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Research Article

Effect of an Educational Intervention Using Checklist on Nurses' Knowledge, Attitude, and Self-Efficacy When Disclosing to Children with HIV in Southwestern Uganda

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Abstract

Background: Disclosure of HIV status to children with perinatal HIV is an important component of comprehensive HIV care. However, many nurses experience challenges related to knowledge, confidence, and communication skills required to support caregivers during the disclosure process. Objective: The objective of this study was to evaluate the effect of an educational intervention utilizing a pediatric HIV disclosure checklist on nurses' knowledge, attitudes, and self-efficacy regarding HIV status disclosure to children living with perinatally acquired HIV. Methods: A pre-experimental one-group pretest–posttest design study was conducted among 20 nurses working in HIV care at a district hospital in Southwestern Uganda. Participants were recruited through consecutive sampling and completed a structured self-administered questionnaire before and after the intervention. The intervention consisted of an educational session, coaching, and introduction of a pediatric HIV disclosure checklist. Data were analyzed using paired-samples t-tests and Wilcoxon signed-rank tests to compare pre-intervention and post-intervention scores. Results: The findings demonstrated statistically significant improvements in nurses' knowledge, attitudes, and self-efficacy regarding pediatric HIV status disclosure following the educational intervention. Mean knowledge scores increased from 50% before the intervention to 67% after the intervention ($p = 0.001$). Attitude scores improved from a mean of 2.51 to 2.89 ($p = 0.002$). Self-efficacy scores increased from 2.55 to 2.93 ($p = 0.002$). Nurses demonstrated improved understanding of disclosure timing, age-appropriate information sharing, caregiver support, and use of disclosure guidelines. Conclusion: The educational intervention and disclosure checklist significantly improved nurses' preparedness to participate in pediatric HIV disclosure. Integrating disclosure checklists into routine HIV care may strengthen nurses' ability to support caregivers and improve disclosure practices.

Keywords

Pediatric HIV Disclosure, Perinatal HIV, Nurses, Self-efficacy, Disclosure Checklist

1. Introduction

Pediatric HIV disclosure refers to informing children living with HIV about their HIV status in a developmentally appropriate manner [26, 31-33, 37-39]. Disclosure is recognized as a critical component of HIV care because it promotes treatment adherence, psychological adjustment, retention in care, and improved health outcomes [1, 3, 17, 20, 43]. Despite international

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recommendations supporting age-appropriate disclosure, many children with perinatal HIV remain unaware of their HIV status [6, 28, 36]. In Uganda and other sub-Saharan African countries, studies report that a substantial proportion of children living with HIV have not yet been informed of their diagnosis [7, 13, 35]. This remains a major public health concern despite progress in prevention of mother-to-child transmission [13, 29, 47].

Nurses play an essential role in supporting caregivers during the disclosure process, including counseling, assessing readiness, and providing psychosocial support [5, 10, 11, 40, 41]. However, studies indicate that many nurses feel inadequately prepared due to lack of training, absence of structured tools, and low confidence [10, 11, 34]. Bandura's Self-Efficacy Theory guided this study [7, 8, 48], suggesting that individuals are more likely to perform a behavior when they believe they are capable of doing so successfully. Educational interventions that incorporate mentorship, feedback, and practice can strengthen self-efficacy and improve performance [9, 12, 15, 48]. The purpose of this study was to evaluate the effect of an educational intervention using a disclosure checklist on nurses' knowledge, attitudes, and self-efficacy regarding disclosure among children with perinatal HIV.

1.1. Background

Disclosure of HIV status to children living with perinatally acquired HIV is a critical component of comprehensive HIV care. Disclosure refers to the process of revealing or informing a child about their HIV-positive status in a developmentally appropriate manner. Rather than being a single event, disclosure is a gradual process that requires continuous communication between healthcare providers, caregivers, and the child. Nurses play a vital role in supporting families throughout this process by respecting caregivers' needs, expectations, and concerns while ensuring that disclosure occurs in a timely and supportive manner. The World Health Organization (WHO) recommends that children aged 6–12 years should be informed of their HIV status and that full disclosure should be completed by 12 years of age using a compassionate and age-appropriate approach [10, 11].

The epidemiology of pediatric HIV has changed substantially since the early years of the HIV epidemic. Advances in antiretroviral therapy (ART) have significantly improved survival among children living with perinatal HIV, allowing many to reach adolescence and adulthood. Consequently, HIV status disclosure has emerged as one of the major psychosocial challenges faced by caregivers and healthcare providers [41]. During the early stages of the epidemic, disclosure received limited attention because survival rates among HIV-infected children were low. However, increasing survival prompted the development of disclosure guidelines [48].

Sub-Saharan Africa (SSA) remains disproportionately affected by pediatric HIV. According to Khangale et al. [20, 22], approximately 85% of new pediatric HIV infections occur in SSA, where more than 1.7 million children are living with HIV. Despite international recommendations, disclosure rates remain low, with studies indicating that only 13%–60% of children with perinatal HIV are aware of their HIV-positive status [21, 22]. Uganda continues to carry a substantial burden of pediatric HIV, with an estimated 150,000 children aged 0–14 years living with the disease [29]. Approximately 43,000 children under the age of 15 are receiving ART. In Southwestern Uganda, a study reported that only 31% of children with perinatal HIV had been informed of their HIV status [30], highlighting persistent gaps in disclosure practices.

Healthcare providers, particularly nurses, play a central role in facilitating pediatric HIV disclosure. However, studies have identified significant barriers that limit nurses' ability to effectively support the disclosure process. Research conducted in Barbados reported inadequate knowledge among nurses regarding pediatric HIV disclosure, negative attitudes toward disclosure, and practices that adversely affected the quality of pediatric HIV care [18]. Limited knowledge and the absence of standardized disclosure guidelines have been associated with reduced confidence among nurses, leading to inconsistent disclosure practices that rely heavily on individual experience rather than evidence-based approaches [22, 26, 27].

The disclosure process is often emotionally challenging for both caregivers and healthcare providers. Many caregivers fear that informing a child about their HIV-positive status may cause psychological distress because HIV is commonly perceived as a serious and potentially life-threatening illness [34]. Consequently, disclosure is frequently delayed or avoided altogether. Studies have shown that many nurses worldwide remain uncertain about how to conduct pediatric HIV disclosure effectively [20, 22]. Delayed or absent disclosure may negatively affect children's understanding of their illness, treatment adherence, and engagement in HIV care services [42, 50].

Despite improvements in prevention programs, disclosure rates remain low [12, 35]. Nurses are central to the disclosure process but face challenges including lack of training, limited guidelines, and emotional discomfort [4, 10, 11, 34, 40]. These barriers contribute to delayed disclosure and inconsistent practices [22, 23, 30]. Educational interventions and structured tools such as disclosure checklists have been recommended to improve provider competence and confidence [14, 15, 24, 28]. However, evidence on their effectiveness in Uganda remains limited [24, 35].

Several interventions have been implemented to strengthen healthcare providers' capacity to support pediatric HIV disclosure. However, evidence from Tanzania indicates that many HIV training programs are not standardized and provide limited information on disclosure among children with perinatal HIV. Furthermore, the content and duration of these training programs vary considerably, resulting in inconsistent knowledge and practices among healthcare providers [19]. Inadequate training may therefore reduce nurses' confidence and ability to initiate or support disclosure effectively. Innovative strategies have been developed to improve disclosure

practices in clinical settings. A study conducted in Namibia reported the successful integration of a disclosure monitoring form into children's HIV care records. The form enabled nurses to assess the child's readiness for disclosure, monitor disclosure progress over time, and ensure continuity of disclosure-related discussions across clinic visits [9]. The study demonstrated that the use of structured disclosure assessment tools enhanced nurses' ability to facilitate the disclosure process systematically. Building on this evidence, the present study utilized a pediatric HIV disclosure checklist as an educational intervention to strengthen nurses' knowledge, attitudes, and self-efficacy regarding disclosure among children living with perinatal HIV.

Advances in antiretroviral therapy (ART) have significantly improved survival among children living with HIV [18, 27, 29]. Consequently, disclosure of HIV status has become increasingly important in long-term HIV care (46). Disclosure has been associated with improved adherence to ART, better psychosocial adjustment, and improved understanding of health responsibilities among children [1, 3, 17, 20, 42, 46]. However, delayed or non-disclosure remains common in many settings [6, 23, 36]. In Uganda, an estimated 160,000 children live with HIV, primarily due to mother-to-child transmission [13, 20-22, 25, 46].

1.2. Theoretical Framework

This study was guided by Bandura's Social Cognitive Theory and Self-Efficacy Theory [7, 8, 48]. Self-efficacy refers to an individual's belief in their ability to perform a specific task successfully. Higher self-efficacy increases motivation and likelihood of behavior execution [48]. Bandura identified four sources of self-efficacy: performance accomplishment, vicarious experience, verbal persuasion, and emotional states [8, 48]. These principles have been widely applied in nursing and behavioral interventions [48]. In this study, the intervention incorporated all four components using training, mentorship, role modeling, and emotional support, alongside a structured disclosure checklist [15].

1.3. Operationalization of Bandura's Self-Efficacy Theory

Bandura's Self-Efficacy Theory guided the design of the educational intervention and the evaluation of its outcomes. The theory proposes that self-efficacy is influenced by four primary sources: performance accomplishment, vicarious learning, verbal persuasion, and emotional states. These constructs were operationalized within the intervention to strengthen nurses' confidence and competence in pediatric HIV disclosure. Performance accomplishment was addressed through reflection and practical use of the checklist. Vicarious learning occurred through demonstrations and peer learning. Verbal persuasion was provided through coaching and feedback. Emotional states were addressed through discussion of fears and concerns related to disclosure [15, 48]. Self-efficacy was measured using pre- and post-intervention questionnaires that assessed nurses' confidence in supporting caregivers, communicating HIV-related information to children, and facilitating the disclosure process. Improvements in knowledge, attitudes, and self-efficacy following the intervention were considered indicators of successful application of the theoretical framework.

2. Methodology

2.1. Study Design

A pre-experimental one-group pretest–posttest design study was conducted to evaluate the effect of an educational intervention on nurses' knowledge, attitudes, and self-efficacy regarding pediatric HIV disclosure. A quasi-experimental design was selected because random assignment was not feasible within the clinical setting and the study sought to determine the effect of an intervention on outcomes measured before and after implementation [25, 44, 45, 50].

2.2. Study Setting

The study was conducted at a district hospital in Southwestern Uganda that provides HIV care services to children living with perinatal HIV. The hospital was purposively selected because it serves approximately 160 children aged 6–12 years receiving HIV care and employs nurses directly involved in pediatric HIV management and disclosure-related activities.

2.3. Study Population and Sampling

The study population comprised nurses involved in the care of children living with perinatal HIV at the selected district hospital. Consecutive sampling was used to recruit participants because all eligible nurses available during the study period were invited to participate [4]. Twenty nurses met the eligibility criteria and were enrolled in the study.

2.4. Inclusion Criteria

All nurses involved in the management and care of children with perinatal HIV at the study site were eligible to participate.

2.5. Educational Intervention

The intervention was guided by Bandura's Self-Efficacy Theory and consisted of a structured educational program on pediatric HIV disclosure and the use of a pediatric HIV disclosure checklist. During training sessions, participants received instruction on disclosure principles, disclosure stages, age-appropriate communication strategies, and application of the disclosure checklist. Interactive teaching methods, including case

discussions, demonstrations, role modelling, and guided practice, were used to enhance learning. Following the training, participants applied the checklist while supporting disclosure activities among children attending the pediatric HIV clinic. Progress in checklist utilization was monitored during follow-up visits on every Thursday for over a four-week period.

2.6. Data Collection

Data were collected using a structured self-administered questionnaire before and after the intervention developed from published literature on pediatric HIV disclosure [44, 45]. The questionnaire assessed demographic characteristics, knowledge, attitudes, and self-efficacy related to pediatric HIV disclosure [44, 45]. Pre-intervention data were collected before implementation of the educational program, while post-intervention data were collected after participants had applied the disclosure checklist in clinical practice. Unique identification codes were used to match pretest and posttest responses while maintaining participant anonymity.

2.7. Study Instrument

The study instrument was prepared by the researcher based on standard tools. The researcher used a self-administered questionnaire because it was cost-effective, minimized the risk of interviewer bias influencing participants, and reduced the number of incomplete responses from nurses who were concerned about receiving negative feedback on sensitive topics.

The questionnaire consisted of four sections:

1) *Demographic characteristics* (age, sex, education level, years of experience, and prior disclosure training);
2) *Knowledge of pediatric HIV disclosure* (10 items);
3) *Attitudes toward pediatric HIV disclosure* (10 items measured using a Likert scale);
4) *Self-efficacy regarding pediatric HIV disclosure* (10 items measured using a Likert scale).

Knowledge scores were calculated as percentages and categorized as low (<50%), fair (50–69%), good (70–79%), and high (≥80%). Attitude and self-efficacy scores were computed as mean scores, with higher scores indicating more positive attitudes and greater confidence.

2.8. Reliability and Validity

Demographic characteristics (age, sex, education level, years of experience, prior disclosure training): The study ensured reliability by using standardized pre-coded response options, and by training data collectors on consistent recording and administration procedures.

Knowledge of pediatric HIV disclosure (10 items): The study ensured reliability by developing objective items with clear scoring criteria and conducting reliability testing after pilot testing the questionnaire.

Attitudes toward pediatric HIV disclosure (10 Likert-scale items): The study ensured reliability by using a consistent Likert-scale format with well-constructed items and assessing internal consistency reliability during pilot testing.

Self-efficacy regarding pediatric HIV disclosure (10 Likert-scale items): The study ensured reliability by using clear, directly measurable self-efficacy statements aligned with disclosure tasks and evaluating internal consistency reliability through pilot testing.

Content validity was established through an extensive literature review and expert review by specialists in pediatric HIV care and disclosure. Feedback from experts was incorporated into the final instrument before data collection.

A pilot study was conducted among ten nurses from a comparable health facility that was not included in the main study. Minor revisions were made to improve clarity and instructions. Internal consistency reliability was assessed using Cronbach's alpha, which yielded a coefficient of 0.81, indicating good reliability.

2.9. Data Analysis

Data were entered, coded, and verified, and any entry errors were minimized through double data entry by two personnel. IBM SPSS Statistics version 24 was used for analysis. For demographic variables, descriptive statistics were reported using frequencies and percentages for age, gender, years of experience, and prior HIV disclosure training, including when the training occurred. For knowledge, each participant's total score was calculated as a percentage and categorized; mean percentages and category distributions were also computed. Pre-test and post-test responses were further examined at the level of individual items by determining the proportion of correct and incorrect answers to identify areas of strength and weakness. The effectiveness of the intervention on knowledge was evaluated using a paired t-test with statistical significance set at $p<0.05$. For attitudes, overall scores were computed using mean values and categories, and item-level responses were assessed to determine whether participants demonstrated positive or negative attitudes; negatively worded items were reverse-scored. Changes in attitude from pre-test to post-test were analyzed using the Wilcoxon signed-rank test at $p<0.05p$. Similarly, self-efficacy scores were calculated using mean values and categorized; negatively worded items were reverse-scored, and items were reviewed to distinguish high versus moderate/low confidence. The intervention's effect on self-efficacy was assessed using the Wilcoxon signed-rank test with $p<0.05p < 0.05p<0.05$.

2.10. Ethical Considerations

Ethical approval was obtained from the Uganda Christian University Research Ethics Committee and administrative permission was obtained from the study hospital before data collection. Written informed consent was obtained from all participants before enrollment [49].

Confidentiality was maintained through the use of participant identification codes rather than names [2]. Completed questionnaires and consent forms were stored securely and accessible only to the research team. Participation was voluntary, and participants were informed of their right to withdraw from the study at any time without penalty.

3. Results

3.1. Participant Characteristics

Most participants were female, aged 20–29 years, and had fewer than five years of experience in pediatric HIV care. The majority reported having no prior training in pediatric HIV disclosure.

Table 1. Demographic Characteristics of Participants (N = 20).

Characteristic	Frequency (n)	Percentage (%)
Sex		
Female	13	65.0
Male	7	35.0
Age Group (Years)		
20–29	10	50.0
30–39	6	30.0
≥40	4	20.0
Years of Experience in Pediatric HIV Care		
<5 years	12	60.0
5–10 years	5	25.0
>10 years	3	15.0
Previous Training in Pediatric HIV Disclosure		
Yes	2	10.0
No	18	90.0

The majority of participants were female (65%), aged 20–29 years (50%), and had less than five years of experience in pediatric HIV care (60%). Most participants (90%) had never received formal training in pediatric HIV disclosure.

3.2. Effect of Educational Intervention on Knowledge

Table 2. Comparison of Knowledge Scores Before and After the Intervention (N = 20).

Variable	Pretest Mean (%)	Posttest Mean (%)	Mean Difference	p-value
Knowledge Score	50.0	67.0	17.0	0.001*

Statistically significant at $p < 0.05$.
Knowledge scores increased significantly following the intervention. The mean score improved from 50% at baseline to 67% after the intervention ($p = 0.001$), indicating enhanced understanding of pediatric HIV disclosure principles.

3.3. Changes in Knowledge Categories

Table 3. Knowledge Levels Before and After the Intervention (N = 20).

Knowledge Category	Pretest n (%)	Posttest n (%)
Low Knowledge	9 (45.0)	0 (0.0)
Moderate Knowledge	8 (40.0)	14 (70.0)
High Knowledge	3 (15.0)	6 (30.0)

The proportion of nurses classified as having low knowledge decreased from 45% before the intervention to 0% afterward. The proportion with high knowledge increased from 15% to 30%.

3.4. Effect of Educational Intervention on Attitudes

Table 4. Comparison of Attitude Scores Before and After the Intervention (N = 20).

Variable	Pretest Mean	Posttest Mean	Mean Difference	p-value
Attitude Score	2.51	2.89	0.38	0.002

Wilcoxon signed-rank test; statistically significant at $p < 0.05$.
Attitude scores improved significantly following the intervention. Participants expressed stronger agreement that nurses should actively support caregivers during pediatric HIV disclosure.

3.5. Effect of Educational Intervention on Self-Efficacy

Table 5. Comparison of Self-Efficacy Scores Before and After the Intervention (N = 20).

Variable	Pretest Mean	Posttest Mean	Mean Difference	p-value
Self-Efficacy Score	2.55	2.93	0.38	0.002

Wilcoxon signed-rank test; statistically significant at $p < 0.05$.
The intervention significantly improved self-efficacy among nurses. Participants reported greater confidence in guiding caregivers, responding to children's questions, and facilitating disclosure discussions.

3.6. Self-Efficacy Categories

Table 6. Self-Efficacy Levels Before and After the Intervention (N = 20).

Self-Efficacy Category	Pretest n (%)	Posttest n (%)
Low	10 (50.0)	3 (15.0)
Moderate	10 (50.0)	14 (70.0)
High	0 (0.0)	3 (15.0)

Following the intervention, the proportion of nurses with high self-efficacy increased from 0% to 15%, while those with low self-efficacy decreased substantially.

4. Discussion

The findings indicate that an educational intervention supported by a disclosure checklist can significantly improve nurses' knowledge, attitudes, and self-efficacy regarding pediatric HIV disclosure. These findings are consistent with previous studies conducted in Malawi, South Africa, Ghana, and Uganda that identified training and standardized disclosure tools as critical factors influencing healthcare providers' participation in disclosure activities [10, 11, 24, 26].

Improved knowledge following the intervention suggests that structured educational approaches can address information gaps regarding disclosure timing, procedures, and age-appropriate communication [10, 24]. Enhanced attitudes indicate greater acceptance of disclosure as an ongoing process rather than a single event [11, 12]. The significant increase in self-efficacy demonstrates the importance of coaching, mentorship, and practical experience in strengthening nurses' confidence [15, 16, 35, 36].

4.1. Demographics

The majority of participants in this study were aged 20–29 years, indicating a relatively young nursing workforce. This finding suggests that many of the nurses were early in their professional careers and had limited experience in pediatric HIV disclosure, as most reported fewer than five years of work experience in this area. Similar demographic patterns have been reported in studies conducted in private and district-level healthcare facilities, where younger nurses constitute a substantial proportion of the workforce. Female nurses comprised the majority of participants, reflecting the gender distribution commonly observed within the nursing profession in district hospitals and other healthcare settings. This finding is consistent with national and regional trends, where nursing remains a predominantly female profession.

A notable finding of this study was that most participants reported having received no prior training in pediatric HIV disclosure. The lack of formal training may have contributed to deficiencies in knowledge, negative attitudes, and reduced confidence regarding the disclosure process. Adequate training is essential for equipping nurses with the competencies required to support children and caregivers throughout HIV status disclosure. The findings are consistent with those reported by Madiba and Diko (2021) in rural healthcare settings in South Africa, where the majority of healthcare providers had not received formal education on pediatric HIV disclosure, and several had never participated in the disclosure process. The authors further reported that healthcare providers' confidence in conducting disclosure was negatively affected by inadequate knowledge and limited practical skills. These findings underscore the importance of structured educational interventions aimed at improving healthcare providers' competence and confidence in pediatric HIV disclosure.

Regarding educational qualifications, most participants held a diploma in nursing. This level of training may have contributed to a relatively stronger knowledge base compared with nurses holding certificate-level qualifications. Similar findings were reported by Huq et al. (2019) in Barbados, where higher educational attainment among nurses was associated with greater knowledge and improved competence in pediatric HIV care. The association between educational level and knowledge highlights the importance of continuous professional development and specialized training programs to strengthen nurses' capacity to support pediatric HIV disclosure effectively.

4.2. Effect of the Intervention on Knowledge

Knowledge scores improved significantly following the intervention. The mean knowledge score increased from 50% before the intervention to 67% after the intervention ($p = 0.001$). Nurses demonstrated improved understanding of the appropriate age for disclosure, disclosure processes, and age-specific information sharing. Similar improvements have been reported following structured disclosure training interventions among healthcare providers [10, 24, 26]. The findings of this study demonstrated a significant improvement in nurses' knowledge regarding pediatric HIV disclosure following the educational intervention that incorporated a disclosure checklist.

The confidence interval further supports the effectiveness of the intervention in enhancing participants' knowledge and understanding of the disclosure process. Prior to the intervention, many nurses lacked essential knowledge regarding key aspects of pediatric HIV disclosure, including the appropriate age to initiate disclosure among children living with perinatally acquired HIV. Participants identified the absence of standardized disclosure tools and inadequate training as major barriers to effective disclosure, findings that are consistent with studies conducted in South Africa and Malawi, where lack of disclosure guidelines and insufficient training were reported as significant challenges to disclosure practice [21, 26, 27]. Following the intervention, all participants correctly identified pediatric HIV disclosure as informing a child of their HIV-positive status, and more than half recognized the importance of disclosure-specific guidelines and protocols in facilitating the process.

Nurses also demonstrated improved understanding of when to initiate disclosure, the type of information appropriate for different developmental stages, and how to support caregivers using the disclosure checklist. These findings suggest that the disclosure checklist served as an effective educational and clinical support tool, providing structure and consistency to the disclosure process. Similar results have been reported in studies conducted in Washington, D.C., which highlighted the value of standardized disclosure tools in strengthening healthcare providers' knowledge and disclosure practices [14].

Overall, the intervention enhanced nurses' capacity to conduct pediatric HIV disclosure in a sensitive, age-appropriate, and supportive manner.

4.3. Effect of the Intervention on Attitudes

Attitude scores improved significantly from a mean of 2.51 before the intervention to 2.89 after the intervention ($p = 0.002$). Participants increasingly viewed disclosure as a gradual process requiring preparation, caregiver involvement, and ongoing support, findings consistent with previous studies [11, 12]. The educational intervention incorporating a pediatric HIV disclosure checklist significantly improved nurses' attitudes toward pediatric HIV disclosure. The increase in post-intervention attitude scores and confidence interval findings suggest that the intervention had a positive effect on participants' perceptions and readiness to support disclosure. Before the intervention, many nurses reported inadequate training and viewed disclosure primarily as the caregiver's responsibility. Following the intervention, all participants recognized the important role of nurses in facilitating pediatric HIV disclosure, consistent with findings from Malawi, where most healthcare providers acknowledged the importance of informing children of their HIV status [21].

Nurses also demonstrated a greater understanding of caregivers' fears regarding children's negative reactions to disclosure and acknowledged the need for professional support during the process. Furthermore, participants recognized that disclosure is not a one-time event but a gradual, age-appropriate process requiring preparation and ongoing communication. The disclosure checklist appeared to reinforce this understanding by providing a structured framework for disclosure. These findings are consistent with the provider-assisted disclosure model developed in Uganda's Masaka region, which emphasizes preparation, readiness assessment, disclosure, and post-disclosure follow-up [20]. Overall, the intervention positively influenced nurses' attitudes and strengthened their commitment to supporting pediatric HIV disclosure.

4.4. Effect of the Intervention on Self-Efficacy

Self-efficacy improved significantly following the intervention. Mean self-efficacy scores increased from 2.55 before the intervention to 2.93 after the intervention ($p = 0.002$). Nurses reported increased confidence in guiding caregivers, addressing children's emotional needs, and communicating HIV-related information appropriately. This finding supports Bandura's theory that educational experiences, feedback, and practical application strengthen confidence and performance [15, 16]. The educational intervention incorporating a pediatric HIV disclosure checklist significantly improved nurses' self-efficacy regarding HIV status disclosure among children living with perinatally acquired HIV. The increase in post-intervention self-efficacy scores and confidence interval findings indicate that the intervention had a positive effect on nurses' confidence and perceived ability to conduct disclosure. Improved self-efficacy is likely to enhance nurses' engagement in the disclosure process and may contribute to increased rates of disclosure among children, enabling them to participate more actively in their care. Following the intervention, participants reported greater confidence in addressing children's emotional needs during disclosure, providing ongoing post-disclosure support, and tailoring disclosure discussions to the child's developmental stage. These findings are consistent with studies from Malawi, which demonstrated that comprehensive training and standardized disclosure tools enhanced healthcare providers' confidence and capacity to support children and caregivers throughout the disclosure process [21].

Furthermore, participants reported increased confidence in explaining HIV and its implications in an age-appropriate manner, addressing cultural and religious concerns, and preparing both caregivers and children for disclosure conversations. These findings support previous evidence from Malawi indicating that collaboration between nurses and caregivers is essential for effective pediatric HIV disclosure [20, 21]. Overall, the intervention strengthened nurses' competence and confidence in facilitating pediatric HIV disclosure.

5. Limitations

Study Limitations

This study had several limitations. First, data were collected using self-reported questionnaires, which may have introduced response and social desirability bias, particularly given the sensitive nature of pediatric HIV disclosure. Second, the small sample size may have limited the statistical power, precision, and generalizability of the findings. Finally, some participants missed scheduled intervention sessions and received the training separately. Although the content and delivery methods were standardized, minor variations in intervention exposure may have influenced participants' outcomes.

6. Conclusion

The educational intervention and pediatric HIV disclosure checklist significantly improved nurses' knowledge, attitudes, and self-efficacy regarding disclosure among children with perinatal HIV. Healthcare facilities should consider incorporating disclosure checklists, mentorship, and continuous professional education into pediatric HIV services to improve disclosure practices and support better outcomes for children living with HIV.

7. Recommendations

To strengthen the quality of care provided to children living with HIV, nurses managing pediatric HIV clients should have improved access to continuous training on pediatric HIV care,

with particular emphasis on the disclosure process. Effective involvement of nurses in disclosure requires comprehensive preparation in disclosure procedures, communication skills, and child-centered counseling approaches.

The findings of this study further suggest that coaching and mentoring, in addition to formal training, can significantly enhance nurses' understanding and practical competence, especially when combined with hands-on demonstrations and supportive supervision. Strengthening nurses' role in pediatric HIV disclosure should be prioritized, with emphasis on empowering them to take an active role rather than relying solely on physicians, counselors, or pediatricians.

At the policy level, the MOH should develop standardized tools and training materials to support pediatric HIV disclosure, including a national disclosure framework that incorporates age-specific guidance in line with WHO recommendations. Such tools would help address persistent uncertainty among nurses regarding the appropriate age for initiating disclosure and promote consistent practice across health facilities. Healthcare institutions should establish clear policies and guidelines to standardize pediatric HIV disclosure practices, ensuring consistency in implementation. Routine monitoring and evaluation of disclosure practices should be conducted to identify gaps, improve performance, and provide continuous feedback to healthcare providers.

Abbreviations

ART	Antiretroviral Therapy
HIV	Human Immunodeficiency Virus
SPSS	Statistical Package for the Social Sciences
SSA	Sub-Saharan Africa
WHO	World Health Organization

Conflicts of Interest

The authors declare that they have no conflicts of interest.

References

[1] Abegaz, B. F., Walle, T. A., Ambaye, A. W., & Tilahun, D. (2018). HIV positive status disclosure and associated factor among HIV infected children in pediatric ART clinics in Gondar town public health facilities, North West Ethiopia. *Journal of Infection and Public Health, 12*(6): 873-877. https://doi.org/10.1016/j.jiph.2019.05.018

[2] Adarmouch, L., Felaefel, M., Wachbroit, R., Felaefel, M., Wachbroit, R., & Silverman, H. (2020). Perspectives regarding privacy in clinical research among research professionals from the Arab region: An exploratory qualitative study. *Biomed Central Medical Ethics, 21*(27). https://doi.org/10.1186/s12910-020-0456-9

[3] Amankwah-Poku, M., Klutsey, D.A., & Asante, K.O. (2021). Disclosure and health-related outcomes among children living with HIV and their caregivers. *AIDS Research Therapy, 18(13).* https://doi.org/10.1186/s12981-021-00337-z

[4] Appiah, S. C. Y., Ivanova, O., Hoelscher, M., Kroidl, I., & Dapaah, J. M. (2021). Disclosure of HIV/AIDS status to infected children in Ghana-A north-south comparison of barriers and enablers. *Children and Youth Services Review, 122*; 105753, https://doi.org/10.1016/j.childyouth.2020.105753

[5] Bajaria, S., Exavery, A., Toroka, N., Barankena, A., Charles, J., & Kikoyo, L. (2020). Factors associated with HIV status disclosure to orphans and vulnerable children living with HIV: Results from a longitudinal study in Tanzania. *AIDS Research and Treatment*, vol. 2020, Article ID 6663596, 10 pages. https://doi.org/10.1155/2020/6663596

[6] Bandura, A. (1977). Social learning theory. Englewood Cliffs, NJ: Prentice Hall.

[7] *Bandura, A. (1986). Social foundations of thought and action: A Social Cognitive Theory. Englewood Cliffs, NJ: Prentice Hall.*

[8] Beebwa, E., Muzoora, C., Ashaba, S., Groves, S., & Atwine, F. (2021). Knowledge, attitude, and preferred strategies towards HIV/AIDS prevention among children attending secondary schools in Southwestern Uganda. *African Health Sciences*, *21*(3), 1067-1073. https://dx.doi.org/10.4314/ahs.v21i3.14

[9] Beima-Sofie, K., Wagner, A.D., Soi, C., Liu, W., Tollefson, D., Njuguna, I. N., Ogutu, E., Gaitho, D., Mburu, N., Oluoch, G., Mwaura, P., Cherutich, P., Oyiengo, L., John-stewart, G. C., Nduati, R., Sherr, K., & Gimbel, S. (2022). Providing "a beam of light to see the gaps": Determinants of implementation of the systems analysis and improvement approach applied to the pediatric and adolescent HIV cascade in Kenya. *Implementation Science Communications, 3*(73). https://doi.org/10.1186/s43058-022-00304-3

[10] Budhwani, H., Mills, L., Marefka, L. E. B., Eady, S., Nghiem, V. T., & Simpson, T. (2020). Preliminary study on HIV status disclosure to perinatal infected children: Retrospective analysis of administrative records from a pediatric HIV clinic in the Southern United States. *BioMed Central Research Notes*, *13*(253). https://doi.org/10.1186/s13104-020-05097-z

[11] Bulali, R. E., Kibusi, S. M., & Mpondo, B. C. T. (2018). Factors associated with HIV status disclosure and its effect on treatment adherence and quality of life among children 6–17 years on antiretroviral therapy in Southern highlands zone, Tanzania: Unmatched case control study. *International Journal of Pediatrics*, vol. 2018, Article ID 8058291, 10 pages. https://doi.org/10.1155/2018/8058291

[12] Centers for Disease Control and Prevention. (2022). Uganda significantly reduces rates of mother-to-child transmission of HIV with CDC support. https://www.cdc.gov/globalhivtb/who-we-are/success-stories/success-story-pages/ugandap-mtct.html#:~:text=The%20UNAIDS%202021%20Spectrum%20estimates,treatment%20during%20pregnancy%20and%20breastfeeding

[13] Doat, A-R., Negarandeh, R., & Hasanpour, M. (2019). Disclosure of HIV status to children in Sub-Saharan Africa: A systematic review. *Medicina*, *55*(8): 433. https://doi.org/10.3390/medicina55080433

[14] Elizabeth Glaser Pediatric AIDS Foundation. Disclosure of Pediatric and Adolescent HIV Status Toolkit. Washington, DC: Elizabeth Glaser Pediatric AIDS Foundation, 2018.

[15] Finnegan, A., Langhaug, L., Schenk, K., Puffer, E.S., Rusakaniko, S., Choi, Y., Mahaso, S., & Green, E. P. (2019). The prevalence and process of pediatric HIV disclosure: A population-based prospective cohort study in Zimbabwe. *PLOS ONE, 14*(5): e0215659. https://doi.org/10.1371/journal.pone.0215659

[16] Guta, A., Areri, H. A., Anteab, K., Abera, L., & Umer, A. (2020). HIV-positive status disclosure and associated factors among children in public health facilities in Dire Dawa, Eastern Ethiopia: A cross-sectional study. *PLoS ONE, 15*(10): e0239767. https://doi.org/10.1371/journal.pone.0239767

[17] Hamed T. (2021). Data collection methods and tools for research: A step-by-step guide to choose data collection technique for academic and business research projects. *International Journal of Academic Research in Management (IJARM), 10*(1), pp.10-38. ffhal-03741847

[18] Huq, E. K., Moriyama, M., Harris, E. E., Shirin, H., & Rahman, M. M. (2019). Evaluation of nurses' knowledge and attitude toward HIV-infected patients in Barbados. *Journal of the International Association of Providers of AIDS Care, 18.* https://doi.org/10.1177/2325958219880592

[19] Ismail, N., Matillya, N., Ratansi, R., & Mbekenga, C. (2021). Barriers to timely disclosure of HIV serostatus: A qualitative study at care and treatment centers in Dar es Salaam, Tanzania. *PLoS ONE, 16*(8): e0256537. https://doi.org/10.1371/journal.pone.0256537

[20] Kairania, R., Onyango-Ouma, W., Ondicho, T.G., Kagaayi, J., & Kigozi, G. (2023). '*Mummy told me that I have HIV, that is the only thing she told me':* Experiences of HIV status disclosure to children in Masaka Region, Uganda. *PLoS ONE, 18*(5): e0285990. https://doi.org/10.1371/journal.pone.0285990

[21] Kalembo, F.W., Kendall, G.E., Ali, M., & Chimwaza, A. F. (2018). Nurses' perspectives and practices regarding the disclosure of HIV status to children in Malawi: A cross-sectional study. *BioMed Central of Health Services Research, 18* (540). https://doi.org/10.1186/s12913-018-3354-9

[22] Khangale, H. M. M., Raliphaswa, N. S., & Tshililo, A. R. (2022). HIV Status disclosure to adolescents who are perinatally infected in Rustenburg Sub District Northwest province. *Children*, *9*(12): 1989. https://doi.org/10.3390/children9121989

[23] Koay, W. L. A., Zhang, J., Manepalli, K. V., Griffith, C. J., Castel, A. D, Scott, R. K., Ferrer, K. T., & Rakhmanina, N. Y. (2021). Prevention of perinatal hiv transmission in an area of high HIV prevalence in the United States. *Journal of Pediatrics; 228: 101*-109. https://doi.org/10.1016/j.jpeds.2020.09.041

[24] Lemma, T., Silesh, M., Taye, B.T., Desta, K., Kitaw, T. M., & Tekalign, T. (2020). HIV serostatus disclosure and its predictors among children living with HIV in Ethiopia: A systematic review and meta-analysis. *Front Public Health*, *10*(859469). https://doi.org/10.3389/fpubh.2022.859469

[25] Mabaso, M., Maseko, G., Sewpaul, R., Naidoo, I., Jooste, S., Takatshana, S., Reddy, T., Zuma, K., & Zungu, N. (2021). Trends and correlates of HIV prevalence among children in South Africa: Evidence from the 2008, 2012 and 2017 South African national HIV prevalence, incidence and behaviour surveys. *AIDS Research and Therapy, 18*(97). https://doi.org/10.1186/s12981-021-00422-3

[26] Madiba, S., & Diko, C. (2020). The consequences of delaying telling children with perinatal HIV about their diagnosis as perceived by nurses in the Eastern Cape: A qualitative study. *Children*, *7*(12), 289. https://doi.org/10.3390/children7120289

[27] Madiba, S., & Diko, C. (2021). Telling children with perinatal HIV about their HIV serostatus: Nurses' practices and barriers to disclosing in a South African rural health district. *Journal of Primary Care & Community Health*, *12.* https://doi.org/10.1177/2150132720984757

[28] Mutambo, C., & Hlongwana, K. (2019). Nurses' perspectives on the barriers to providing HIV services to children in Sub-Saharan Africa. *AIDS Research and Treatment*. Article ID 8056382, 10 pages. https://doi.org/10.1155/2019/8056382

[29] Nabunya, P., Byansi, W., Sensoy, B. O., McKay, M., Ssewamala, F. M., & Damulira, C. (2020). Factors associated with HIV disclosure and HIV-related stigma among children living with HIV in Southwestern Uganda. *Psychiatry, 11*(772). https://doi.org/10.3389/fpsyt.2020.00772

[30] Namukwaya, S., Paparini, S., Seeley, J., & Bernays, S. (2017). "How do we start? And how will they react?" disclosing to young people with perinatally acquired HIV in Uganda. Front Public Health; 5: 343. https://doi.org/10.3389/fpubh.2017.00343

[31] Ngeno, B., Waruru, A., Inwani, I., Nganga, L., Wangari, E. N., Katana, A., Gichangi, A., Mwangi, A., Mukui, I., & Rutherford, G. W. (2019). Disclosure and clinical outcomes among young adolescents living with HIV in Kenya. *The Journal of Adolescent Health, 64*(2), 242–249. https://doi.org/10.1016/j.jadohealth.2018.08.013

[32] Njom Nlend, A. E. (2022). Mother-to-child transmission of HIV through breastfeeding improving awareness and education: A short narrative review. *International Journal of Women's Health, 14: 697*-703. https://doi.org/10.2147/IJWH.S330715

[33] Nwanja, E., Nwaokoro, P., Akpan, U., & Toyo, O. (2023). Improved access to HIV diagnosis and linkage to antiretroviral therapy among children in Southern Nigeria: A before-after study. *BioMed Central Pediatrics, 23*(253). https://doi.org/10.1186/s12887-023-04050-w

[34] Okechukwu, A. A., Kwaghe, V., & Dike, A. U. (2018). Health care providers' perception and practice of HIV disclosure to sero-positive children and adolescents in a tertiary health facility in Abuja, Nigeria. *Journal of Clinical Research in HIV AIDS and Prevention,* https://doi.org/10.14302/issn.2324-7339.jcrhap-18-2202

[35] Paintsil, E., Kyriachildes, T.C., Antwi, S., Renner, L., Nichols, J. S., Amissah, K., Kusah, J. T., Alhassan, A., Ofori, I. P., Catlin, A. C., Gan, G., Lartey, M., & Reynolds, N. R.(2020). Clinic-based pediatric disclosure intervention trial improves pediatric HIV status. disclosure in Ghana. *Journal of Acquired Immune Deficiency Syndrome*, *84*(1): 122-131. https://doi.org/10.1097/QAI.0000000000002316

[36] Peterson, S. J., & Bredow, T. S. (2017). *Middle Range Theories: Application to Nursing Research* (5th ed.). Philadelphia: Wolter's Kluwer health/Lippincott Williams & Wilkins.

[37] Polit, D., & Beck, C. (2019). *Resource manual for nursing research: Generating and assessing evidence for nursing practice*. Lippincott Williams & Wilkins.

[38] Shallo, S. A., & Tassew, M. (2020). HIV positive status disclosure and its associated factors among children on antiretroviral therapy in West Shoa Zone, Western Ethiopia. A mixed method cross-sectional study. *Journal of Multi-disciplinary HealthCare*, *13*: 507-517. https://doi.org/10.2147/JMDH.S258851

[39] Sibiude, J., Le Chenadec, J., Mandelbrot, L., Hoctin, A., Dollfus, C., Faye, A., Bui, E., Pannier, E., Ghosn, J., Garrait, V., Avettand-Fenoel, V., Frange, P., Warszawski, J., & Tubiana, R. (2023). Update of perinatal human immunodeficiency virus type 1 transmission in France: Zero transmission for 5482 mothers on continuous antiretroviral therapy from conception and with undetectable viral load at delivery. *Clinical Infectious Disease*, *76*(3): e590-e598. https://doi.org/10.1093/cid/ciac703

[40] Staples, D. S., Hulland, J. S., & Higgins, C. A. (1998). A self-efficacy theory explanation for the management of remote workers in virtual organizations. *Journal of Computer-Mediated Communication, 3*(4). https://doi.org/10.1111/j.1083-6101.1998.tb00085.x

[41] Sumbi, E. M., Venables, E., Harrison, R. Garcis, M., Iakovidi, K., van Cutsem, G., & Chalachala, J. L. (2021). It's a secret between us: A qualitative study on children and care-giver experiences of HIV disclosure in Kinshasa, Democratic Republic of Congo. *BioMed Central Public Health, 21*(313). https://doi.org/10.1186/s12889-021-10327-5

[42] Tucho, W. A., Tekelehaimanot, A. N., & Habte, M. B. (2021). Disclosure status and associated factors among children on antiretroviral therapy in Ethiopia, *Pediatric Health, Medicine and Therapeutics, 12*: 299-306, https://doi.org/10.2147/PHMT.S314259

[43] UNAIDS Global AIDS Update 2023. Geneva: Joint United Nations Programme on HIV/ AIDS. Licence: CC BY-NC-SA 3.0 IGO.

[44] UNICEF, (2023). https://data.unicef.org/topic/hivaids/global-regional-trends/#:~:text=Of%20the%20estimated%2039.0%20million,were%20children%20aged%200%2D19

[45] Vreeman, R. C., Scanlon, M.L., Tu, W., Slaven, J., McAteer, C., Aluoch, J., Ayaya, S., & Nyandiko, M. E. (2019). Validation of an HIV/AIDS stigma measure for children living with HIV and their families. *Journal of the International Association of Providers of AIDS Care*, *18*. https://doi.org/10.1177/2325958219880570

[46] Wamala, K., Nuwamanya, R., & Muwanga., M. (2021). Prevalence of HIV and associated risk factors among infants born to HIV positive mothers attending Entebbe Regional Referral Hospital. *Student's Journal of Health Research Africa, 2*(3), 11. https://doi.org/10.51168/sjhafrica.v2i3.40

[47] WHO. (2011). Guideline on HIV disclosure counseling for children up to 12 years of age. Available at https://www.ncbi.nlm.nih.gov/books/NBK304307/

[48] Wiener, L., Mellins, C. A., Marhefka, S., & Battles, H. B. (2007). Disclosure of an HIV diagnosis to children: History, current research, and future directions. *Journal of Developmental and Behavioral Pediatrics, 28*(2), 155–166. https://doi.org/10.1097/01.DBP.0000267570.87564.cd

[49] Wu, Y., Howarth, M., Zhou, C., Hu, M., & Cong, W. (2019). Reporting of ethical approval and informed consent in clinical research published in leading nursing journals: A retrospective observational study. *BioMed Central Medical Ethics, 20*(94). https://doi.org/10.1186/s12910-019-0431-5

[50] Yami, D. B., Tuji, T. S., Gelete, B. W. M., & Workie, K. B. (2022). Disclosure status of HIV-positive children and associated factors among children in public health facilities in East Arsi zone, Oromia regional state, South Eastern Ethiopia: A cross-sectional study. *SAGE Open Medicine, 10*. https://doi.org/10.1177/2050312121106