

Revitalizing Condom-Centered HIV Prevention Strategies

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Abstract HIV infection rates remain steady in the USA despite the numerous prevention programs and tools available. Condoms play a central role in HIV prevention because they are highly effective, readily available, and affordable. Unfortunately, condom promotion efforts often incite fear as a motive force, while also taking the common “one-size-fits-all” approach. Reframing condom promotion through a sexual health framework, focusing on pleasure and highlighting condom fit issues, improves intervention efficacy. Condom distribution policies may further perpetuate condom users’ difficulty, by withholding particular condom styles, brands, and information highlighting the nuances in shape, size, and material. Condom education and distribution practices focused on pleasure, proper fit, and condom access issues might increase condom utilization among high-risk populations.

Keywords Condoms · Condom usage · Condom distribution · Condom education · Condom fit · Condom access · Sexual health · HIV/AIDS · Evidence-based interventions · HIV prevention · Sexual behavior · Sexually transmitted infections

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Introduction

According to the Centers for Disease Control and Prevention (CDC), HIV infection rates in the USA remain stable at approximately 50,000 new infections per year [1]. Overall, the CDC estimates 1.1 million people currently live with HIV in the USA, and of the HIV-infected individuals, approximately one in six are unaware of their HIV infection [2]. Among HIV-positive individuals who are aware of their status, approximately one third will continue to engage in unprotected vaginal or anal intercourse [3]. One study reports approximately 50 % of heterosexual and homosexual HIV-positive participants engaging in unprotected sexual encounters within the last 3 months [3]. Though HIV infection rates remain relatively stable, impacts of HIV have shifted greatly over the last few decades due to comprehensive information about the virus and its transmission, along with increased availability and confidence levels in biomedical interventions, like highly active antiretroviral treatment (HAART) for treatment and prevention purposes. Researchers have yet to determine how increased emphasis on antiretroviral availability for both HIV-positive and HIV-negative individuals impacts risky sexual behavior. Regardless of our society’s evolving relationship with HIV and increased focus on biomedical interventions, it may supersede prevention messages that incorporate condom promotion.

Condoms, however, still serve as an essential element in HIV prevention since they are highly effective and widely available for free or at low cost. Even with effective and accessible medications for treatment and preexposure prophylaxis (PrEP), new infection rates remain high and steady, suggesting that individuals may not be using condoms consistently enough. Unfortunately, the frequency of condom use is largely unknown, due to difficulties in soliciting accurate

and generalizable information regarding condom use [4]. Researcher Richard Crosby reviewed advances in condom literature, including recent improvements in condom-use frequency assessments, in his article “State of condom use in HIV prevention science and practice” [5••]. Advanced technologies such as smart phone apps often utilized by higher-risk populations can easily solicit event-specific information, which minimizes reported errors on condom use that are common when recalling sexual histories. Crosby also discusses innovations in condom design, advances in condom efficacy research through new study designs, and improved behavioral intervention efficiency by focusing on condom-specific promotion and education approaches from a sex-positive perspective [5••]. Many of the insights shared by Crosby are reflected and expanded upon within new condom literature, including a pilot-studies and needs assessment conducted by the author of this article.

While conducting one condom-related needs assessment with Seattle-area men who have sex with men (MSM), several issues arose, expanding further upon topics previously addressed by Crosby [6••]. Topics such as condom fit, access, and education took precedence throughout focus group sessions and individual interviews, mirroring many of the concerns present in condom discourse and literature. Condom distribution policies from community-based organizations and public health departments in Seattle, San Francisco, and New York City overlap with condom-use and access issues discussed by participants and will also be addressed. The insight gained throughout this needs assessment come directly from the unique perspectives of high-risk individuals themselves, providing the foundation for his article.

Sexual Health Approaches to Condom Promotion

In 2002, health and sexuality professionals within the World Health Organization (WHO) developed a working definition of sexual health. WHO proposes that new government policies and public health approaches related to sex and sexuality move beyond illness or healthy reproduction to include and promote pleasure as an essential component to an individual's health and well-being. Hence, sexual health approaches require confronting many different barriers keeping individuals from achieving health and happiness, including HIV. Unfortunately, many HIV prevention and condom promotion efforts are fueled by fear-based messaging and scare tactics encouraging audiences to protect themselves from the deadly virus.

Such condom messages tend to ignore evidence that shows the pursuit of pleasure that drives individuals to partake in sexual encounters with partners [7]. Utilizing sexual health models of HIV prevention focusing on pleasure promotion—aimed at supporting individuals with integrating condoms and

make them the norm—could revive condom promotion efforts. Social marketing for condoms is demonstrated to produce positive and substantial condom-use outcomes [8•]. Unfortunately, current condom promotion often takes a “one-size-fits-all” approach, mainly encouraging correct and consistent use. Research on young adults from the UK ranging in ages 16–24 suggests that merely encouraging condom use is not enough, but condom promotion should also include such factors as expressing a caring attitude toward one's sex partner and challenging the notion that one cannot derive sexual pleasure with condom use [9•]. This same study found that a risky sexual behavior “appears to be more driven by their perceptions of the positive rather than the negative consequences of unprotected sex [9•].” Through a sexual health lens, positive perceptions might be derived from the comfort and security in knowing that safer sex leads to good physical and mental health. Therefore, delivering condom-related messaging and promotion through a sexual health framework could increase its efficacy by promoting pleasure, safety, and self-worth [9•, 10]. Condom promotion campaigns including pleasure as a motivating factor, emphasizing enhanced sensitivity and sensuality, have been demonstrated to lead to a rise in condom uptake and safer sex [7].

Condom Fit

By ignoring the nuances and differences in available condom varieties, “a condom is just a condom,” as one Seattle-based needs assessment participant stated. This problematic perspective is common though it could not be further from the truth. Condom manufacturers produce hundreds of condom varieties, utilizing different combinations in sizes, shapes, textures, and materials. Various condom styles are produced to fit the variance in the length, circumference, and shape of the male penis. The Food and Drug Administration regulates current condom sizes, enforcing a minimum length (160 mm), minimum thickness (0.03 mm), and maximum width (54 mm) [11]. Manufacturers produce a wide range of condom sizes, with the averages of being 52 ± 2 mm in diameter and the mean condom length of 185 mm [12]. Smaller condoms, often referred to as “snug” fit, tend to be shorter and tighter fitting (49 ± 2 mm). Condom companies also produce longer condoms and wider condoms to accommodate men with larger than average penises. Though the term “standard” is often used to describe an average condom fit, there is no official standard condom measurement with regard to length, width, thickness, or shape. There are several unique condom shapes, and the most common is the straight shaft, which maintains a consistent width throughout the shaft, from tip to base. A “fitted” or “contoured” condom fits tighter below the crown or head of the penis to stimulate the user in their more

sensitive spots. “Baggy” and “flared” condoms provide more room in the head area and are often preferred by men who do not like the restrictive feel of condoms. Condom manufacturers often claim that the nuances in condom structure and fit contribute to different sensations and increased perceptions of pleasure experienced throughout sexual encounters.

A majority of condom studies do not account for the wide variance of condoms used by subjects, and previous interventions encouraging condom use have often failed to address sexual issues, including difficulties with sexual arousal and maintaining erections while wearing condoms, decreases in sensation, and general condom fit issues [10, 13, 14••]. According to a study conducted across 14 countries, researchers attribute these barriers as key factors in an individual’s inconsistent or incomplete condom use [7]. To solicit more information on condoms’ impact on sensation, researchers recently utilized a quantitative, psychophysiological approach to gather more in-depth data by measuring penile sensory thresholds. These sensory measurements support men’s claims that condoms increased their sensitivity threshold, meaning condoms may decrease penile sensitivity [15••]. An individual in the Seattle-based needs assessment summarized this problem by saying, “It was like I was feeling more of the condom than the other person... It was so binding, I wasn’t aware of anything except this little straightjacket on me [6••].” Participants in both aforementioned studies were recruited due to self-reported condom-related issues, but how many men report similar difficulties with condoms?

Researchers who examined the impacts of condom fit on sensation, pleasure, and condom acceptability found that most men (60–71 %) had “no” or “few” complaints about condom fit and feel [13, 16•]. However, among men in one of these studies, less than 40 % claimed that finding condoms to fit their penises was “easy” [16•], and while a majority of individuals reported few problems with condom fit and feel, a significant number across five studies expressed issues with condom fit (30–40 %), warranting additional research and action [13, 16•, 17]. Of those who experienced condom fit issues, 23 % complained condoms were too short and too tight; many of the men with complaints also reported longer penile length and larger circumference [13]. A study on penis size in relation to condom use found that MSM who had recently engaged in unprotected insertive anal intercourse (UIAI) reported larger measures in penile length and circumference as well as average condoms fitting too tightly [16•]. Men with both larger and shorter penile lengths and circumference often had more negative perceptions in association with condoms and reported difficulty finding proper fitting condoms [16•, 18]. Evidence from these studies suggests that men experience difficulty finding condoms that fit their bodies properly, which ultimately impacts condom integration and utilization.

Important messages pertaining to condom varieties and styles in relation to varying body types often remain absent in sex education and safer sex promotion. Most Seattle-area men avoided talking about their bodies in focus group conversations and instead expressed condom knowledge by mentioning condom reputations and branding [6••]. As men make connections between their own body and condom fit, they move beyond confusing and misleading advertisements or messages about condom brands and reputations. In fact, men reported that particular condom brands and sizes caused loss of sensation, erection problems, and discomfort [19, 20]. Men in these studies suggested that choosing the right brand and style was the best solution to avoid these fit issues [19]. A lack of condom awareness may lead men to unknowingly choose condoms that do not fit their bodies properly, possibly perpetuating their resistance toward using them.

Research demonstrated that men who wore appropriately fitting condoms, both in length and circumference, were more satisfied with their condom use and experienced fewer condom-related problems [18]. In addition, men wearing “custom-fitted” condoms for anal sex experienced 80 % less breakage and significantly less slippage than when wearing a standard-sized condom [21]. Men in this same study expressed higher satisfaction ratings and higher levels of confidence in the efficacy of custom fit condoms than standard condoms while having anal sex [21]. These findings support the condom distribution that provides a large variety of condom sizes and brands, particularly larger condom styles that men prefer.

Researcher Robin Milhausen analyzed the benefits of providing multiple condom styles for young men to explore while conducting a condom fit study [14••]. Participants were given six types of condoms to take home to explore their fit and feel while gaining practice using them in a low-pressure environment. Young men participating in the study reported experiencing fewer instances of condom breakage and fewer problems with condom fit and feel throughout the study process than before study participation. Young male participants also reported fewer issues with maintaining an erection after familiarizing themselves with condoms, along with increases in condom use post-participation [14••]. This study serves as an example of an intervention that encourages and supports men by guiding them through the condom exploration and integration process, helping them find condoms that fit properly and feel great. Condom fit experimentation can be self-guided, home-based, and designed to promote consistent and correct condom use among men while promoting pleasure, condom-use skills, and self-efficacy [14••]. Individuals can overcome mental blocks and barriers associated with condoms, proving that they can maintain an erection and ejaculate while wearing a condom. Men also get the opportunity to practice with condom integration, putting it on properly and efficiently, and getting used to the feel, fit, and overall

condom experience. A simple condom fit intervention could revolutionize men's relationships with condoms and lead to increased use, which may reduce the transmission of HIV and other sexually transmitted infections (STIs).

Condom Distribution

Very few prevention programs and tools work for all high-risk populations the way condoms do. Based on empirical evidence, condoms are a cost-effective and cost-saving intervention, saving millions of dollars in future medical costs by preventing HIV transmission [22]. Biomedical interventions such as vaccines, microbicides, and antiretroviral drugs for treatment and PrEP provide great potential for preventing HIV infections but are either expensive or still in development stages. HIV prevention efforts including these biomedical approaches, as well as condoms, must be cost-effective for wide implementation. Comparing cost-effectiveness for various prevention efforts proves to be difficult however, and to date, no such cost analysis comparison could be located in the literature. In relation to other HIV prevention efforts, condoms are among the least costly prevention tools. However, even though condoms are highly cost-effective, limited funding streams continually restrict their distribution and availability.

Despite deep funding cuts, public health departments and community-based organizations distribute large quantities of free condoms as a component of their HIV and STI prevention efforts. A meta-analysis conducted on free condom distribution programs found that very little work evaluating these efforts and their impacts on condom utilization exists [8•]. One of the few studies on free condom distribution found that 59 % of MSM surveyed reported taking free condoms within the past year, with higher acquisition rates for younger men, men with higher numbers of sex partners, and those who had recently tested for HIV [23]. Of the men who accessed free condoms, 73 % reported using them [23]. These findings imply that free condom distribution remains an efficient and cost-effective way to deliver HIV and STI prevention tools. However, consumer's perceptions and knowledge regarding free condoms remain absent from the existing literature and may have an impact on acquisition and usage.

Furthermore, condom availability may inversely impact condom reputations, as a few Seattle-area men stated that they "rejected" condoms they saw offered for free throughout the community, often considering them "cheap" or "suspect." During a focus group session, a participant asked, "Aren't you wondering, is it the cheapest one on the market that they can get for less money?" Participants agreed, assuming the free condoms distributed in gay spaces were cheap and, therefore, less likely to be quality condoms that provide great sensation. A few men actively tried to avoid free condoms based on their "strange" off-brand names and other aspects

including flavors and textures. Public health officials from Seattle, San Francisco, and New York City all mentioned challenges in providing well-known and highly preferred condom brands due to higher costs while in a time of budget restrictions.

In an attempt to rectify this situation, Seattle and New York public health departments conducted condom-related needs assessment surveys. The results reflect previously mentioned issues regarding lack or preferred name brands, styles, and sizes, highlighting the need for variance in condom fit, with an increased distribution of thinner and larger-sized condoms [6••]. Public health entities and community-based organizations should consider conducting similar assessments or surveys to determine which condoms their communities prefer. Condom distributors could then use community responses to guide and revise programming and outreach efforts in order to increase the uptake and usage of condoms locally. In addition, public health departments distributing several condom types should consider providing information regarding condom varieties, highlighting differences by stating length, width, and thickness measurements, along with short descriptions of each condom style within each batch. Such an information sheet serves as an easy and inexpensive condom intervention, where community-based organizations may effectively relay this important condom information to their own communities in an accessible manner.

In comparison with other HIV prevention tools, condoms remain the most highly effective and relatively inexpensive intervention. If condoms prevent one HIV infection annually, districts could save thousands of dollars each year by avoiding HIV-related care expenses [22]. This cost saving warrants ordering the most highly sought-after condom brands and styles, regardless of increased costs. Current condom distribution may not meet the needs of men whose bodies do not pertain to "average-sized" condoms. By providing the full variety of condom shapes, sizes, and materials, HIV and STI prevention programs distributing these condoms may become more relevant and effective.

Future Work

Condom researchers are headed in the right direction, exploring how to overcome barriers to condom access and utilization, including focusing on fit and sexual pleasure. Many questions remain unanswered, possibly due to gaps in research and a lack of sufficient interest and funding. Unfortunately, a majority of condom studies do not account for the wide variance of condoms used by subjects, nor do they mention the length of sexual acts, actual sexual behaviors before and during condom use, how condoms are stored, condom negotiation, types of lubricants used, any insertion prior to penetration, or risky behaviors of sex partners [9•, 13].

Condom fit studies specifically focused on the variance in men's bodies, especially for circumcised and uncircumcised individuals, would be helpful to better understand user's experiences with condom fit. Even with an emphasis on the HIV prevention potential of biomedical interventions in the literature, we must not lose sight of condoms and their relevance.

The future of condoms relies heavily on changes in condom education and promotion, by focusing on sexual health and pleasure. Additionally, male-centered curriculum for condom use, fit, and targeted distribution remains at the center of public health initiatives for HIV and STI prevention. Even though approximately half of all HIV-infected people worldwide are women, prevention programs focused on female agency in relation to condom implementation have been sparse throughout the last few decades [24, 25]. Fortunately, female-centric approaches for eliminating the spread of disease are beginning to gain attention [26]. Women experience different obstacles when it comes to implementing condom use due to innumerable structural factors such as gender inequality, social norms of female sexual inexperience, and the threat of sexual and physical violence, all of which influence their agency to negotiate their own sexual health [25, 26]. Lack of proper reproductive education, health care, and threats of physical and sexual violence, along with general notions that men assert sex and women passively accept or reject, advances coalesce barriers for women to assert their sexual agency [25, 27, 28]. With more recent focus on gender inequalities surfacing, this one-sided approach leaves a serious gap in prevention efforts that should be addressed within the condom-related literature.

Ultimately, new and innovative condom designs may revolutionize the condom as we know it. The Bill and Melinda Gates Foundation recently awarded 100,000 dollars to fund 11 innovate condom designs, many of which boast new condom shapes, new skin-like materials that are strong yet sensational, and condom applicators [29, 30]. The Gates Foundation is also funding a project focusing on remaking the FC to be more "user-friendly" by integrating air infusion, enabling women to insert them hours before sexual activity [31]. The new generation of condoms may minimize barriers to condom use and revitalize their status as HIV/STI prevention tools.

Conclusion

Sexual health approaches for condom promotion that incorporate pleasure are demonstrated to increase condom utilization. In order to better understand condom fit experiences, additional research and interventions regarding variation in condom styles are required and should be conducted within this sexual health framework. An essential component to increased condom efficacy relies on distribution and education practices highlighting the variation of condom styles available

in relation to users' bodies as well as providing the condom brands most often sought out by users. As mentioned, condom fit interventions and dissemination of condom information sheets at distribution sites assist condom users in finding preferable condom styles. The wide variety of condom brands, shapes, and sizes warrants a more comprehensive approach to condom promotion that will lead to increased utilization due to better fit and heightened pleasure, subsequently reducing HIV/STI rates in at-risk communities.

Compliance with Ethics Guidelines

Conflict of Interest Joshua O'Neal and Lorree Berteau declare that they have no conflict of interest.

Human and Animal Rights and Informed Consent This article does not contain any studies with human or animal subjects performed by any of the authors.

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