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Original Research Article

Assessment of the knowledge and perceptions of auxiliary nurse midwives regarding the U-WIN app in urban health and wellness centers in selected areas of Delhi

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ABSTRACT

Background: Digital health interventions have become integral to strengthening immunization systems in India. The Universal Immunization WIN (U-WIN) application was introduced to digitize routine immunization services under the Universal Immunization Programme. The successful implementation of U-WIN largely depends on the knowledge, perception, and acceptance of frontline health workers, particularly auxiliary nurse midwives (ANMs), who are directly involved in immunization service delivery. This study aimed to assess the knowledge and perception of ANMs regarding the U-WIN application in urban health and wellness centres (UHWCs) of selected areas of Delhi.
Methods: A quantitative, descriptive cross-sectional study was conducted among 110 ANMs working in UHWCs of Central and North-East Delhi. Non-probability purposive sampling was used. Data were collected using a structured knowledge questionnaire, a perception rating scale, and a barrier checklist. Descriptive statistics summarized the findings, while Fisher's Exact Test and Karl Pearson's correlation coefficient were applied to assess associations between variables.
Results: The mean knowledge score of ANMs was 17.85±2.96, with 74.6% demonstrating good knowledge of the U-WIN application. The mean perception score was 49.38±5.06, indicating an overall favorable perception, with 59.1% of participants showing a favorable attitude. Usability and interface-related issues were the most reported barriers, followed by technical and connectivity challenges. A statistically significant association was observed between years of professional experience and both knowledge ($p=0.010$) and perception ($p=0.019$). Knowledge and perception were positively correlated ($p<0.001$).
Conclusions: The study concludes that ANMs possess good knowledge and favorable perceptions regarding the U-WIN application. Addressing usability and technical challenges can further enhance effective utilization and strengthen routine immunization services.

Keywords: Auxiliary nurse midwives, Digital health, Urban health and wellness centres, U-WIN application

INTRODUCTION

Digital transformation has emerged as a critical driver for strengthening health systems worldwide, particularly in low- and middle-income countries where gaps in service delivery, data management, and accessibility remain persistent. The rapid expansion of digital technologies has enabled governments to redesign healthcare delivery models by leveraging information and communication technologies to improve efficiency, transparency, and equity in health services.[1] In India, digital health has been positioned as a strategic priority to address long-standing challenges related to population size, geographic diversity, and resource constraints.

The Government of India launched the Digital India initiative in July 2015 with the vision of transforming the country into a digitally empowered society and knowledge economy.[1,2] This initiative emphasized strengthening digital infrastructure, ensuring universal digital literacy, and delivering governance and services electronically. Healthcare emerged as a major beneficiary of this initiative, with several digital health interventions introduced to improve service delivery, record-keeping, and decision-making at all levels of care. By enabling real-time data capture and interoperability across health programs, digital platforms have become essential tools for achieving universal health coverage and improving population health outcomes.

One of the most critical public health programs in India is the Universal Immunization Programme (UIP), which was introduced in 1985 and remains one of the largest immunization programs in the world. Under UIP, children receive vaccines against 12 vaccine-preventable diseases, while pregnant women are provided tetanus and diphtheria vaccination to reduce maternal and neonatal mortality.[3] Immunization has been consistently recognized as one of the most cost-effective public health interventions, preventing an estimated 2-3 million deaths globally each year.[4] In India, sustained immunization efforts have contributed to a significant decline in under-five mortality, from 45 per 1,000 live births in 2014 to 32 per 1,000 live births in 2020.[5]

Despite notable progress, immunization coverage gaps persist, particularly in urban slums, migrant populations, and underserved communities. A substantial number of children continue to remain unvaccinated or partially vaccinated due to factors such as population mobility, weak tracking systems, missed follow-up doses, and documentation challenges.[6] According to global estimates, approximately 1.44 million children in India were classified as "zero-dose" in 2023, meaning they had not received even the first dose of the diphtheria-tetanus-pertussis (DTP) vaccine during their first year of life.[6,7] These gaps highlight the need for robust beneficiary tracking systems capable of identifying left-out and dropout children in real time.

To address logistical and data-related challenges in immunization delivery, India has increasingly adopted digital solutions. The Electronic Vaccine Intelligence Network (e-VIN) was introduced to strengthen vaccine supply chain management by monitoring stock levels and cold chain temperatures across health facilities.[8] Subsequently, during the COVID-19 pandemic, the Co-WIN platform was developed as a comprehensive digital backbone for vaccination delivery, enabling beneficiary registration, appointment scheduling, real-time coverage monitoring, and digital certification at an unprecedented scale.[8] The success of Co-WIN demonstrated the feasibility and effectiveness of digital platforms in managing large-scale immunization programs.

Building on these successes, the Ministry of Health and Family Welfare introduced the Universal Immunization WIN (U-WIN) application, a dedicated digital platform designed to fully digitize routine immunization services under UIP.[6,8-10] The U-WIN app was piloted in 65 districts across India in January 2023 and subsequently rolled out nationwide in November 2024.[9,10] Positioned as the third pillar of India's digital immunization ecosystem, U-WIN integrates beneficiary registration, vaccination tracking, reporting, and digital certification into a single interoperable platform aligned with the Ayushman Bharat Digital Mission (ABDM).[3,10]

The U-WIN platform enables name-based tracking of every child and pregnant woman eligible for routine immunization, thereby facilitating timely vaccination and reducing the risk of missed doses. Key features of the application include real-time data entry, automated SMS reminders, QR-code–based electronic vaccination certificates, and integration with the Ayushman Bharat Health Account (ABHA) for unique beneficiary identification.[3] By triangulating data from e-VIN (vaccine supply), U-WIN (coverage), and ABHA (beneficiary identity), the platform aims to ensure accurate reporting, minimize vaccine wastage, and enhance accountability within the immunization system.[10]

The effective functioning of digital health platforms such as U-WIN is heavily dependent on the engagement and performance of frontline healthcare workers, particularly Auxiliary Nurse Midwives (ANMs). ANMs are the primary providers of maternal and child health services at the community level and are directly responsible for immunization service delivery, beneficiary registration, and follow-up.[11,12] As frontline workers, ANMs act as the interface between health systems and communities, making their knowledge, attitudes, and acceptance of digital tools critical determinants of program success.

Evidence from previous research suggests that the adoption of mobile health (mHealth) technologies by frontline health workers can improve coordination, data accuracy, and service outreach.[13,14] However, studies also indicate that the introduction of digital tools may increase workload, create parallel reporting systems, and pose challenges related to usability, connectivity, and digital literacy.[13,15,16] Health workers' perceptions of technology whether they view it as supportive or burdensome-significantly influence sustained use and data quality.

Several studies conducted in India and other low-resource settings have reported mixed acceptance of mHealth applications among frontline workers, including ANMs.[15,17,18] While some health workers perceive digital tools as enhancing efficiency and professional competence, others report challenges such as poor internet connectivity, device malfunction, inadequate training, and lack of technical support.[15-17,19]

This study aimed to assess the Knowledge and Perceptions of Auxiliary Nurse Midwives (ANMs) regarding the U-WIN app in Urban Health and Wellness Centers (UHWCs) in Selected Areas of Delhi.

METHODS

Study design and research approach

The present study adopted a quantitative research approach grounded in the positivist paradigm, which emphasizes objectivity, measurement, and statistical analysis to generate empirical evidence. Quantitative methods are particularly appropriate when the objective is to assess levels of knowledge, perception, and associated factors in a defined population using structured instruments.[20,21]

A descriptive cross-sectional research design was employed to assess the knowledge and perception of Auxiliary Nurse Midwives (ANMs) regarding the U-WIN application and to identify perceived barriers to its use at a single point in time. Cross-sectional designs are widely used in public health research to describe characteristics, attitudes, and practices within a population without manipulating variables.[20,22] This design was considered suitable for capturing the existing status of digital health adoption among ANMs following the national rollout of the U-WIN platform.

Study setting

The study was conducted in Urban Health and Wellness Centres (UHWCs) located in the Central and North-East districts of Delhi, India. UHWCs function as primary healthcare delivery units under the Ayushman Bharat initiative and provide comprehensive services including maternal and child health care, immunization, and non-communicable disease screening. These centers serve densely populated urban communities, making them critical settings for evaluating digital immunization interventions such as the U-WIN application.

The selection of the setting was based on feasibility, accessibility of participants, administrative approval, and the relevance of UHWCs in implementing routine immunization services through digital platforms.

Study population

The target population comprised Auxiliary Nurse Midwives (ANMs) currently working in Urban Health and Wellness Centers in Delhi. ANMs are frontline healthcare providers responsible for delivering maternal and child health services, maintaining immunisation records, and ensuring beneficiary follow-up. Their role places them at the center of U-WIN implementation, making them an appropriate population for this study.

Sample size and sampling technique

A total of 110 ANMs were included in the study. The sample size was determined using Slovin's formula, considering the accessible population of ANMs in the selected districts and ensuring adequate representation for descriptive and inferential analysis.

A non-probability purposive sampling technique was used to select participants who met the predefined inclusion criteria. Purposive sampling is commonly used in exploratory and descriptive studies where participants are selected based on their relevance to the research question and experience with the phenomenon under study.[23]

Inclusion criteria

Inclusion criteria were the ANMs currently working in Urban Health and Wellness Centers of Central and North-East Delhi, ANMs using the U-WIN application for at least six months, and ANMs willing to participate and provided written informed consent.

Exclusion criteria

Exclusion criteria were the ANMs on long leave during the data collection period, ANMs unavailable at the time of data collection, and ANMs who never used the U-WIN application.

Data collection instruments

Data were collected using three structured tools developed by the investigator after an extensive review of relevant literature and national program guidelines.

Tool I: Structured knowledge questionnaire

Tool-I consists of two sections, A & B.

Section A: Socio-demographic profile of ANMs.

Section B: A structured questionnaire consisting of 22 items was used to assess ANMs' knowledge regarding the U-WIN application. The questionnaire included multiple-choice and dichotomous (yes/no) items covering: Basic information and purpose of the U-WIN app, Beneficiary eligibility and registration, Technical features and device usage, Data entry, management, and error correction, and Vaccination status updates and reporting.

Each correct response was awarded one mark, while incorrect responses received zero marks. The total possible score ranged from 0 to 22, with higher scores indicating better knowledge.

Tool II: Perception rating scale

A 5-point Likert scale consisting of 13 items was used to assess ANMs' perceptions regarding the U-WIN application. The items measured perceptions related to: Impact on service delivery and job performance, Usability and interface experience, and Training adequacy and preparedness.

Responses ranged from "strongly disagree" to "strongly agree." Both positively and negatively worded items were included, with reverse scoring applied where appropriate. Total scores ranged from 13 to 65, with higher scores reflecting more favorable perceptions.

Tool III: Structured barrier checklist

A structured checklist comprising 18 items was used to identify perceived barriers faced by ANMs while using the U-WIN application. The items were categorized into: Technical and connectivity challenges, Usability and interface issues, and Training and capacity gaps.

Barriers were ranked based on frequency of reporting to identify the most, moderately, and least reported challenges.

Data collection procedure

After obtaining ethical clearance from the Institutional Ethics Committee of Jamia Hamdard and administrative permission ref no. 12/25(11/11/2025) from the Directorate of Health Services, Delhi, data collection was carried out between 22 October and 14 November 2025.

Participants were approached at their respective UHWCs, and the purpose of the study was explained. Written informed consent was obtained prior to data collection. Questionnaires were administered using a paper-and-pencil method through face-to-face interaction. Each participant required approximately 10–15 minutes to complete the tools. Confidentiality and anonymity were strictly maintained.

Ethical considerations

Ethical principles outlined in the Declaration of Helsinki were adhered to throughout the study.[24] Participation was voluntary, and participants were informed of their right to withdraw at any stage without penalty. Personal identifiers were not collected, and data were used solely for research purposes.

Data analysis

Data were entered into Microsoft Excel to create a master data sheet and analyzed using both descriptive and inferential statistics, with descriptive measures including frequency, percentage, mean, median, and standard deviation used to summarize demographic variables, knowledge levels, perception scores, and perceived barriers, while inferential analysis using Fisher's Exact Test was applied to determine associations between knowledge and perception scores and selected demographic variables, and statistical significance was set at $p<0.05$.

RESULTS

The present study assessed the knowledge, perception, and perceived barriers regarding the U-WIN application among 110 Auxiliary Nurse Midwives (ANMs) working in Urban Health and Wellness Centers (UHWCs) of Central and North-East Delhi. The findings are presented according to the study objectives using descriptive and inferential statistics (Table 1).

Table 1: Frequency and percentage distribution of socio-demographic characteristics of ANMs (n=110).

Socio-demographic variables	Frequency (f)	Percentage (%)
Age (in years)		
Below 25	0	0
25-34	31	28.2
35-44	42	38.2
45above	37	33.6
Professional qualification		
ANM	94	85.5
GNM	6	5.4
B.Sc. Nursing	10	9.1
Years of experience in year		
Less than 1	2	1.8
1-5	15	13.6
6-10	16	14.5
More than 10	77	70
Ease in using electronic devices		
Yes	110	100
No	0	0

A total of 110 ANMs participated in the study. Most participants were in the age group of 35-44 years (38.2%), followed by 45 years and above (33.6%), while 28.2% were between 25-34 years. None of the participants were below 25 years of age. Regarding professional qualification, 85.5% of participants were trained as Auxiliary Nurse Midwives, while 9.1% held a Bachelor of Science in Nursing degree and 5.4% were General Nursing and Midwifery (GNM) graduates. In terms of work experience, a substantial proportion of ANMs (70.0%) had more than 10 years of professional experience, indicating a highly experienced workforce. All participants (100%) reported ease in using electronic devices such as smartphones or tablets.

Nearly all ANMs (99.1%) had received training before using the U-WIN application, and 88.2% reported receiving additional training during its use. The majority

(93.6%) used the U-WIN application daily, and 50.9% reported spending 21-28 hours per week on the application. These findings reflect high exposure and routine utilization of the digital platform (Table 2).

Table 2: Frequency and percentage distribution of socio-demographic characteristics of ANMs (n=110).

Socio-demographic Variables	Frequency (f)	Percentage (%)
Training received before using the U-WIN app		
Yes	109	99.1
No	1	0.9
Training received while using the U-WIN app		
Yes	97	88.2
No	13	11.8
Frequency of use of the U-WIN app		
Daily	103	93.6
Weekly	2	1.8
Twice a week	4	3.7
Occasionally	1	0.9
Average time taken for data entry of one beneficiary in the U-WIN app (minutes)		
Less than 1	11	10
1-2	44	40
3-5	38	34.5
More than 5	17	15.5
Weekly hours spent on U-WIN app (hours)		
Less than 21	44	40
21-28	56	50.9
29-42	9	8.2
More than 42	1	0.9

The knowledge scores ranged from 9 to 22, with a possible maximum score of 22. The mean knowledge score was 17.85±2.96, indicating an overall good level of knowledge among participants. Based on predefined scoring criteria, 74.6% of ANMs demonstrated good knowledge regarding the U-WIN application, 22.7% had moderate knowledge, and only 2.7% exhibited poor knowledge. High knowledge levels were particularly evident in areas related to beneficiary registration, vaccination status updates, and routine data entry processes (Table 3).

Table 3: Distribution of level of knowledge of ANMs rregarding the U-WIN app (n=110).

Level of knowledge	Score range	Frequency (f)	Percentage (%)
Poor	0-10	3	2.70
Moderate	11-16	25	22.70
Good	17-22	82	74.60
Mean±SD	9-22	17.85±2.96	

Perception scores ranged from 38 to 60, with a total possible score of 65. The mean perception score was 49.38±5.06, indicating an overall favorable perception toward the U-WIN application.

More than half of the participants (59.1%) demonstrated a favorable perception, while 40.9% exhibited a moderately favorable perception. None of the participants fell into the unfavorable perception category. ANMs largely agreed that the U-WIN application improved immunization tracking, enhanced record accuracy, and supported service delivery. However, neutral responses were observed for items related to application speed and interface complexity (Table 4).

Table 4: Distribution of perception of ANMs regarding the U-WIN app (n=110).

Level of perception	Score range	Frequency (f)	Percentage (%)
Unfavorable perception (<50%)	13-32	0	0
Moderately favorable perception (50-75%)	33-48	45	40.9
Favorable perception (>75%)	49-65	65	59.1
Mean±SD	38-60	49.38±5.06	

Perceived barriers in using the U-WIN application

The analysis of perceived barriers revealed variability across different domains. The overall barrier score ranged from 6 to 18, with a mean score of 11.72±2.34. Among the three categories of barriers: Usability and interface issues ranked highest (modified mean =0.71), followed by technical and connectivity challenges (modified mean =0.67), while training and capacity gaps were least reported (modified mean = 0.24).

Frequently reported usability barriers included application lag, difficulty navigating multiple screens, and challenges in correcting data entry errors. Technical barriers primarily involved poor internet connectivity and delayed synchronization of data. Training-related barriers were minimal, reflecting adequate orientation and support for most ANMs.

Fisher's Exact Test was applied to examine associations between knowledge levels and selected demographic variables. A statistically significant association was found between years of professional experience and knowledge regarding the U-WIN application (p=0.010). ANMs with more than 10 years of experience were more likely to demonstrate good knowledge. No statistically significant association was observed between knowledge level and age, professional qualification, or frequency of U-WIN app usage (Table 5).

Table 5: Association between knowledge and selected socio-demographic variables (n=110).

Selected variable	Poor knowledge	Moderate knowledge	Good knowledge	Fisher's exact test	P value
Age (in years)					
Below 25	0	0	0	2.202	0.76
25-34	1	8	22		
35-44	2	8	32		
45 above	0	9	28		
Professional qualification					
ANM	3	24	67	4.156	0.361
GNM	0	1	5		
B.Sc. Nursing	0	0	10		
Years of experience in year					
Less than 1	0	2	0	15.039	0.010*
1-5	1	2	12		
6-10	1	7	8		
More than 10	1	14	62		
Ease in using electronic devices					
Yes	3	25	82	NA	NA
No	0	0	0		
Training received before using the U-WIN app					
Yes	3	25	81	2.307	1
No	0	0	1		

*Significant - p value <0.05

Table 6: Association between perception and selected socio-demographic variables (n=110).

Selected variable	Unfavorable perception	Moderately favorable perception	Favorable perception	Fisher's exact test	P value
Age (in years)					
Below 25	0	0	0	0.815	0.691
25-34	0	14	17		
35-44	0	15	27		
45 above	0	16	21		
Professional qualification					
ANM	0	41	53	2.118	0.292
GNM	0	2	4		
B.Sc. Nursing	0	2	8		
Years of experience in year					
Less than 1	0	2	0	8.803	0.019*
1-5	0	5	10		
6-10	0	11	5		
More than 10	0	27	50		
Ease in using electronic devices					
Yes	0	45	65	NA	NA
No	0	0	0		
Training received before using the U-WIN app					
Yes	0	44	65	1.801	0.18
No	0	0	1		

*Significant - p value <0.05

A significant association was observed between years of experience and perception regarding the U-WIN application (p=0.019). ANMs with longer professional experience exhibited more favorable perceptions toward the application. Other demographic variables, including age and educational qualification, did not show a statistically significant association with perception scores (Table 6).

Fisher's Exact Test demonstrated a significant association between knowledge and perception regarding the U-WIN application (p<0.05). Additionally, Karl Pearson's

correlation coefficient revealed a positive correlation between knowledge and perception scores, indicating that ANMs with higher knowledge levels tended to have more favorable perceptions toward the application (Table 7).

Table 7: Association and correlation between knowledge and perception (n=110).

Selected variable	Poor knowledge	Moderate knowledge	Good knowledge	Fisher's Exact test	r-value	P value
Level of perception of ANMs						
Moderately favorable perception	3	18	24	18.927	0.413	0.001*
Favorable perception	0	7	58			

*Significant - p value <0.05

DISCUSSION

The present study reveals that most participants 82 (74.6%) demonstrated good knowledge regarding the U-WIN app, followed by 25 (22.7%) participants who had moderate knowledge, only a very small proportion, 3 (2.7%), exhibited poor knowledge. Based on the ANMs' knowledge scores regarding the U-WIN app, the mean score of 17.85 and median score of 19, along with a standard deviation of 2.959, indicate relatively low variability among the respondents. The findings of the present study were consistent with mixed-method study conducted by Charanthimath et al to explore the experiences of community health workers (CHWs) with the PIERS on the Move (POM) mHealth application, which was implemented during the CLIP Trial in Karnataka, India. Their study reported that CHWs were able to effectively understand and utilize the mobile application for maternal health assessment, demonstrating high levels of familiarity, comfort, and operational knowledge with mHealth tools. The similarity between the two studies indicates that when provided with appropriate training and a user-friendly technological interface, community-level health workers including ANMs and CHWs can readily acquire strong knowledge of digital health applications. The high proportion of ANMs with good knowledge (74.6%) in the present study further reinforces the broader evidence supporting the feasibility and acceptability of integrating mHealth systems into routine public health service delivery.[25]

More than half of subjects 65 (59.1%), exhibited a favorable perception of the U-WIN application, followed by 45 (40.9%) of subjects demonstrated a moderately favorable perception regarding the U-WIN app, whereas none of the participants (0%) had a unfavorable perception of the U-WIN app. Based on perception of ANM regarding the U-WIN app with the mean score was 49.38 and a median of 50; the scores had a standard deviation of 5.063 reflects relatively moderate variability among respondents. These findings are consistent with the previous qualitative research conducted by Monika et al which aimed to explore the perceptions of ANMs towards the Mother Child Tracking System in civil dispensaries. Their study similarly reported positive perceptions among ANMs, who viewed the digital system as beneficial for improving accuracy, record maintenance, and service delivery efficiency. The study suggests that ANMs tend to demonstrate favourable perceptions toward digital health interventions when they perceive them as enhancing workflow, reducing manual documentation, and improving continuity of care. This congruence reinforces the broader understanding that well-designed mHealth and e-tracking systems are likely to be accepted and effectively utilized by community-level health workers.[18]

Similarly, the study by Gandhi et al assessed the knowledge, attitude, and practice (KAP) regarding mobile-phone-based telemedicine among a broader group of community health workers, including ANMs, MPHWs, and ASHAs. Their findings indicated a median readiness score of 109, showing generally good readiness for telemedicine adoption. This study also discusses where ANMs showed favorable perception levels, Gandhi et al found that ASHAs demonstrated the most favourable attitude toward mobile-phone-based telemedicine services.[17]

The present study reveals that the most frequently reported category of barriers faced by ANMs in using the U-WIN app was usability and interface issues, followed by technical and connectivity challenges and the least reported barrier category was training and capacity gaps. Consistent to this study, Kodali PB and Das S conducted a mixed-method study in Andhra Pradesh to assess the acceptance of mHealth technologies among 272 Auxiliary Nurse Midwives. Their study similarly reported that ANMs faced significant challenges related to technical issues, poor network connectivity, and interface difficulties, which impeded smooth usage of mHealth applications. Both studies highlight that despite growing familiarity and positive attitudes towards digital health tools, frontline workers continue to encounter structural and design-related barriers. This consistency elaborates the need for improved system optimization, stable digital infrastructure, and iterative user-centered design to enhance the overall usability of mHealth platforms in public health settings.[15]

Similarly, the qualitative study conducted by Kachimanga et al in Malawi revealed a broader range of factors influencing the use of the YendaNafe mHealth application among CHWs. They emphasized that usability and interface issues, structured training, ongoing

supervision, and performance feedback were crucial facilitators for successful adoption of the application.[16]

There was a significant association between knowledge and years of experience (p=0.010) at the p<0.05 level of significance. This suggests that years of experience influence the knowledge levels of ANMs regarding the U-WIN app. There was no significant association found between knowledge and other background variables such as age, professional qualification, training received before using the app, training received while using the app, frequency of use, average time taken for data entry, and weekly hours spent on the app. Consistent with this study, Odendaal WA et al carried out a meta-analysis proposed a meticulous view about mHealth programs. The review included 43 studies, primarily from low- and middle-income countries. The review emphasized that the successful adoption and effective utilization of mHealth applications are strongly influenced by cumulative exposure, contextual experience, and routine engagement with digital systems. The congruence between the present study and the meta-analysis reinforces that practical experience serves as a stronger determinant of digital competency than standalone training sessions or demographic characteristics.[13]

There was a significant association between perception and years of experience (p=0.019) at the p<0.05 level of significance. This suggests that years of experience influence the perception levels of ANMs regarding the U-WIN app. There was no significant association was found between perception and other selected background variables such as age, professional qualification, ease in using electronic devices, training received before using the U-WIN app, training received while using the U-WIN app, frequency of app use, average data entry time, and weekly hours spent on the app. Similarly, consistent to present study, Kaphle et al conducted formative research with 15 community health workers (CHWs) in rural Bihar, India, to assess how the adoption of an mHealth application Comcare impacts the quality and experience of maternal and newborn care delivery. Their study showed that CHWs with greater prior experience in community health work and repeated exposure to digital tools developed more positive perceptions regarding usability, relevance, and supportive value of the application. The similarity between the findings of this study suggests that practical experience serves as a key determinant in shaping health workers' perceptions toward mHealth innovations.[16]

This study had some limitations. Although the estimated sample size was 135, only 110 ANMs could be included due to time constraints and the inaccessibility of some Health and Wellness Centres following a terrorist attack in Delhi. The study was restricted to selected Urban Health and Wellness Centres in the Central and North-East districts of Delhi, which may limit the generalizability of the findings. Additionally, the use of self-reported data may have introduced reporting bias. Data collection was also challenging because the ANMs were frequently occupied with their routine healthcare responsibilities and training activities.

CONCLUSION

The present study provides valuable insights into the knowledge, perception, and perceived barriers related to the use of the U-WIN application among Auxiliary Nurse Midwives (ANMs) working in Urban Health and Wellness Centers of Delhi. The findings indicate that the majority of ANMs possess good knowledge and demonstrate a favorable perception toward the U-WIN app, reflecting successful initial training efforts and widespread adoption following its national rollout.

Overall, while the U-WIN application has been positively received and effectively integrated into routine immunization services, addressing system-level and usability challenges is critical to fully realizing its potential in strengthening immunization coverage and reducing zero-dose and dropout cases.

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