCG	123	83.1
Polio	10	6.8
MR vaccine	5	3.4
Don't know	9	6.1

The majority of the participants (89.9% and 93.2%, respectively) ensured that their children received vaccinations on time and recommended about vaccination to others. Almost all participants (95.3% and 95.9%, respectively) took advice from doctors or healthcare workers about any missing dose of vaccination as well as any side effects following vaccination, while 98.6% believed that the vaccines available at health centres were safe (Table VI).

Table VI: Distribution of the participants by their practice on EPI (N=148)

Variable	Yes n (%)	No n (%)
P1: I ensure my child gets all the vaccines time to time	133 (89.9)	15 (10.1)
P2: If any dose of vaccine is missed, I take advice from doctors or healthcare workers about the missed dose	141 (95.3)	7 (4.7)
P3: I recommend about vaccination to others	138 (93.2)	10 (6.8)
P4: If any side effects occur due to vaccination I visit doctor at hospital or health center	142 (95.9)	6 (4.1)
P5: I think that the vaccines available at health centres are safe	146 (98.6)	2 (1.4)

In this study, three-fourths (75.0) of the participants had adequate knowledge, while the majority (95.3%) demonstrated good practices regarding EPI (Figure 4 & 5).

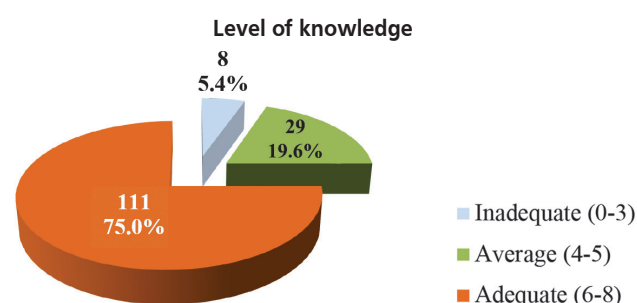


Figure 4: Distribution of participants by their level of knowledge about EPI (N=148)

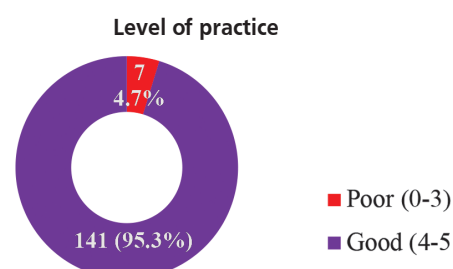


Figure 5: Distribution of participants by their level of practice on EPI (N=148)

Discussion

This descriptive cross-sectional study was conducted at OPD and EPI centre of Bangladesh Shishu Hospital and Institute to assess knowledge and practice of caregivers of under-5 children regarding EPI. Our study revealed that caregivers had adequate knowledge about immunization and the practice regarding immunization of their child was good. Anand et al., Kavuma and Orishaba, and Danso et al. assessed knowledge, attitude, and practice of caregivers of children below five years towards immunization. These studies revealed that

caregivers had the required knowledge, right attitude, and sufficient level of practice towards immunization of their children.¹⁻³

In our study, 50.7% children were male and 49.3% female. 70.3% respondents resided in urban area and the remaining 29.7% resided in rural area. Salih, Abdulwahid, and Kadhim showed that two-thirds children were female and one-third male.⁴ Kavuma and Orishaba showed the opposite where two-thirds children were male and one-third female.² Regarding source of knowledge about immunization, present study showed that the majority (62.2%) of the participants first heard about vaccination from health centres followed by media (16.1%) and family (14%). Anand et al. and Danso et al. also showed similar result regarding source of knowledge.^{1,3} Kavuma and Orishaba showed that the majority (60%) of the respondents had heard about immunization from friends.²

Almost all participants were aware that measles (95.3%), tuberculosis (93.3%), rubella (93.3%), and poliomyelitis (93.3%) can be prevented by vaccination. More than four-fifths (88.5%, 85.8%, and 84.4% respectively) were positive that tetanus, whooping cough, and diphtheria can also be prevented by vaccination. The majority had knowledge that hepatitis B (79.7%) and pneumonia (61.5%) are vaccine-preventable diseases, while only about half (48.6%) knew that meningitis is also a vaccine-preventable disease. In the study conducted by Danso et al. (2023), the majority of the participants were aware that vaccination could prevent Poliomyelitis, Measles, and Tetanus. However, approximately half of these respondents did not know that diphtheria (57.5%), whooping cough (52.5%), and hepatitis B (40%) were vaccine-preventable diseases.³

The study was conducted only at a single centre, so it may not reflect the picture of the entire country. Due to short study period, the sample size was very small. So, more studies should be conducted on childhood immunization.

Conclusion

The findings of this study showed that parents had adequate level of knowledge and demonstrated a good level of practice regarding immunization of their child. The majority of the parents were aware about the diseases that can be prevented if vaccines are administered on time. As the study was conducted at a single centre only, more studies should be conducted regarding immunization of under-5 children.

Conflict of interest: None

References

1. Anand A, Vardhan A, Sinha A, Baibhav S, Kumari A, Raushan K, Kumar A, Anushree A, Chattopadhyay N, Pal R. Knowledge, attitude and practice of the caregivers regarding immunization in under-5 children in rural Bihar, India. *Journal of Family Medicine and Primary Care*. 2025 Jul 21;14(7):2752. doi: 10.4103/jfmpc.jfmpc_1850_24
2. Kavuma S, Orishaba G. Knowledge, attitude, and practices of caregivers of children below five years towards immunization at Ndejje Health Centre IV, Wakiso District: a cross-sectional study. *SJ-Pediatrics*. 2024;1(5):14. <https://doi.org/10.51168/nt7cej90>
3. Danso SE, Frimpong A, Seneadza NA, Ofori MF. Knowledge, attitudes, and practices of caregivers on childhood immunization in Okaikoi sub-metro of Accra, Ghana. *Frontiers in public health*. 2023 Sep 15;11:12304. DOI 10.3389/fpubh.2023.1230492
4. Salih SM, Abdulwahid HS, Kadhim KA. Knowledge, attitude and practices among caregivers of children under five years about routine immunization. *Official Journal of Pakistan Medical Association, Rawalpindi-Islamabad Branch* 2025 Jan;50(1):167.
5. Qidwai W, Ali SS, Ayub S, Ayub S. Knowledge, attitude and practice regarding immunization among family practice patients. *Journal of the Dow University of Health Sciences (JDUHS)*. 2007 Apr 10;1(1):15-19.
6. Imteyaz A, Pal R, Akram M, Ahmad M, Shah H. Correlates of the immunization status of children in an urban slum of Delhi. *Annals of Tropical Medicine and Public Health*. 2008 Jul 1;1(2):59. DOI: 10.4103/1755-6783.50686
7. Gali A, Krishna KN, Khan S, Lowry J, Mangum T, Mohammadnezhad M. Knowledge and practice of care-givers who have under-five diarrhoeal children: a quantitative cross-sectional study in Mataniko settlements in Honiara, Solomon Islands, 2016. *Global Health Journal*. 2017 Sep 1;1(2):12-22. [https://doi.org/10.1016/S2414-6447\(19\)30077-6](https://doi.org/10.1016/S2414-6447(19)30077-6)
8. Workie HM, Sharifabdilahi AS, Addis EM. Mothers' knowledge, attitude and practice towards the prevention and home-based management of diarrheal disease among under-five children in Diredawa, Eastern Ethiopia, 2016: a cross-sectional study. *BMC pediatrics*. 2018 Nov 19;18(1):358. <https://link.springer.com/content/pdf/10.1186/s12887-018-1321-6.pdf>
9. Rahman A, Reza AA, Bhuiyan BA, Alam N, Dasgupta SK, Mostari S, Anwar I. Equity and determinants of routine child immunisation programme among tribal and non-tribal populations in rural Tangail subdistrict, Bangladesh: a cohort study. *BMJ open*. 2018 Oct;8(10):e022634. <http://dx.doi.org/10.1136/bmjopen-2018-022634>
10. Jamil K, Bhuiya A, Streatfield K, Chakrabarty N. The immunization programme in Bangladesh: impressive gains in coverage, but gaps remain. *Health policy and planning*. 1999 Jan 1;14(1):49-58. <http://dx.doi.org/10.1136/bmjopen-2018-022634>