

Tailoring sexual health interventions for middle-aged and older adults, including vulnerable populations: A scoping review

Ian Tyndall¹, Tess Hartland¹, Moitree Banerjee¹, Victoria Giacomelli¹, Isabelle Ball¹, Susan Churchill¹, Antonina Pereira¹, & Ruth Lowry²,

¹Department of Psychology, Institute of Education, Social, and Life Sciences, University of Chichester, Chichester, West Sussex, UK, PO19 6PE

²School of Sport, Rehabilitation and Exercise Sciences, University of Essex, Colchester, Essex, UK, CO4 3SQ

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Corresponding Author:

Dr. Ian Tyndall

Department of Psychology,

University of Chichester,

Chichester, West Sussex, PO196PE, UK

Email: I.Tyndall@chi.ac.uk

Abstract

Objectives This scoping review aims to synthesize existing literature on good practice in sexual health interventions for adults over 45 years and in vulnerable groups. **Methods** Using PRISMA-ScR guidelines, search terms focused on sexual health, good practice, and vulnerable groups, in over-45s. **Results** Of the 9 studies that met the inclusion criteria, 7 were focused on HIV and risk reduction. Use of alternative methods of communication, alongside inclusion of behavioral and cognitive measures such as condom use and perceived stigma, was key to tailoring interventions. **Conclusion** This review highlights the imperative for further research on sexual health interventions with these overlooked populations.

Key words Sexual Health, Older Adults, Intervention, Good Practice, Communication

Sexual health across the lifespan is an important area of public health (National Institute for Health and Care Excellence [NICE], 2019) and is defined as “a state of physical, emotional, mental and social well-being in relation to sexuality” (World Health Organization [WHO], 2006). International human rights bodies emphasize the availability of sexual health services to all adults (WHO, 2015b). Policy improvement across sexual health services – at least in high income countries – has typically focused on young people (under-25s), with sexual health and wellbeing of middle-age and older adults largely neglected (Baraitser et al., 2005; Thoss, 2013; Traeen et al., 2017; Traeen et al., 2019). In addition to the disparities in sexual health provisions for middle-age and older adults, there is a clear danger in ignoring the needs of vulnerable adults as asylum seekers, refugees, the homeless and sex workers are also neglected (British Association for Sexual Health and HIV [BASHH], 2016). Provision disparity is concerning given that sexually transmitted infections (STIs) among middle-age and older age groups are rising globally (Age UK, 2019; Lee, 2015; Minichiello et al., 2012), most likely attributable to changes in marital status in later life, the formation of new relationships and limited knowledge of STIs (Terrence Higgins Trust, 2018).

The potentially serious societal implications of this significant rise in STIs in middle-age and older adults for their overall health and wellbeing, along with an apparent lack of knowledge and awareness of good sexual health in this population, led to a large-scale European Union grant-funded project known as Sexual Health In Over Forty-Fives (SHIFT). The SHIFT project, a collaboration with partners from the UK, Belgium, and the Netherlands, aims to raise awareness, enhance knowledge, reduce stigma and increase access to services relating to sexual health wellbeing in middle-age and older adults (over-45s). The scope of the SHIFT project includes over-45s in vulnerable populations such as migrants, sex workers, refugees, homeless, and LGBT+ community. Furthermore, SHIFT will develop training programs for healthcare professionals and the wider workforce to enhance their knowledge and awareness of the particular sexual health needs and concerns of over-45s, thereby improving capacity to provide a tailored service. In alignment with the overriding goals of the SHIFT project, the present scoping review aims to synthesize existing literature on sexual health interventions for both the general population and vulnerable groups over the age of 45 years. Our key objective in this review is to identify *good practice* in sexual health provisions, particularly focusing on methods of communication and intervention delivery. Before we move on to a discussion of good practice, we will provide a brief overview of sexual health in middle-age and older adults and vulnerable groups.

Sexual Health: Middle-age and Older Adults

Almost 30% of the world’s population is aged 45 and over (Rabathaly & Chattu, 2018). As people experience longer and healthier lives, sexuality remains an important component of life (Bach et al., 2013; Fisher, 2010; Heidari, 2016; Sinković & Towler, 2019). Indeed, the World of Association

of Sexual Health (WAS, 2021) issued a declaration on sexual pleasure as a human right to be experienced across the lifespan (see also Coleman et al., 2021; Sladden et al., 2021). Sexual practice, sexual health and sexuality can change as a person ages due to a range of physical, psychological and social variables - which may impact life satisfaction and intimate relationship quality (Fisher, 2010; Sinković & Towler, 2019; Sladden et al., 2021). Evidence suggests that there are issues and risk behaviors in sexual health that are unique to middle age and/or older populations of 65+ years. In England, approximately 7% of new STI diagnoses were among individuals aged 45-64; however, this figure drops significantly after the age of 60 (Davies, 2016). The differences in sexual risk behaviors also varies according to age, with adults closer to middle-age more likely to report multiple sexual partners and/or sex without a condom, compared to older adults (Davies, 2016). Gender differences in the sexual concerns and difficulties of older adults are also noted, such as difficulties in sexual arousal and orgasm (women) and erectile function and difficulties (men; Davies, 2016). Middle-aged and older adults may face particular barriers to help seeking and advice for sexual health concerns. For example, Ezhova et al. (2020) identified four barriers to seeking support: (1) cultural and societal norms surrounding sex in older age can lead to perceptions of stigma, (2) embarrassment and discrimination, (3) lack of education and training provided to health professionals, and (4) the quality of relationship between patients and health professionals.

As acknowledged by Hogben et al. (2015), interventions related to sexual health are typically narrowly focused on reduction of adverse outcomes, rather than positive effects on increasing sexual health, wellbeing, and pleasure per se (Mitchell et al., 2021; Sladden al., 2021). Indeed, the literature that exists tend to focus on STI risks for older adults as a whole population, and does not distinguish between population-specific risks, barriers and facilitators in both older and middle age adults, despite recent calls for further age-specific evidence and interventions in the latter group (Dalrymple et al., 2017; Lewis et al., 2020). Additionally, there is evidence that within the 50-70 age population, STI rates are highest amongst those who are living in the most deprived areas (Davies, 2016).

Sexual health: Vulnerable Adults

The WHO (2016) identifies a need for countries to implement tailored sexual health services to meet the needs of populations most vulnerable and affected by STIs. Vulnerable groups vary according to context, but may include: asylum seekers and refugees, sex workers, prisoners, drug users and homeless people (WHO, 2016). Research indicates that female sex workers are 13 times more likely to contract HIV than other women of similar reproductive age (Hernandez et al., 2019). Irregular migrants, refugees and asylum seekers appear to be at increased risk of STIs – potentially resulting from experiences of sexual violence and exploitation (WHO, 2018). Other sexual health risk factors for vulnerable groups include: concerns around human rights, limited proficiency in the destination country's language, influences of faith and cultural factors, and the impact of stigma and

shame (BASHH, 2016; Beck et al., 2005; Frohlich & Potvin, 2008; Metusela et al., 2017; Public Health England & Department of Health and Social Care, 2018; Simpson et al., 2009). Health care services should ensure that vulnerable individuals such as refugees, sex workers, drug users and homeless are identified and have access to appropriate care (NICE, 2018). Of particular relevance to vulnerable populations, Fava and Fortenberry (2021) propose a trauma-based sex positive approach to care and practice based on the following framework: safety, trust, transparency, collaboration and mutuality and empowerment, choice, and voice, along with additional screening for trauma, post-traumatic growth and healing, and access to knowledge, services and resources. To improve the services for middle-aged and older adults, including those from vulnerable groups, one of the first steps is to identify good practice in sexual health interventions.

Good Practice

Good practice refers to the methods and activities of successful health interventions, including the monitoring, evaluation and implementation (Horodyska et al., 2015). Key principles of best practice in sexual health commissioning include: prioritizing prevention of poor sexual health, strong leadership and collaboration, focusing on outcomes, addressing wider determinants of sexual health, meeting the needs of vulnerable groups, and good quality intelligence about services and outcomes for monitoring purposes (Department of Health [DH], 2013). Good practice in sexual health interventions can have a positive influence on overall population health and wellbeing (Hind, 2013). Given the objectives of the SHIFT project, elements of Good Practice might further include raising awareness and enhancing knowledge around sexual health and wellbeing while also reducing stigma and increasing access to services.

A particular concern, however, in identifying good practice in sexual health provision and education programs is the heterogeneity (see Hogben et al., 2015) in outcome measures employed to assess efficacy and acceptability of interventions employed and general lack of consistency in the evaluation of sexual health interventions (Begley et al., 2021; Chou et al., 2015). The use of scientifically validated reliable outcome measures is needed in order to effectively inform sexual health policy and the development of effective interventions (Begley et al., 2021; Chou et al., 2015).

This paper aims to systematically review literature that exists on current practice in psychosocial and educational sexual health interventions, focusing on adults who are 45 years and older including vulnerable populations. Due to the paucity of literature on sexual health and wellbeing needs in these populations, an exploratory scoping review of quantitative studies that provided outcome measure data was selected given that this approach efficiently enables the capture of all relevant evidence regardless of study design (Arksey & O'Malley, 2005). This will be the first review to assess good practice in sexual health interventions for over-45s, including vulnerable groups. It is

important to acknowledge here that the review is limited to the SHIFT project's development aims and therefore does not include pharmacological interventions in sexual health (e.g., Viagra intervention studies) or sexual health changes post-cancer treatment.

Methods

Procedure

The protocol for this scoping review was derived from the Preferred Reporting Items for Systematic Reviews and Meta-analysis (PRISMA-ScR) guidelines (Tricco et al., 2018). Each stage of the methodology was finalized upon consultation with the all authors in order to validate the review procedure (Arksey & O'Malley, 2005).

Search Terms

Search terms focused on sexual health (sexual health/ sexual wellbeing/ STIs/ STDs/ HIV), good practice (good practice/ best practice/ intervention/ policy/ guideline), over-45s (adult/ elderly/ senior/ middle age), and socio-economically disadvantaged groups (vulnerable/ at risk/ deprived/ disadvantaged) in publications from the following databases: ERIC (The Education Resources Information Centre), PubMed, PsycINFO via EBSCO, and Web of Science. Limits were applied only for English language, with no limitation on date of publication. The search for literature took place in November 2019 and was subsequently updated in December 2021.

Screening and Inclusion Criteria

During screening, inclusion criteria were: (1) original, empirical research published in a peer-reviewed journal, (2) participant inclusion was restricted to a mean age of 45 years or above, (3) outcomes focused on psychosocial or educational sexual health interventions. Titles and abstracts were screened on the sequential eligibility criteria, and then the full text versions of the remaining articles were assessed. The second author screened each eligible article and the articles selected were reviewed independently by the first and third authors; any discrepancies arising during the review were discussed and resolved.

Data Charting and Synthesis of Results

Any instance where an element of information was not reported in the article is stated in the data-charting form. The information captured included: Author(s); year of publication; Study location; Sexual health subject; Study aims; Study population (e.g. age, socio-economic status); Study design; Intervention; Outcome measures; and Main outcomes relevant to review (see Arksey & O'Malley, 2005).

Results

Search Flow

The search across four databases yielded 8012 papers: PsychINFO via EBSCO (5581); Web of Science (278); PubMed (1937); ERIC (243). Papers were screened against the inclusion criteria and relevant studies were reviewed, resulting in nine included papers (see Figure 1). The most common reasons for exclusion were: not focused on ageing populations (*M* age of sample 45 years or over), not targeting sexual health, not involving an intervention and, not original, empirical research in a peer-reviewed journal.

Study Characteristics

Details of the papers included are summarized in Table 1. The majority of studies (all from the US) focused on HIV ($N = 7$), one targeted sexual dysfunction and one, unintended pregnancy and STIs. One paper reported on a sub-set of participants from an intervention in the review (Echenique et al., 2013), while two studies involve different participants from the same intervention (Lovejoy et al., 2011; Lovejoy & Heckman, 2014). While this review concerns only quantitative evaluations of interventions, the study designs vary. Some studies followed a randomized controlled trial (RCT) design ($N = 4$), with one study involving a pre-post design. Other studies randomized participants between control and intervention groups ($N = 3$), or the two intervention arms ($N = 1$). Seven studies had a follow-up phase, typically 6-months post intervention ($N = 6$).

Participant Characteristics

The mean age of participants in the studies ranged from 44.6 (DeMarco & Chan, 2013) to 60.05 years (Adams et al., 1996). The mean percentage of female participants included in the studies was 46.37%, while Echenique et al. (2013) reported on women only from the initial Illa et al. (2010) study to analyze their outcomes specifically. Most papers involved predominantly African-American participants ($N = 6$, 58%- 94.5%). One paper involved three study sites: participants were mainly African-American at Site 1 (60.1%), and Caucasian at Sites 2 (66.3%) and 3 (64.5%; Conners et al., 2012).

All the studies included at least one indicator of socio-economic status when reporting participant demographics, however there was little uniformity in how this was recorded. Five studies recorded the education level of participants, while others included history of homelessness ($N = 1$), household income ($N = 2$), or multiple indices (household income, education, employment status) ($N = 1$). Demographic data was used in three papers to identify participants as low-income, or having low socio-economic status whilst six did not classify participant's data to socio-economic status.

Interventions and their Content

Studies utilized both therapeutic ($N = 3$) and preventative ($N = 2$) approaches in their interventions, with some using a combination of the two ($N = 4$). Most interventions were delivered to service users ($N = 8$), while one intervention was offered to healthcare professionals. One intervention was offered to couples, rather than individual service users (Adams et al., 1996). Support was delivered through physical group sessions ($N = 6$), individual telephone interviews ($N = 2$), while the healthcare professional intervention employed computerized clinical reminders, alongside group training sessions. One study chose to reach participants with an internet-based intervention. The shortest intervention duration lasted 90 mins (Connors et al., 2012), the majority lasted 4 weeks, while others lasted 12 weeks ($N = 1$), and 18 months ($N = 1$).

Main Findings

Overall, many of reviewed studies reported significant effectiveness of the interventions for several outcomes, as reflected in Table 1.

Behavioral Changes

Three studies underpinned their interventions with theories of behavior change: namely, Illa et al. (2010) used the Information-Motivation-Behavior Skills (IMB) Model of AIDS risk behavior change, with principles of self-efficacy theory; Lovejoy et al. (2011) used motivational interviewing guided by the Transtheoretical Model; and finally Swartz et al. (2011) used a range of theories (Expanded Theory of Reasoned Action, Theory of Gender and Power, Information-Motivation-Behavior Theory and Social Learning Theory) in designing their internet based program. Significant reductions in sexual risk were reported following psycho-educational groups sessions designed to reduce high risk sexual behavior in older, HIV-positive adults (Illa et al., 2010; Echenique et al., 2013) and improvements in healthcare adherence following a peer-led writing intervention (DeMarco & Chan, 2013) or motivational interviewing (Lovejoy et al., 2011).

Cognitive Changes

Attitudes and beliefs surrounding unintended pregnancy and STIs ($p = .027$, $d = 0.35$), and behavioral intentions measures ($p = .015$, $d = 0.39$) were significantly better 7-day post-test, following an internet-based program (Swartz et al., 2011); however, at 30-day follow-up, only behavioral intention remained significantly higher ($p = .039$, $d = 0.33$). Knowledge and beliefs about sexual dysfunction improved following an active discussion education intervention ($F_{(1, 60)} = 32.92$, $p < .001$; Adams et al., 1996).

Echenique et al. (2013) demonstrated HIV knowledge increased (26.6 at baseline to 28.7 at 6-month follow-up, $p < .01$), whilst stigma decreased (104.6 at baseline, and 96.5 at 6-month follow-up, $p = .05$) following psycho-educational groups sessions. Self-advocacy in sexual/intimate relationships improved ($n = 91$, Pillai's trace = 7.21, $df = 2$, $p < .01$), following a tailored, peer-led, and culturally relevant structured writing intervention for HIV-positive women (DeMarco & Chan, 2013). Two studies reported improvements in self-efficacy of unintended pregnancy, STI prevention, partner communication and healthcare provider communication (Swartz et al., 2011), and of ability to engage in safe sex (Illa et al., 2010). However, short-term changes were not sustained at the 30-day follow-up (Swartz et al., 2011). By contrast, psycho-educational group discussions did not appear successful in significantly improving self-efficacy in HIV-positive women (Illa et al., 2010).

Engagement in interventions

In the absence of retention to the interventions being reported, follow-up non-completion rates could be used as a proxy for this measure. Low rates of participant attrition were observed in the tele-MI intervention (8% at 3 months, 5% at 6 months: (Lovejoy et al., 2011). During a four-week structured writing intervention, retention was 85.5% (DeMarco & Chan, 2013) which is similar to the online multimedia intervention (88.4%) of Swartz et al. (2011). The uptake of rapid HIV testing (Connors et al., 2012) demonstrates that engagement in this intervention was high: rates at two of the three sites remained significantly higher during the post-intervention period than at baseline. By contrast, after a four-session psychoeducational group intervention, just 34.23% of participants completed the 6-month follow-up interview (Illa et al., 2010). Successful retention of participants was explained by few studies; one study ascribed retention to an intervention to the influence of peer-leadership and local location (DeMarco & Chan, 2013).

Good Practice in Sexual Health Interventions

Elements of good practice discussed in the studies are identified below, including: tailoring interventions, and methods of communication.

Tailoring interventions

The diversity of interventions reflects the consideration of tailoring approaches to different populations. Studies mention the need to be age-appropriate ($N = 6$). Interventions such as Illa et al. (2010) and Echenique et al. (2013) were adapted to address issues relevant to older populations, using psychoeducation that targets their needs. Others emphasize the potential of film, video, tele-health and internet hosted multimedia in providing age-appropriate interventions (DeMarco & Chan, 2013; Lovejoy et al., 2011; Swartz et al., 2011). Two interventions address gender sensitivity; using gender-specific prompts including using information on how STIs may impact upon women specifically

(Swartz et al., 2011) or videos of women's experiences of HIV to stimulate discussion (DeMarco & Chan, 2013). Cultural relevance was considered in one intervention, where films consisted of authentic HIV experiences told from the perspective of black women (DeMarco & Chan, 2013).

Some papers acknowledge the need to consider other physical and mental health conditions, and how these conditions may influence, sexual health and engagement with services ($N = 3$). Healthcare professionals engaged with mental health providers in anticipation of patient anxiety (Conners et al., 2012), while other studies suggest that experiences such as chronic mental health, history of addictions and the complexity of taking multiple medications could limit the effectiveness of interventions (DeMarco & Chan, 2013). Two studies express consideration for comorbidities in interventions, where simple self-reporting measures and telephone-delivered interventions could be of benefit (DeMarco & Chan, 2013; Lovejoy et al., 2011). According to one study, the importance of personalized "health goals" is useful in to promote safe sex that works with their lifestyle (Lovejoy et al., 2011).

As many interventions involved service users considered at-risk or vulnerable to poor sexual health outcomes, some interventions address tailoring approaches to these populations ($N = 2$). For example, Conners et al. (2012) engaged with individuals with substance use disorders, which are at a higher risk of HIV infection. The intervention provided flexibility for adapting to rapid-testing depending on the clinic workflow, staff and volume of patients. Extensive training was presented to the healthcare professionals including patient education strategies (Conners et al., 2012). DeMarco and Chan (2013) consider their older, low-income and Black participants to experience increased risk of poor sexual health due to factors such as racial stigma, lower health education and sustained experiences of partner violence and chronic mental health comorbidities. As such, their intervention was tailored to provide a safe and supportive environment, promoting positive feedback on pieces written by participants, that is non-judgmental and non-critiqued, providing nutritious meals, and incorporating a guided mindfulness meditation exercise (DeMarco & Chan, 2013).

In order to tailor interventions to service users and contexts, co-creation and consultation was employed by three studies. DeMarco and Chan (2013) collaborated with the general public from a similar demographic background to the intervention target group, Swartz et al. (2011) collaborated with reproductive health experts in designing their intervention for midlife women and Conners et al. (2012) consulted health professionals in shaping their training program

Communication

Communication is crucial in order for interventions to be effective. Diverse media was used to engage participants, with most studies using a combination of methods, such as educational handout materials ($N = 5$), film ($N = 3$), animation ($N = 1$), structured writing sessions ($N = 1$), group

discussions lead by facilitators ($N = 5$), individual motivational interviewing ($N = 2$), checklists and quizzes ($N = 1$), and training directed by PowerPoint presentations ($N = 1$).

All effective interventions involved an element of education and/or knowledge sharing. Two studies addressed elements of patient-provider communication in their interventions (Conners et al., 2012; Swartz et al., 2011). Other interventions encourage knowledge sharing and communication between intimate partners to strengthen sexual health interventions (Adams et al., 1996; Echenique et al., 2013; Illa et al., 2010; Swartz et al., 2011). Peer-educators are described as central to one intervention's success (DeMarco & Chan, 2013).

Discussion

This scoping review, the first to assess good practice of sexual health interventions for both general population adults and vulnerable groups over the age of 45, identified nine papers which presented original, empirical, quantitative research focusing on sexual health interventions for ageing populations. Of these studies, just four summarized RCTs. To set this in context, a systematic review of reviews to identify interventions for reductions in risky sexual behavior among young people, yielded 37 systematic reviews, summarizing 244 primary RCTs (Denford et al., 2017). While the focus of the present review was on identifying good practice in sexual health provision for middle-age and older adults and vulnerable groups, rather than on STI per se, it must be acknowledged that most studies ($N = 7$) included in our review focus on HIV prevention, diagnosis and management. While our search of the literature was worldwide, it was a stark finding that all studies that met the inclusion criteria originated from the US. This highlights a clear gap in the literature and knowledge of sexual health interventions for middle-aged and older adults and vulnerable groups, in general, and particularly in relation to populations outside of the US.

Good Practice in Sexual Health Interventions

Evidence suggests that tailored interventions, designed to address the nuanced needs of participants have greater efficacy compared to standardized interventions (Beck et al., 2010). While no studies in the present review used the term *co-creation* (Lesak et al., 2019), it is clear that taking a co-creative approach offers an effective targeted intervention tailored to the needs of the population (Conners et al., 2012; DeMarco & Chan, 2013; Swartz et al., 2011). Co-creation, as used here, refers to the process of bringing together the experience and views of experts in sexual health promotion and intervention in mid-to-old adults and vulnerable groups along with the views and expressed needs of a sample of the target population themselves, to inform the development of more distinctive and more practically useful interventions. For example, Swartz et al. (2011), in a collaborative process, convened a panel of sexual health experts, conducted focus groups with ethnically diverse women, and pilot tested the usability of their model.

While research employing co-creation with vulnerable groups is limited in international health literature (Halvorsrud et al., 2019), there is some evidence that this methodology leads to improved effectiveness and adherence to interventions (Leask et al., 2019). Leask et al. (2019) suggest a framework to ensure co-creation is conducted in a systematic, reproducible way – which is often lacking when utilizing this approach (Halvorsrud et al., 2019). Differences in physiology, uptake of risky sex behaviors and general health demonstrate the need for interventions to be tailored for gender (Lee et al., 2016). Two interventions were adapted for women only, for instance, DeMarco and Chan (2013) adapted their intervention by using videos of women’s experiences of HIV to stimulate participant reflection and discussion around coping with and living with an STI and sexual health in general. No studies considered how interventions may be adapted for middle-aged or older male and LGBTQ+ populations. This is concerning as there is evidence that this group experiences unique risks to their sexual health and wellbeing, particularly when intersecting with ageing (Fredriksen-Goldsen et al., 2015).

Due to the heterogeneity of sexual health and wellbeing needs among over-45s, it is important to facilitate a tailored intervention approach (Tremayne & Norton, 2017). Whereas most of the studies included in the review recruited participants of diverse ethnic backgrounds (for example $N = 6$ include between 58%-94.5% African-American participants) few documented whether, or how, the intervention was tailored to accommodate diversity. Culture and ethnicity impact sexuality and sexual function (Heinemann et al., 2016), therefore it is pertinent that sexual health interventions are tailored for specific cultural and ethnic groups. As Ahluwalia et al. (1999) noted, it is quite easy to pay attention to superficial characteristics or surface structures of a population (e.g., clothing, location, music, food, and language) when developing interventions rather than the more pertinent deep structure influences on targeted health behavior (e.g., social, cultural, historical, and environmental factors).

When designing interventions for older adults, as both life expectancy and the incidence of chronic illness increases (Træen et al., 2017), it is advisable to explore how comorbid psychiatric conditions, general mental wellbeing and relate to sexual health (Moghalu et al., 2020). Lovejoy and Heckman (2014) found that the extent of depressive symptoms influenced the effectiveness of motivational telephone interviews. Lovejoy et al. (2015) concluded that treatments addressing risky sexual behaviors rather than depression alone are necessary to reduce sexual risk behavior among depressed older people living with HIV/AIDS. As Connors et al. (2012) suggest, sexual health providers may engage with mental health services to provide more holistic care.

Stigma towards sexuality in older age is a major barrier related to seeking sexual health advice and treatment (Ezhova et al., 2020). There is a need to provide safe sex resources in a supportive and stigma-free environment (Nash et al., 2015). Lovejoy and Heckman (2014) conducted

a telephone-based intervention with the aim to overcome stigma associated with HIV and ageing. Technology-based interventions have been shown to be favorable with HIV-positive users, due to the privacy they provide (Holloway et al., 2017). HIV stigma which impacts upon sexual health and behavior (Turan et al., 2017), was a reported outcome measure (using the HIV Stigma Scale) in two studies (DeMarco & Chan, 2013; Echenique et al., 2013). DeMarco and Chan (2013) found their structured writing intervention produced no significant effect HIV stigma by contrast, Echenique et al. (2013) found a significant reduction in perceived HIV stigma 6-months following their psychoeducational intervention. While both interventions were four weeks in duration, it may be that the combination of past trauma, comorbidities and histories of addiction limit the effectiveness of a short intervention for some participants (DeMarco & Chan, 2013).

Communication is an essential component of good practice. However, stigma, fear of judgement, and embarrassment are just some of the barriers that need to be addressed to permit successful communication of sexual health and wellbeing information and advice to over-45s (Hughes & Lewinson, 2015). Diverse media was used throughout the eight interventions, with most using a combination of communication methods, such as educational handouts, film, and open discussion.

Effective interventions involved elements of education, or knowledge sharing (Connors et al., 2012). This is encouraging, as research demonstrates that older adults are reluctant to talk about sex with health providers (Malta et al., 2020). Similarly, health providers lack the tools and knowledge to raise the subject of sexual health with older adults (Schaller et al., 2020). One study found that less than 25% of participants had sex-related discussions with physicians since turning 50 (Bergeron et al., 2017). Furthermore, it is common for older people to have a paternalistic relationship with health practitioners and as such expect them to initiate discussions on sex (Ezhova et al., 2020). Studies suggest that medical education programs should include how to discuss sexual health with older patients. This would aim to overcome false assumptions of sexual inactivity and asexuality in older adults, thus normalizing practitioner-client discussions (Ezhova et al., 2020; Politi et al., 2009).

Common practice shared by interventions is to encourage communication between partners (Adams et al., 1996; Echenique et al., 2013; Illa et al., 2010; Swartz et al., 2011). Literature suggests that sexual communication between partners is a positive predictor of healthy sexual behavior and sexual satisfaction in older adults (Gillespie, 2017; Velten & Margraf, 2017). Demarco and Chan (2013) reported that the presence of peer leaders for their intervention helped build trust, continuity and connection with participants. While there is limited research investigating peer-led sexual health interventions for middle-aged and older adults, evidence suggests open and equal communication facilitated by peer educators is effective for younger age groups, whereby life experiences are more easily understood (Benton et al., 2020; Dobson et al., 2017). Peer educator programs have been used with older adults in relation to other health behaviors (Conner et al., 2015; Khong et al., 2017), and

could be adopted to overcome barriers to open and equal discussions about sexual health and wellbeing (Benton et al., 2020).

Of the range of cognitive and behavioral outcome measures to evaluate interventions, the most commonly measured behavioral change was increased condom use, as well as increased consistency in condom use (DeMarco & Chan, 2013; Illa et al., 2010; Echenique et al., 2013). It is promising that sexual health interventions of varied design such as peer-led writing and psychoeducational group sessions were both successful in achieving positive behavioral change such as increased condom use (DeMarco & Chan, 2013), or reductions in inconsistent condom use during sex (Echenique et al., 2013; Illa et al., 2010). However, future research in this area needs to include more well-established and validated cognitive and behavioral outcome measures to allow for more meaningful and reliable scientific comparisons to be made, and conclusions drawn, across intervention studies.

Certain sub-groups such as LGBTQ+, migrants and homeless people are absent in sexual health intervention literature for ageing populations. This is important as their needs and priorities with regard to sexual health differ. For example, migrants and refugees could have insufficient knowledge of professional services and health resources (Sheikh & MacIntyre, 2009) which prevents them accessing mainstream services. Similarly, people without secure accommodation may have limited opportunities to discuss and learn about sexual health in a safe and health promoting setting (Wikström et al., 2018). Therefore, future interventions should address the inequalities in services.

There are limited interventions or studies giving insight into the sexual health needs and provision for elderly adults. Data extracted from this review included participants with mean age between 44.6 (DeMarco & Chan, 2013) to 60.05 years (Adams et al., 1996). Ezhova et al. (2020) suggested further research could include participants aged 70+. This is particularly important as sexual health is affected by changing circumstance throughout the life course, and whether one is “young old”, “mid old” or “old” (Foley, 2015). Furthermore, all the studies included in this review were based in the US, so future studies could be more representative of sexual health in a range of high- and low- income countries, and westernized and non-westernized cultures.

Recently, sexual satisfaction has been conceptualized as a successful component of ageing (Rahn et al., 2020), while Foley (2015) found that sex remains an important source of pleasure for many entering older life. Taylor et al. (2016)’s participants reported that sex has become more pleasurable after 50. This present review found only one study that discussed ways to achieve sexual satisfaction and fulfilment (Lovejoy et al., 2011) with ageing populations. While exploratory research exists in this area (Rahn et al., 2020; Smith et al., 2019), and conceptual pieces promote and advocate for a focus on sexual pleasure across the lifespan (Sladden et al., 2021), interventions are lacking. Hence, addressing sexual satisfaction, pleasure and fulfillment is an essential component of

intervention development. Relatedly, Mitchell et al. (2021) have recently developed a framework for sexual wellbeing that could be a useful approach to adapt for interventions with for mid-to-older adults.

Furthermore, designs of future research studies should allow for between-group analyses across control and intervention groups, rather than solely focusing on changes occurring within groups. Lovejoy et al. (2014) warn against gathering sexual behavior data using only self-report measures, recommending that objective measures should be incorporated in future studies to corroborate participant reports. Moreover, future studies evaluating the effectiveness of interventions should take clear measures of participation attrition as few studies in the present review have reported on attrition rates.

Limitations

Firstly, we only included studies with English language abstracts. Additionally, ‘grey literature’ or doctoral theses were not included in this review. At the outset when setting exclusion criteria, we decided not to include grey literature due to the fact that it is typically not peer-reviewed, standards very widely in detail of methodology reported, and quantitative data is rarely provided beyond rudimentary descriptive statistics level. However, future reviews with a different remit might benefit from examination of the sexual health intervention grey literature for the older and vulnerable populations. As is typical in scoping reviews (Pham et al., 2014), no studies were excluded due to the quality of the research studies. The search strategy was limited to empirical intervention studies; for example, papers consisting of qualitative and descriptive information were excluded. Inconsistencies in outcome measures and study design, alongside discrepancies in defining ageing populations and socioeconomic status hindered extraction of data and comparative quantitative analysis of different aspects of interventions. As all studies that fitted the inclusion criteria originate from the US, and were predominantly HIV focused, the generalizability and transferability of these findings to other contexts is somewhat limited.

Conclusion

This scoping review highlights components of good practice that should be incorporated into sexual health interventions for middle-aged and older adults, including vulnerable groups. In order to be effective, interventions must be tailored to accommodate the specific needs of this heterogeneous population, that are often excluded from current service provision. Furthermore, adopting alternative methods of communication, such as peer-leaders, and ensuring information is relevant, could help to alleviate stigma, normalize discussion around sexual health, and strengthen the impact of interventions. Lastly, behavioral and cognitive measures, such as condom use and perceived stigma, prove useful when evaluating sexual health interventions. Participant characteristics must be explored to ensure outcome measures are sensitive to their lived experiences, particularly for vulnerable groups

who may be at higher risk of poor sexual health, but are less likely to seek help and advice. Future intervention-based research could also more explicitly focus on targeting the three key aspects – physical, mental, and social – highlighted in the WHO (2006) definition of sexual health and wellbeing, along with adapting recently developed frameworks for sexual wellbeing in general public (Mitchell et al., 2021) and more vulnerable populations (Fava & Fortenberry, 2021). We hope this study will help raise awareness of the needs of over-45s in terms of sexual health, pleasure, and wellbeing (Sladden et al., 2021), and highlight the necessity to improve the utility, effectiveness, and uptake of sexual health services for middle-age and older adults, which is often a stigmatized and misunderstood subject.

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Table 1: Overview of included studies

Author(s), publication year, study location	Sexual health subject	Aim of study	Study population	Study design	Intervention	Outcome measures	Main Outcome
Adams et al. (1996), USA	Sexual dysfunction	To evaluate the psychometric properties of a brief instrument designed to assess information and beliefs regarding sexual functioning in an ageing population. The Sexual Beliefs and Information Questionnaire is a criterion-referenced test that includes 25 items derived from current literature on sexual myths and behavioral and medical etiological factors in erectile dysfunction. A secondary aim was to identify sexual health myths and areas of misinformation frequently endorsed by the sample.	Evaluation of effectiveness of intervention (study 3)- $N = 63$ Mean age: 60.05 ± 9.65 Gender: male only Ethnicity: 79.4% Caucasian; 20.6% African American Relationship status: 82.5% married; 11.1% divorced	2-arm randomization of participants 1. Active discussion educational intervention where education materials were discussed with partners 2. Control (standard educational intervention where education was not shared with partners)	Type: discussion educational intervention Aim: to gain knowledge on sexual dysfunction and treatment and discuss this education with partners Duration: NR	Knowledge and beliefs about sexual dysfunction	Knowledge: Improved post-intervention, with a time effect for the sexual beliefs and information questionnaire ($F(1, 60) = 32.92, p < .001$).
Conners et al. (2012), USA	HIV	To implement a nurse-initiated HIV rapid testing strategy, and evaluate its uptake and success.	Subclinic Site 1- $N = 835$ Mean age: 54 ± 9.5 Gender: 96.2% male Ethnicity: 60.1% African American;	1-arm pre-post design based at 3 sites 1. Nurses received training on rapid HIV testing and	Type: nurse-initiated HIV oral rapid testing strategy Aim: to increase rates of HIV	HIV testing rates	HIV testing rates: Rapid testing rates from baseline to 6 months post-intervention - Site 1: 2% to 5%, $p < .05$ Site 2: 1.2% to 1.1%, $p >$

			31.4% Caucasian Relationship status: 42.5% single/never married; 14% married Subclinic Site 2- $N = 80$ Mean age: 54.6 ± 11.7 Gender: 98.8% male Ethnicity: 66.3% Caucasian; 8.7% African American; Relationship status: 27.5% single/never married; 22.5% married Subclinic Site 3- $N = 623$ Mean age: 50.3 ± 11.4 Gender: 95.5% male Ethnicity: 64.5% Caucasian, 33.5% African American, Relationship status: 30.7% single/never married, 15.4% married	computerized clinical reminders	testing via nurse training and a computerized clinical reminder Duration: 18 months		.05 (NS) Site 3: 0% to 24%, $p < .05$ Total number of tests (rapid and blood) from baseline to 6 months post-intervention - Site 1: 23.5% to 26.9%, $p > .05$ (NS) Site 2: 20.9% to 11.1%, $p < .05$ Site 3: 21.7% to 32.2%, $p < .05$
DeMarco & Chan (2013), USA	HIV	To test the feasibility and assess outcomes of healthcare adherence based on engagement with risk behaviors.	$N = 110$ Mean age: 44.6 ± 8.05 Gender: women only Ethnicity: 94.5% African American; 3.6% Latina Relationship status: 48.2% single, never	2-arm RCT 1. Peer-led structured writing group 2. Control (group with same inclusion criteria as intervention met with peer-leader but	Type: peer-led structured writing group Aim: to improve healthcare adherence and reduce engagement in risky behaviors Duration: 4 weeks	Healthcare adherence; HIV stigma; Self-advocacy	Healthcare adherence: Condom use ($n = 69$, $F = 8.02$, $df = 1$, $p < .01$) and safe sex ($n = 71$, $F = 13.02$, $df = 1$, $p < .01$) improved for intervention group. HIV stigma: Differences between groups NS. Self-advocacy: Time

			married; 12.7% married	did not undertake structured writing)			effect in the Silencing the Self Scale ($n = 91$, Pillai's trace = 7.21, $df =$ 2, $p < .01$), reduction in intervention group.
Echenique et al. (2013), USA *	HIV	To report the 6-month outcomes of a secondary prevention intervention designed to reduce high risk sexual behavior in older HIV-positive adults. This study reported on female participants from Illa (2010).	Recruited: $N = 300$ Intervention - $N = 65$ Age: ≥ 45 Gender: women only Ethnicity: 87.5% African-American; 6.3% Hispanic; 6.3% White Relationship status: 44.6% single/not living together; 36.9% divorced/separated; Control - $N = 41$ Age: ≥ 45 Gender: women only Ethnicity: 78% African-American; 12.2% Hispanic Relationship status: 56.1% single/not living together; 36.6% divorced/separated	2-arm randomization of participants 1. Psycho- educational group sessions 2. Control (given an educational brochure on sexual risk reduction and received care as usual)	Type: psycho- educational group sessions Aim: to share information on HIV, discuss effects of HIV on sexual behaviors, the practice of harm reduction, communication with partners, practicing and maintaining safer sex Duration: 4 weeks	Sexual risk; HIV knowledge; Stigma	Sexual risk: Inconsistent condom use with all partners reduced in the intervention group from 20% at baseline, to 9.2% at 6-month follow-up (p $< .05$). Control group NS. Inconsistent condom use with positive/ negative/unknown serostatus partners NS for both groups. HIV knowledge: Knowledge index score was 26.6 at baseline for the intervention group and 28.7 at 6-month follow up ($p < .01$). For the control group, the knowledge score at baseline was 27.3, and 28.5 at 6-month follow up ($p = .05$). Stigma: Mean stigma score was 104.6 at baseline and 96.5 at 6- month follow-up for the intervention group ($p <$.05). NS for control group.

Illa et al. (2010), USA *	HIV	To report the 6-month outcomes of a secondary prevention intervention designed to reduce high risk sexual behavior in older HIV-positive adults.	Recruited: $N = 300$ Intervention - $N = 149$ Mean age: 50.82 ± 4.97 Gender: 55.7% male; 43.6% female Ethnicity: 78.4% African-American; 14.2% Hispanic Relationship status: 54.4% single/not living together; 33.6% divorced/separated Control - $N = 92$ Mean age: 50.77 ± 4.59 Gender: 55.4% male; 44.6% female Ethnicity: 79.3% African-American; 13% Hispanic Relationship status: 55.4% single/not living together; 35.9% divorced/separated	2-arm randomization of participants 1. Psycho-educational group sessions 2. Control (given an educational brochure on sexual risk reduction and received care as usual)	Type: psycho-educational group sessions Aim: to share information on HIV, discuss effects of HIV on sexual behaviors, the practice of harm reduction, communication with partners, practicing and maintaining safer sex Duration: 4 weeks	Sexual risk; HIV knowledge; Sexual self-efficacy	Sexual risk: Inconsistent condom use with all partners reduced in the intervention group from 17% at baseline, to 7% at 6-month follow-up ($p = .003$). Inconsistent condom use with negative/ unknown serostatus partners reduced from 9% at baseline, to 1.3% at 6-month follow-up ($p = .003$). HIV knowledge: Knowledge index score was 26.95 at baseline for the intervention group and 28.36 when measured at 6-month follow-up ($p < .001$). For the control group, the knowledge score at baseline was 26.89 and 28.02 at 6-month follow-up ($p = .011$). Sexual self-efficacy: Change NS for any group.
Lovejoy & Heckman (2014), USA **	HIV	A secondary analysis to examine the moderating effect of baseline depressive symptoms on telephone-administered motivational interviewing (Tele-	Recruited: $N = 100$ Intervention 1 - $N = 62$ Mean age: 54 ± 4.5 Gender: 56.4% men; 43.5% women Ethnicity: 64.5% African American; 14.5% Multi-racial Relationship status:	3-arm RCT 1. 1-session motivational interview 2. 4-session motivational interview 3. Control (received no active intervention but	Type: telephone-administered sexual risk reduction motivational interventions Aim: therapists utilized MI, a client-focused and directive form of	Sexual behavior; Depressive symptoms	Sexual behavior: Participants with no baseline depressive symptoms, in 4-session Tele-MI condition reported fewer episodes of non-condom-protected sex at 3-month follow-up compared to the other treatment arms (IRR =

		MI) intervention efficacy.	NR Intervention 2 - <i>N</i> = 38 Mean age: 53.6±5.7 Gender: 55.3% men; 44.7% women Ethnicity: 15.8% Caucasian; 65.8% African American Relationship status: NR	encouraged to obtain information and support to represent their use of psychosocial services currently available in the community)	counselling, to explore participants' sexual relationship dynamics and increase their readiness to always engage in condom-protected sex Duration: 1 to 4 weeks		0.33, CI =0.12–.94). NS by 6-month follow-up (IRR = 0.97, CI = 0.42–2.26). Participants with lower-baseline depressive symptoms, in 4-Session Tele-MI condition had a greater decrease in noncondom-protected sex acts at both 3- and 6-month follow-up compared to the other treatment conditions (3-month IRR = 0.47, CI = 0.22–1.02; 6-month IRR = 0.04, CI = 0.01–0.11). Participants with higher-baseline depressive symptoms, in 4-Session Tele-MI condition did not differ from other participants on rates of non-condom-protected sex at 3-month (IRR = 0.67, CI = 0.20–2.26) or 6-month follow-up (IRR = 0.77, CI = 0.24–2.53).
Lovejoy et al. (2015), USA	HIV	A secondary data analysis characterizing longitudinal patterns of sexual behavior in HIV-positive older adults enrolled in a randomized control trial of group mental health interventions and assessed the efficacy of	<i>N</i> =295 Mean age: 55.6±4.8 Gender: 67.1% men; 32.9% women Ethnicity: 58% African-American; 29.4% Caucasian Relationship status: NR	3-arm RCT 1. Coping improvement group intervention 2. Interpersonal group intervention 3. control (individual therapy upon request - not an active intervention,	Intervention 1 - Type: coping improvement group intervention Aim: addressing stress and coping related to HIV infection Duration: 12 weeks Intervention 2- Type: interpersonal	Depression; Sexual behavior	Longitudinal sexual behavior: time effect NS: sexual activity (Wald X^2 [3]=7.35, <i>p</i> =0.06), unprotected sex with any partners (Wald X^2 [3]=2.96, <i>p</i> =0.40), and unprotected sex with HIV-negative/ unknown partners (Wald X^2 [3]=4.21, <i>p</i> =0.24).

		psychosocial treatments that targeted depression to reduce sexual risk behavior.		participants seek support within community)	support group intervention Aim: addressing stress and coping related to HIV infection Duration: 12 weeks		Intervention effects on sexual behavior NS: sexual activity (Wald X^2 [6] = 10.62, p = .10), unprotected sex with any partners (Wald X^2 [6] = 10.45, p = .11), unprotected sex with HIV-negative/ unknown partners (Wald X^2 [6] = 6.29, p = .39). Effect of reductions in depressive symptoms on sexual behavior NS: sexual activity (Wald X^2 [3] = 3.11, p = .38), unprotected sex with any partners (Wald X^2 [3] = 5.43, p = .14), and unprotected sex with HIV-negative/ unknown partners (Wald X^2 [3] = 0.91, p = .64). Adoption of riskier sexual behaviors NS relative to intervention condition: with any partner (Wald X^2 [2] = 2.97, p = .23), HIV sexual transmission risk behavior (Wald X^2 [2] = 0.78, p = 0.68).
Lovejoy et al. (2011), USA **	HIV	To assess the efficacy of two telephone delivered motivational interviewing (MI) interventions to reduce risky sexual	Recruited: N = 100 Intervention 1 - N = 39 Mean age: 53.99±4.76 Gender: 51.3% male; 48.6% female	3-arm RCT 1. 1-session motivational interview 2. 4-session motivational interview	Type: telephone-administered sexual risk reduction motivational interventions Aim: therapists	Sexual behavior; readiness to engage in condom protected behaviours	Sexual behavior: participants in the 4-session MI condition engaged in the fewest occasions of unprotected sex at the 3- and 6-month follow-ups, time x

behavior in HIV-infected adults 45-plus years old.	<p>Ethnicity: 61.5% African-American; 15.4% Other/Multi-racial</p> <p>Relationship status: NR</p> <p>Intervention 2 - $N = 38$</p> <p>Mean age: 53.58 ± 5.68</p> <p>Gender: 52.6% male; 44.7% female</p> <p>Ethnicity: 15.8% Caucasian; 65.8% African-American</p> <p>Relationship status: NR</p> <p>Control - $N = 23$</p> <p>Mean age: 53.95 ± 3.96</p> <p>Gender: 60.9% male; 34.8% female</p> <p>Ethnicity: 13% Caucasian; 69.6% African-American; 13% Other/Multi-racial</p> <p>Relationship status: NR</p>	<p>3. Control (received no active intervention but encouraged to obtain information and support to represent their use of psychosocial services currently available in the community)</p>	<p>utilized MI, a client-focused and directive form of counselling, to explore participants' sexual relationship dynamics and increase their readiness to always engage in condom-protected sex</p> <p>Duration: 1 to 4 weeks</p>	<p>condition interaction (Wald $X^2[4]=61.15$, $P<0.001$). Compared to 4-session MI participants, controls had approximately three times as many occasions of unprotected sex at 3-month (OR=3.24, 95% CI[1.79–5.85]) and 6-month (OR=2.70 [1.45–5.00]) follow-up. 1-session MI participants had four times as many unprotected sex acts as 4-session MI participants at 3-month (OR = 3.98 [2.38–6.67]) and 6-month (OR = 4.39 [2.56–7.46]) follow-up. Controls did not differ from 1-session MI participants at the 3-month (OR = 0.81 [0.47–1.41]) or 6-month (OR = 0.61 [0.35–1.09]) assessments. Readiness to use condoms: at 3-month follow-up, 4-session MI participants were more than three times as likely to be in the action stage (ready to use condoms) compared to</p>
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							controls (OR = 3.15 [1.02–9.72]). NS at the 6-month assessment (OR=2.23 [0.78–6.40]). No differences between participants in the 1-session MI and control conditions or the 4- and 1-session MI conditions at 3-month (OR = 2.69 [0.88–8.27] and OR = 1.17 [0.48–2.86], respectively) or 6-month follow-up (OR = 1.87 [0.66–5.30] and OR = 1.19 [0.48–2.99], respectively).
Swartz et al. (2011), USA	Unintended pregnancy and STIs	To evaluate whether a multimedia internet-based program led to increased knowledge regarding preventing unintended pregnancy and STIs, more positive attitudes toward partner and healthcare provider communication and increased self-efficacy and behavioral intentions to engage in risk reduction.	<i>N</i> = 164 Intervention - <i>N</i> = 81 Age: 40-55 Gender: women only Ethnicity: 7.4% Black/African-American; 79% Caucasian; 7.4% Multiracial Relationship status: 43.2% divorced; 27.2% never married Control - <i>N</i> = 83 Age: 40-55 Gender: women only Ethnicity: 16.9% Black/African-American; 72.3% Caucasian	2-arm randomization of participants 1. Treatment group 2. Control (participants with same inclusion criteria directed to a text-based website developed specifically for the study, including: contraceptive methods, STIs, communication and basic reproductive anatomy)	Type: internet-based multimedia program Aim: to reduce the risk of unintended pregnancy and STIs among midlife women Duration: mean use of program was 66.8 minutes (SD = 69.5). Range = 0-340 minutes.	Knowledge; Attitudes; Self-efficacy; Behavioral intentions (intention of using a contraceptive method, preventing an STI, and talking with a sexual partner)	Knowledge: NS Attitudes & beliefs: treatment group performed better at 7-day post-test ($p = .027$, $d=0.35$); 30-day follow-up NS Behavioral intentions: treatment group performed better at 7-day post-test ($p = .015$, $d = 0.39$), and at 30-day follow-up ($p = .039$, $d = 0.33$) Self-efficacy: treatment group performed better at 7-day post-test ($p = .056$, $d=0.3$); 30-day follow-up NS

Relationship status:
48.2% divorced;
31.3% never married

CI = Confidence interval, IRR = Incidence rate ratio, NR = Not recorded, NS = Not significant, RCT = Randomized control trial, $p < 0.05$ = Significant. *NB.* For demographic variables, only the two largest percentages are reported.

Figure 1: Adapted PRISMA flow diagram (Moher, Liberati, Tetzlaff, Altman, & The PRISMA Group, 2009)

