Igor Toskin et al.

Behavioural interventions for sexually transmitted infections

A combination approach of behavioural and biomedical interventions for prevention of sexually transmitted infections

Igor Toskin, a Nataliia Bakunina, b Antonio Carlos Gerbase, a Karel Blondeel, a Rob Stephenson, c Rachel Baggaley, a Massimo Mirandola, d Sevgi Okten Aral, e Marie Laga, f King Kennard Holmes, g Christine Winkelmann h & James Njogu Kiari e a

b Institute for Leadership and Health Management, I.M. Sechenov First Moscow State Medical University, Moscow, Russian Federation.
c Department of Systems, Population and Leadership, University of Michigan, Ann Arbor, United States of America (USA).
d Department of Diagnostics and Public Health, University of Verona, Verona, Italy.
e Centers for Disease Control and Prevention, Atlanta, USA.
f Institute of Tropical Medicine, Antwerp, Belgium.
g Department of Global Health, University of Washington, Seattle, Washington, USA.
h Federal Centre for Health Education (BZgA), Köln, Germany.

Correspondence to Igor Toskin (email: toskini@who.int).
(Submitted: 28 May 2019 – Revised version received: 16 January 2020 – Accepted: 17 January 2020 – Published online: 29 April 2020)

The World Health Organization (WHO) estimated that in 2016 the global annual incidence of four of the most common curable sexually transmitted infections (chlamydia, gonorrhoea, trichomoniasis and syphilis) among 15- to 49-year-olds was 376.4 million infections.1 The increased number of etiological pathogens known to be sexually transmissible, such as Zika and Ebola viruses, new outbreaks of acquired and congenital syphilis and lymphogranuloma venereum, increasing antimicrobial resistance in Neisseria gonorrhoeae and potential such resistance in other sexually transmitted infection pathogens, such as Treponema pallidum and Mycoplasma genitalium, raise additional concerns.2 Facing a global epidemic of sexually transmitted infections, the international public health agenda now emphasizes the importance of strengthening the control of such infections, including human immunodeficiency virus (HIV), through a combination prevention approach. This approach consists of the simultaneous use of rights-based, evidence-informed and complementary behavioural,
biomedical and structural interventions operating at individual, relationship, community and societal levels. The roles of and synergy between behavioural and biomedical approaches to sexually transmitted infections and/or HIV prevention are currently being debated. The latest research and programmatic agenda often only give priority to biomedical approaches.³

Behavioural interventions have demonstrated effectiveness in reducing the incidence of sexually transmitted infections, including HIV incidence, in various target groups and in a range of settings, whether these interventions are incorporated into combination prevention programmes or delivered separately.⁴⁻⁶ Several meta-analyses have shown that single-session behavioural interventions are as effective as more resource-consuming multisession intensive behavioural interventions for sexually transmitted infections and/or HIV transmission.⁴,⁵,⁷ Clearly, the findings differ across studies, varying in terms of intervention type and length, theoretical foundation, setting and study design. Most of the studies were conducted in the United States of America and mainly high-income countries, suggesting the need to examine the role of combining behavioural with biomedical interventions for the reduction of these infections in low- and middle-income countries (Fig. 1).

**Behavioural interventions**

Before introducing behavioural interventions (including brief interventions), in the context of combination prevention programmes, the needs of different populations should be assessed, followed by the development of targeted programmes and interventions. Programmes will need to include skills training for providers, with a focus on shifting cultural and attitudinal norms where needed; implementation and scaling up of the behavioural programmes, monitoring and evaluating patients’ progress must also be considered. Implementation should start with demonstration projects in settings where it is most feasible, and if successful, expanded to more challenging settings, engaging with antagonists, and using social and mass media to promote behavioural interventions.

Positive attitude towards sexuality, based on the core concepts of well-being (safety, autonomy and satisfaction) and promotion and protection of human rights, is a key step towards achieving positive health outcomes (Fig. 2).⁸ This notion is applicable to all thematic areas of sexual and reproductive health, including prevention and care of sexually transmitted infections (including HIV) and their sequelae, as agreed by stakeholders from all continents during the development of a conceptual framework for sexual health.⁹
In 2015, WHO recommended that policy-makers promote brief sexuality-related communication when possible – that is, a brief behavioural intervention with training for health-care providers to deliver such communication in diverse health-care settings. Brief sexuality-related communication is a clinical tool grounded in behaviour change theories; it is primarily based on motivational interviewing techniques, encompasses a holistic and positive understanding of sexual health and sexuality and addresses client-driven sexual health goals in a single session shorter than 25 minutes within primary health-care settings. Such communication has great potential if used as part of a combination prevention approach to reduce the incidence of sexually transmitted infections, including HIV, but wider experience is needed for implementation at the country level.

Challenges

Several barriers can hamper successful integration of behavioural interventions into existing services. Health systems are complex and introducing new strategies is not easy, especially when they relate to sexual issues and require additional contact between providers and clients. Strategic planning is often inadequate due to insufficient understanding of how an intervention works, how it fits into existing procedures, and what synergies may exist with other interventions already in place. The economic implications of providing behavioural interventions and making them accessible must be considered to ensure that sexual health services are affordable. However, research on this cost is scarce. A recent literature review on the cost–effectiveness of prevention interventions of sexually transmitted infections in low- and middle-income countries yielded only one behavioural intervention study. That study assessed an online education programme for adolescents attending public schools in Colombia and concluded that the cost per sexually transmitted infection averted was between 95 and 824 United States dollars. Another systematic review summarized evidence from 60 studies on the cost–effectiveness of HIV prevention interventions in sub-Saharan Africa. That review included only one study assessing the impact of behaviour change, but none concerning impact of behavioural intervention. Numerous studies have assessed cost–effectiveness of various biomedical sexually transmitted infections and/or HIV prevention interventions, but estimates from implementation scenarios that consider local context, mixture of concurrent interventions, epidemics, individual adherence, time period and population, are still not available. Thus, further economic analysis and cost–effectiveness analyses are needed, comparing specific biomedical and behavioural interventions within a combination prevention approach where both interventions complement each other.
The effect sizes of behavioural interventions are complex to measure and mostly small when it comes to outcome indicators, such as decreased incidence of such infections. Furthermore, a lack of evidence on the persistence of intervention effects exists. More evidence needs to be generated on how to move from promising findings to scaling up interventions in resource-constrained settings within existing health systems using available resources (technical expertise and human, physical and financial resources). The main issue with the current research on behavioural interventions to prevent sexually transmitted infections and/or HIV is the lack of a common framework within which to assess why and when something may or may not work. Determining the active component of such interventions could provide a basis for designing reproducible and more effective interventions.

A disconnect between bodies that recommend behavioural interventions and the government health departments responsible for the implementation exists. Support and guidance on how to roll out behavioural interventions to prevent these infections are desirable, as are experience, training and skills of the health-care providers in delivery of brief behavioural interventions and in discussing topics around sexuality. Brief sexuality-related communication guidelines recommend this approach for prevention of sexually transmitted infections among adults and adolescents in primary health services and training of health-care providers in sexual health knowledge and the skills of such communication. Even as interventions become accessible, and are provided and used, skills, delivery and impact must be assessed.

**The way forward**

Main priorities to support successful introduction of behavioural interventions in the context of the combination prevention approach, and its challenges, are summarized in Box 1. The key novel element to be addressed is training of health-care providers grounded in the understanding of the concept of healthy sexuality. A standardized brief sexuality-related communication intervention and relevant training for providers, consistent with related guidelines, is currently being piloted in Peru and the Republic of Moldova, and adapted to the local contexts and target population needs using qualitative methods. The principles of motivational interviewing have been also widely implemented in the mental health field, particularly for substance-abuse disorders. Furthermore, the objective of universal health coverage provides a favourable platform for integration of such interventions. Importantly, health promotion to encourage healthy diets, more physical activity and regular early
screening, and smoking and alcohol consumption cessation – often with the use of digital technologies – is currently the main approach in noncommunicable disease prevention. This approach creates an enabling environment for combining the efforts within primary prevention programmes in noncommunicable and communicable diseases, including sexually transmitted infections and/or HIV, where motivational interviewing aimed at behaviour change towards a healthy lifestyle could be a universal communication tool between providers and clients.

In general, the combination prevention approach could benefit from the promotion of sexual health as a pivotal public health concept. Long-term outcomes of the proposed strategy will include a paradigm shift from a disease-centred approach to sexual well-being, to better trained health-care providers with a positive attitude towards sexuality and tailored behavioural interventions linked to biomedical approaches in one package to prevent sexually transmitted infections and/or HIV.

**Conclusion**

Brief behavioural interventions delivered in addition to and/or as part of a package with biomedical interventions are active ingredients of effective strategies for sexually transmitted infections prevention. Complementary behavioural and biomedical interventions form a comprehensive combination prevention solution that can increase the positive impact on sexual health, including the decrease of these infections. Behavioural interventions will only be effective if their design is evidence-informed and tailored to the target groups, local settings and cultural contexts, and if health-care providers are sufficiently trained. The content of the intervention and the training should be based on the personal and social aspects of human sexuality. Therefore, additional evidence on the feasibility of new and promising behavioural interventions, and procedural guidelines for effective delivery and implementation of behavioural interventions, are needed. Strategic cooperative actions will allow the addition of these behavioural tools to constructively complement the biomedical solutions that are already employed, to more successfully control sexually transmitted infections and HIV epidemics.

**Competing interests:**

None declared.
References


Box 1. Key priorities to advance behavioural interventions for sexually transmitted infections and/or HIV prevention and reduction

- Train health-care providers in communication and culturally sensitive competence around sexuality.

- Develop an intervention manual and guidelines, including provider training, on behavioural interventions and brief sexuality-related communication in particular.

- Tailor behavioural interventions to various target groups through close collaboration with the target population and their health-care providers.

- Gain understanding of the technical capacity of health-care providers and their supervisors to integrate new activities at their health centres.

- Simplify all interventions for easier integration into existing services and systems.

- Make interventions affordable and more accessible.

- Strategically link biomedical and (brief) behavioural interventions in the process of planning and implementation.

- Engage decision-makers, civil society groups and all gatekeepers – from the policy level to the facility and community level – in the initial stages of programme development and implementation.

- Take advantage of opportunities to use information and technologies and mobile health applications to reduce, though not replace, or complement the time required for human interaction with a client.

- Set up appropriate study designs, including randomized controlled trials and mixed-method studies, and disaggregate the data on each component or active ingredient of each intervention, to examine what is or is not actually effective.

- Develop, evaluate and promote behavioural interventions in a way that is linked to the currently available and forthcoming biomedical interventions (pre-exposure prophylaxis; circumcision; point-of-care, community-based and self-administered testing; and multi-purpose prevention technologies).a

HIV: human immunodeficiency virus.

a Multipurpose prevention technologies are products that provide protection against both unintended pregnancy and sexually transmitted infections, including HIV.
**Fig. 1. Biomedical and behavioural intervention strategies for combination prevention**

**Biomedical intervention strategies**
- Diagnosis and treatment of STI
- Needle and syringe programmes designed to prevent HIV prevention and opioid toxicity
- Voluntary medical male circumcision
- Male and female condom provision (both biomedical and behavioural)
- Vaccination (e.g. HPV vaccine, hepatitis B vaccine)
- Immediate ART for all people diagnosed with HIV without any restrictions of CD4 counts
- PrEP and PEP
- ARVs in PMTCT services
- Prevention and management of comorbidities, including hepatitis, TB, and mental health conditions
- Blood safety, standard precautions in health care settings

**Behavioural intervention strategies**
- Promotion of sexual well-being through Brief Sexuality-related Communication
- Behavioural Interventions to promote:
  - partner reduction
  - condom use
  - uptake of STI & HIV testing, counselling and treatment
- Comprehensive sexuality education
- HIV testing and risk-reduction counselling
- Interpersonal communication, including peer education and persuasion
- Social marketing of prevention commodities and condoms
- Cash incentives for individual risk avoidance

---

**How Behavioural Interventions can complement and strengthen biomedical interventions**

**Awareness:** demand creation, peer outreach, social media

**Self-efficacy:** reducing stigma and discrimination, legal and social issues

**Uptake:** risk perception, risk screening, choice

**Ability:** providing motivation and skills to enable safe behaviours

**Adherence:** disclosure, peer support, reminders

**Retention:** combination of all of the above

---


Note: The figure lists the complementary biomedical and behavioural interventions for combination prevention and presents suggested areas of focus for behavioural interventions that can complement and strengthen biomedical strategies to prevent and reduce sexually transmitted infections and/or HIV.

Source: Consolidated guidelines on HIV prevention, diagnosis, treatment and care for key populations – 2016 update.
Fig. 2. Core concepts underlying sexual and reproductive health

Core concepts
Sexuality based on autonomy, wellbeing, and fulfillment, promotion, and protection of human rights

Reproductive health areas and outcomes
Aim: promotion of safe reproductive lives
1 Contraception/birth spacing
2 Antenatal care
3 Obstetric and postnatal care
4 Prevention and management of sub-fertility and infertility
5 Mental-health issues related to RH

Common SRH areas and outcomes
1 Prevention and care of STIs/HIV and their sequelae
2 Prevention and management of gender-based violence, including sexual violence
3 Prevention and management of unsafe abortion
4 Stigma and discrimination on the basis of sexual orientation or gender
5 Prevention of harmful practices and traditions

Sexual health areas and outcomes
Aim: promotion of safe, satisfying, responsible, and autonomous sexual lives
1 Services for sexual dysfunction
2 Mental health issues related to sexual health

Source: Adapted from Hawkes.⁸