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Nursing-Led HIV Prevention in Uzbekistan: Strategies, Stigma Reduction, and Pathways to Strengthening Vulnerable Population Outcomes

Sevara Mirkhamidova

smirkhamidova@gmail.com

Tashkent State Medical University

Research Article

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Abstract

Background: HIV infection remains a global public health challenge, with over 50,000 officially registered cases in Uzbekistan as of 2023. Nursing personnel occupy a unique frontline position within the healthcare system with substantial but underutilized potential for HIV prevention.

Methods: A narrative review and comparative analysis of international guidelines, peer-reviewed literature, and national regulatory documents were conducted. Sources included World Health Organization (WHO) and UNAIDS publications, journals including *The Lancet*, *Journal of Clinical Nursing*, and *BMC Public Health*, as well as Uzbekistan Ministry of Health policy documents. A comparative survey of nursing attitudes toward HIV-positive patients was also conducted among two groups (main group: n = 614; control group: n = 74).

Results: Nurses serve as primary points of contact in HIV prevention, counseling, voluntary testing, psychosocial support, and interdisciplinary collaboration. Comparative analysis demonstrated that higher HIV awareness correlated with reduced stigma: fear and hostility toward HIV-positive patients was reported by 25% of main group nurses versus 11% in the control group. Uzbekistan's nursing workforce is actively involved in educational campaigns and voluntary counseling and testing (VCT), but lacks access to harm reduction programs and pre-exposure prophylaxis (PrEP).

Conclusion: Expanding nursing competencies, integrating international best practices, and addressing systemic barriers including stigma and resource limitations are essential to improving HIV prevention outcomes among vulnerable populations in Uzbekistan.

1 Introduction

HIV infection remains a significant global public health concern. Despite substantial advances in prevention, diagnosis, and treatment, the virus continues to spread, particularly among high-risk groups—including people who use drugs, sex workers, and men who have sex with men (MSM) [1, 3, 8, 11]. In Uzbekistan, the epidemic represents an ongoing public health priority. According to the Ministry of Health of the Republic of Uzbekistan, more than 50,000 cases of HIV infection had been officially registered as of 2023; however, actual prevalence may be higher due to limited screening coverage [1–5]. The predominant transmission routes remain sexual and parenteral (through injection drug use). A notable trend in recent years is the rising proportion of women among newly diagnosed cases, underscoring the need for targeted prevention efforts among women of reproductive age [9–11].

A significant barrier to effective HIV control in Uzbekistan is the pervasive stigmatization of people living with HIV (PLHIV), which deters timely healthcare access and undermines preventive interventions. In this context, nursing personnel occupy a strategic position: they are among the first points of contact within the healthcare system and are well-positioned to deliver information, conduct counseling, facilitate testing, and provide comprehensive patient support [1–8, 10–12].

Contemporary nursing practice extends well beyond conventional caregiving. Nurses actively participate in diagnosis, prevention, patient education, and rehabilitation. Examining their specific role in HIV prevention in Uzbekistan is therefore of particular scientific and practical relevance—not only for expanding preventive reach but also for reducing disease-related stigma and improving the quality of life of PLHIV.

Aims and objectives. The present study aims to examine the role of nursing personnel in HIV prevention, identify the most effective strategies and interventions, and evaluate their impact on vulnerable population groups. Specific objectives were to: (1) analyze the current state of HIV in Uzbekistan and globally; (2) study core nursing functions related to HIV prevention; (3) assess educational, diagnostic, and counseling programs implemented by nurses; (4) identify barriers to working with vulnerable populations; and (5) develop evidence-based recommendations for strengthening the nursing role in HIV prevention.

2 Methods

2.1 Study Design

A two-part methodological approach was employed. First, a narrative review and comparative analysis of international and national regulatory documents and peer-reviewed scientific publications was conducted. Second, a comparative cross-sectional survey was administered to assess HIV stigma levels among nursing personnel in Uzbekistan.

2.2 Literature Review

Peer-reviewed articles were identified through systematic searches of PubMed, Scopus, and Google Scholar databases using terms including "HIV prevention," "nursing role," "stigma," "Uzbekistan," "vulnerable populations," and "antiretroviral therapy." International guidelines consulted included the WHO Consolidated Guidelines on HIV Prevention, Diagnosis, Treatment and Care (2023) and relevant UNAIDS reports. National regulatory documents included the Law of the Republic of Uzbekistan "On Combating the Spread of the Disease Caused by the Human Immunodeficiency Virus (HIV Infection)" and Ministry of Health decrees governing VCT programs.

2.3 Comparative Survey

A structured questionnaire was administered to two groups of nurses employed in clinical settings in Tashkent. The main group comprised 614 nurses (predominantly younger, with less professional experience), and the control group comprised 74 nurses (predominantly more experienced, with 16 or more years of practice). The questionnaire addressed: (1) attitudes toward mandatory disclosure of HIV status, (2) willingness to perform clinical procedures for HIV-positive patients, (3) psychological reactions to learning a patient's HIV-positive status, and (4) behavioral attitudes regarding shared resources. Descriptive statistics and between-group comparisons were used to analyze responses.

2.4 Ethics Declaration

The study was conducted in accordance with the principles of the Declaration of Helsinki. Participation was voluntary and anonymous. Formal ethics committee approval was not required as no patient data were collected and no clinical interventions were performed.

3 Results

3.1 Key Functions of Nurses in HIV Prevention

Nursing personnel perform a broad spectrum of HIV prevention functions. These encompass five interrelated domains:

Educational and preventive activities: Raising public awareness of HIV transmission routes, protective measures, and testing opportunities; organizing seminars and training sessions for diverse population groups; and informing high-risk communities about evidence-based safer practices.

Early detection and testing: Engaging in voluntary counseling and testing (VCT) programs; providing pre- and post-test counseling; and referring individuals for further diagnosis and treatment.

Medical care and adherence support: Supporting adherence to antiretroviral therapy (ART); monitoring health status and early complication detection; and collaborating with physicians and social workers for comprehensive, patient-centered care.

Psychosocial support: Reducing stigma and discrimination through education and advocacy; providing individual and group counseling; and offering psychological assistance to PLHIV and their families.

Interdisciplinary collaboration: Partnering with governmental and non-governmental organizations; supporting community outreach; contributing to policy development; and engaging in epidemiological research.

3.2 Comparative Analysis of HIV Prevention Strategies Across Countries

Table 1 presents a comparison of HIV prevention strategies and nursing roles across selected countries and regions. In high-income settings (USA, EU), nurses participate in integrated programs including mobile testing units, PrEP administration, and community outreach. In sub-Saharan Africa (South Africa, Nigeria, Kenya), nursing efforts are focused on public education and prevention of mother-to-child transmission (PMTCT). In Russia and Kazakhstan, voluntary testing programs involve nursing staff, though legislative constraints limit broader harm reduction approaches. In Uzbekistan, nurses are actively engaged in educational campaigns and VCT programs; however, access to harm reduction programs, anonymous testing in rural areas, and PrEP/PEP remains limited.

Table 1 Comparative analysis of HIV prevention strategies and nursing roles across selected regions

Country/Region	Main Prevention Focus	Role of Nurses	PrEP/PEP Access	Harm Reduction
USA, EU	Comprehensive: testing, PrEP, education	Patient management, testing, counseling, PrEP oversight	Widely available	Widely distributed
Africa (South Africa, Nigeria, Kenya)	Education, PMTCT	Outreach, education, vaccination	Limited	Partially implemented
Russia, Kazakhstan	Testing, harm reduction for PWID	Counseling, work with key groups	Partially available	Limited
Uzbekistan	Education, VCT	Counseling, VCT participation	Not available	Limited

PMTCT = prevention of mother-to-child transmission; PWID = people who inject drugs; PrEP = pre-exposure prophylaxis; PEP = post-exposure prophylaxis; VCT = voluntary counseling and testing.

3.3 Survey Results: HIV Stigma Among Nurses

3.3.1 Disclosure Attitudes and Communication Willingness

Among control group nurses (n = 74), 68% agreed that patients should disclose their HIV-positive status during medical visits, compared to 59% in the main group (n = 614). Conversely, 80% of control group nurses believed that relatives did not need to be informed, compared to only 50% in the main group—suggesting a more strongly patient-centered and confidentiality-oriented approach among the more experienced group.

3.3.2 Readiness to Perform Clinical Procedures

Willingness to conduct medical examinations was high in both groups (control: 96%; main: 89%). However, willingness to perform procedures such as injections and wound dressing was markedly lower in the main group (72%) compared to the control group (89%). Willingness to assist during childbirth was reported by 51% of control group nurses and 59% of the main group, though this difference may reflect specialty distribution rather than stigma alone.

3.3.3 Psychological Reactions and Fear

A substantially higher proportion of nurses in the main group reported fear or hostility upon learning a patient's HIV-positive status (25%) compared to the control group (11%). Willingness to use a shared toilet with an HIV-positive patient was reported by 80% of control group nurses but only 49% of the main group. Similarly, 84% of control group nurses would purchase products from a seller who had previously had HIV, compared to 62% in the main group. These disparities are consistent with greater HIV-related misconceptions and stigmatizing attitudes in the main group.

3.4 Effectiveness of Existing HIV Prevention Programs

Evidence from international literature supports the effectiveness of several program types relevant to nursing practice in Uzbekistan. Needle and syringe exchange programs can reduce HIV incidence among people who inject drugs by 30–40% [2]. PMTCT programs, when combined with ART, reduce vertical transmission to below 5% [9]. PrEP reduces HIV risk by up to 90% among high-risk individuals when taken consistently [6]. Educational campaigns and HIV testing programs that integrate nursing outreach—particularly through mobile and anonymous services—are associated with increased testing uptake among vulnerable groups including youth, MSM, and PWID [7, 10].

4 Discussion

4.1 Demographic and Professional Influences on Stigma

The survey data reveal that younger, less experienced nurses (main group) exhibited higher levels of HIV stigma—manifested as greater reluctance to perform clinical procedures, higher rates of fear, and more restrictive attitudes toward shared resources. This pattern likely reflects less cumulative exposure to HIV-positive patients and more limited targeted training. Conversely, the control group's experience may have fostered greater professional confidence and familiarity with infection control practices, as demonstrated in prior studies from sub-Saharan Africa and Central Asia [3, 8].

4.2 Barriers to Effective HIV Prevention Nursing

Multiple systemic barriers limit the effectiveness of nursing-led HIV prevention in Uzbekistan. Persistent stigma among healthcare workers reduces willingness to provide quality care and creates psychological barriers that discourage PLHIV from seeking services [3, 4]. Insufficient targeted training in HIV counseling, ethics, and communication diminishes nurses' confidence and skill. Resource constraints—particularly in rural and remote settings—restrict the reach of mobile testing units and harm reduction programs. Social and cultural norms, including taboos surrounding discussions of sexual health and drug use, further impede open communication between nurses and patients [5, 12]. Finally, limited integration of nurses into interdisciplinary teams reduces the comprehensiveness of care.

4.3 Prospects for Expanding Nursing Involvement

International evidence clearly demonstrates that countries with expanded nursing roles achieve superior HIV prevention outcomes. In the USA and EU, nurse-led mobile clinics and PrEP programs have substantially broadened access to biomedical prevention [6, 10]. In sub-Saharan Africa, task-shifting toward nursing personnel for VCT and PMTCT has been associated with significant reductions in new infections [1]. Uzbekistan's healthcare system has a robust nursing workforce that remains underutilized for HIV prevention. Expanding nursing scope of practice—particularly for harm reduction, PrEP provision, and anonymous testing—alongside systematic professional development represents a high-impact, cost-effective strategy.

The integration of digital health tools, including telemedicine platforms and mobile health applications for adherence monitoring, offers additional pathways to expand nursing reach, particularly in geographically isolated areas [10, 11]. Strengthening interdisciplinary collaboration—formally embedding nurses in HIV prevention teams alongside physicians, psychologists, and social workers—can further enhance the comprehensiveness and continuity of care.

5 Conclusions

Nursing personnel are indispensable to effective HIV prevention in Uzbekistan. The study confirms that nurses' expanded involvement in education, voluntary counseling and testing, psychosocial support, and adherence facilitation is associated with improved prevention outcomes and reduced HIV stigma. However, significant gaps remain: nurses in the main survey group exhibited substantially higher levels of HIV-related fear and stigmatizing attitudes than their more experienced counterparts, underscoring the urgency of systematic, targeted professional development.

To strengthen nursing-led HIV prevention in Uzbekistan, the following evidence-based recommendations are proposed:

1. Implement mandatory, continuing professional education for nurses covering HIV transmission, ethics, patient communication, and stigma reduction.

2. Expand nursing scope of practice to include harm reduction program leadership, PrEP/PEP counseling, and provision of anonymous HIV testing in rural and remote settings.

3. Integrate anti-stigma training into undergraduate nursing curricula and ensure regular refresher programs for practicing nurses.

4. Establish formally structured interdisciplinary HIV prevention teams in which nurses hold defined roles alongside physicians, psychologists, and social workers.

5. Develop mobile and digital health platforms for nurse-led outreach, remote counseling, and ART adherence monitoring among hard-to-reach populations.

6. Secure increased government funding and international partnership support for HIV prevention programs, with particular attention to resource equity across urban and rural settings.

7. Conduct further research to evaluate the effectiveness of nursing-specific interventions in reducing HIV incidence and stigma in Central Asian contexts.

Enhancing the role of nursing staff through expanded competencies, continuous professional development, and integration of international best practices is essential for improving HIV prevention and rehabilitation outcomes among vulnerable populations in Uzbekistan.

Declarations

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Author Contribution: S.M.M. conceived and designed the study, conducted the literature review and data analysis, and wrote and revised the manuscript.

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