BMJ Open

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Journal:	*BMJ Open*
Manuscript ID	bmjopen-2021-055160
Article Type:	Original research
Date Submitted by the Author:	05-Jul-2021
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Keywords:	PUBLIC HEALTH, Demography < TROPICAL MEDICINE, Infectious disease/HIV < NEUROLOGY

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A decade of Acceptability Research with Adolescents in Africa: Systematic review and evidence map

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Abstract

Interventions aimed at improving adolescent developmental outcomes are more likely to be successful if the young people they target find them acceptable. However, no standard definitions or indicators exist to assess acceptability, acceptability research with adolescents in LMICs is still limited, and no known reviews synthesise the evidence from Africa.

We conducted a systematic review of peer-reviewed studies assessing intervention acceptability with young adults (aged 10-24) in Africa, published between January 2010 and June 2020. This paper maps and qualitatively synthesizes the scope, characteristics, and findings of these studies, including definitions of acceptability, methods used, the type and objectives of interventions assessed, and overall findings on adolescent acceptability.

The review was carried out in line with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA). Key word searches generated 4692 unique records and 55 final eligible studies, assessing 60 interventions. Most studies were conducted in Southern Africa, of which 32 jointly in South Africa and Uganda. The majority of interventions assessed for acceptability could be classified as HIV or HPV vaccine interventions (10), E-health (10), HIV testing interventions (8), support group interventions (7) and contraceptive interventions (6). The objectives of most interventions were linked to SDG3, specifically to HIV and sexual and reproductive health. Acceptability was overall high among these published studies. 22 studies provided reasons for acceptability or lack thereof, some specific to particular types of interventions and others common across intervention types.

Our review exposes considerable scope for future acceptability research and review work. This should include: extending acceptability research beyond the health (and particularly HIV) sector and to regions in Africa where this type of research is still scarce; including adolescents earlier, and potentially throughout the intervention process; further conceptualising the construct of acceptability among adolescents and beyond, and examining the relationship between acceptability and uptake.

Key words: acceptability; adolescents; youth; interventions; Africa

Strengths and limitations of this study

- This is the first review to aggregate and synthesise a decade of acceptability studies with adolescents in Africa, we believe this study makes a valuable contribution to the African and global literature on acceptability.
- This review highlights the overall high level of acceptability of the interventions assessed, and some of the reasons why adolescents and young adults may or may not find interventions acceptable– both specific to particular types of interventions and common across intervention types.
- There was a geographical coverage in our review, particularly in West, Central and North Africa. This could be as a result of confining our search to English language publications which may have excluded some studies from African countries where French is the first language.

Key Questions

What is already known?

- Addressing the developmental needs of adolescents in African countries is critical if the continent is to achieve its sustainable development goals (SDGs).
- Many interventions aimed at strengthening adolescent developmental outcomes have not achieved desired impact, and adolescent involvement is often poorly envisaged and implemented.
- Uptake and effectiveness of interventions is likely to be higher if these interventions are acceptable to adolescent end-users.

What are the new findings?

- Acceptability of interventions assessed in Africa was generally high among adolescents.
- Understanding of the intervention, ease of use, adequate emotional support, autonomy, confidentiality and protection from stigma were key overarching themes explaining why young people found interventions acceptable

What do the new findings imply?

- Intervention developers and implementers across the continent should pay attention to these key aspects of interventions and their delivery.
- It is important to strengthen adolescents' understanding of interventions, involve adolescents early on in intervention development, and engage with the broader context within which adolescent acceptability is shaped.
- There is a need for more acceptability research in important areas for adolescent development beyond (physical) health and, within the health sector, beyond HIV.

Background

Addressing the developmental needs of adolescents in African countries is critical if the continent is to achieve its sustainable development goals (SDGs), and envisaged transformation articulated in the African Union's overarching Agenda 2063 (1, 2). Adolescents make up the largest generation of their age group in history (3),and Sub-Saharan Africa (SSA) accounts for over 20% of the estimated 1.8 billion adolescents and young adults globally (4). Investing in adolescent wellbeing can have positive effects for individuals during adolescence and beyond, as well as potential positive societal effects. Interventions that reduce the consequences of poverty among adolescents, or lead to more positive behaviours, can influence development and wellbeing during adolescence and throughout the life course (5-7). Investment during adolescence can strengthen early childhood investments and reduce the burden of morbidity and mortality in adulthood (8). Moreover, it has been argued that investment in adolescents can help realize the 'demographic dividend' (9, 10), and reduce generational inequalities (11).

Substantial investment has been made globally in adolescent interventions focusing on areas such as sexual and reproductive health, nutrition, uptake of vaccines and prevention of substance abuse (12). Unfortunately these interventions have not always recorded impressive impact (13). Data from both high-income countries (HICs) and low- and middle-income countries (LMICs) reveal that many interventions focusing on adolescents are fragmented, poorly designed, and unequal in quality (14). One reason for this may be an insufficient understanding of the particular nature of adolescence (15).

Adolescence is a critical period characterised by rapid development of the physical, cognitive, social, and emotional capabilities that are instrumental across their life-course (3). Adolescence is also a time of gathering independence and the pathways to learning and experiencing such independence are varied, with experiential learning playing a key role. The rapid growth associated with this phase and its influences on behaviour need to be well understood in order to design timely and effective interventions (16).

Interventions may also fail to sufficiently consider the diverse environments in which adolescents live, that may shape their decisions and behaviour (17). This may lead to interveners missing important factors that, if unaddressed, will prevent the intervention from having the desired impact. Additionally, program implementers may lack the specialized skills necessary for delivering and sustaining these interventions (12). Adult interventions may not translate directly for adolescent audiences and programme adjustments may be inadequate.

Since most interventions seek to effect adolescent behavioural change, many of the obstacles to uptake and effectiveness could be addressed by affording sufficient importance to the perspectives and participation of adolescents themselves. When adolescents feel coerced to engage in a particular behaviour or accept interventions that they don't identify with, they are more likely to resist the message of the proposed intervention, or to stop participating altogether (18). Instead, interventions that are

acceptable to adolescent end-users are likely to have higher social validity (19), uptake and effectiveness (20, 21).

However, adolescent involvement and input in intervention design has been varied, and models of adolescent inclusion have been poorly envisaged and implemented. There is still a relatively low number of acceptability studies among adolescents in LMICs and specifically in Africa, particularly beyond the health sector (19, 20). To our knowledge no existing reviews comprehensively map the extant body of acceptability research in Africa and aggregate the evidence emerging from these studies. Furthermore, there is no clear and standard definition of acceptability (20) in Africa and beyond. This in turn raises several methodological challenges when setting out to assess acceptability, including the choice of measurement frameworks and tools (20). It also highlights the scope for further conceptualisation of this construct, particularly in specific populations and geographical regions.

We conducted a systematic review to identify studies that conducted primary research with adolescents and young adults (10-24) in Africa over the past decade (January 2010-June 2020), to assess the acceptability of interventions aimed at positively influencing their developmental outcomes. This paper maps and qualitatively synthesizes the scope, characteristics, and overall findings of studies identified. This includes evidence addressing the questions of whether and how the construct of acceptability is conceptualised and defined within these studies, the methods and indicators used, the type and key objectives of interventions assessed, as well as evidence on what adolescents find acceptable and why. Based on these findings, we aim to discuss implications for future adolescent-focused interventions in Africa and identify gaps for future acceptability research with this population.

Methods

Search strategy

The systematic review was carried out in line with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA). We used the PICO (Population, Intervention, Comparison, Outcome) criteria (22) to help determine eligibility criteria for inclusion develop the search strategy and composite search terms developed (see Table S1). We searched 8 online databases (listed in Table S1), covering a wide range of behavioural science research, and searched the reference lists of eligible papers.

Study selection and data extraction

Papers were selected based on the following inclusion criteria: if they (i) reported primary research assessing acceptability (based on the authors' definition of the study or findings) of one or more intervention(s) with adolescents and young adults 10-24; (ii) assessed acceptability of intervention(s) aimed at positively influencing one or more

development outcome(s), as defined by SDG indicators; (iii) reported on research conducted in Africa; (iv) were in the English Language; (v) were peer-reviewed and; (vi) were published between 1st January 2010 and 30th June 2020. We did not include limiters for study design or methodological tools, type of intervention or sector, or type of developmental outcome the intervention intended to influence. To be as inclusive as possible, we included studies that worked with broader samples (e.g., youth and adults) but disaggregated the results and reported findings specifically for the age group of interest (10-24).

We imported all references from the online databases into Endnote, where duplicates were identified and removed. Abstracts were reviewed independently by the two first authors to determine relevance. Full text of potentially eligible studies were retrieved and independently examined by the same two authors; areas of disagreement or lack of clarity were resolved through discussion by the two authors and – where necessary – the assessment of a third author. Reasons for exclusion of each paper not deemed eligible were recorded in an excel spread sheet. We developed a detailed extraction sheet, using Excel software, to extract key characteristics and findings of eligible papers. For reliability, the information for each paper was extracted separately by at least two of the first three authors and differences were resolved through discussion among the authors.

Patient and public involvement

Patients and the public were not involved in the preparation of this study.

Results

Eligible studies included in the review

Figure 1 presents the PRISMA flow diagram describing the process of study selection and reasons for study exclusion. A total of 4692 titles and abstracts were screened after removing duplicates, 278 articles were subjected to a full-text review, and a final 55 studies were considered eligible for inclusion in the review.

Figure 1 here:

Study characteristics: publication year, location and sample

Below we present a summary of key characteristics of the 55 eligible studies included in our review. More than half of the papers were published between 2018-2020 with 22% of the papers published in 2019, as shown in the supplementary figure S1.

Fig.2 below provides a visual representation of the location of studies on the continent. There is a clear concentration of acceptability studies in South and East Africa, with approximately half of identified studies conducted in South Africa (19) and Uganda (13). Only seven studies were from West and Central Africa and only one from North Africa.

Figure 2 here:

The supplementary table S2 provides information on study characteristics and overall findings for the entire list of eligible studies, and by each type of intervention category

(as indicated below) in separate sheets. Most (41) study samples included male and female participants, while 11 studies worked only with females and three with males only. 44 studies worked with samples that fell entirely within the specified age range (10-24), while 11 included studies worked with broader samples (e.g., youth and adults) but disaggregated the results and reported findings specifically for the age group of interest. To be as inclusive as possible, we included 10 studies that did not clearly specify the exact age range of participants, but for which available information indicated that the sample would have been entirely or almost entirely within this range (e.g. secondary school and university students (23-28) or where sample descriptive data indicated a sample consisting almost entirely of participants 24 or younger (29-31).

While our inclusion criteria focused on primary acceptability research with adolescents and young adults, it should be noted that 25 studies also collected acceptability data from other stakeholders. These include caregivers or other family members (32-40), teachers, facilitators (26, 41, 42) , community leaders or gate keepers, (28, 43), peer mentors, service providers and healthcare workers (29, 44-51) .

Types and objectives of interventions assessed for acceptability.

We categorised interventions assessed for acceptability both by type of intervention, based on their key components (see Figure 3), and stated objectives of the interventions (see Figure 4). In terms of type of intervention, interventions were classified as HIV or HPV vaccine interventions (10), E-health (10), HIV testing interventions (8), support group interventions (7), contraceptive interventions (6), voluntary medical male circumcision programs (VMMC) (4), school-based sexual and reproductive health education (4), economic support programs (4) and pre-exposure prophylaxis (PrEP) (2). Five studies did not fit into the above intervention categories and were grouped as 'other'; they consisted respectively of nutritional therapy, a psychosocial - home based care intervention, a counselling support intervention to address substance abuse, cervical cancer screening and a rectal microbicide intervention for HIV prevention. It should be noted that two of the studies reviewed assessed more than one intervention (45, 52) (3 and 4 respectively), so that the total number of interventions assessed for acceptability was 60.

Figure 3 here:

More detail on intervention sub-types is included in Table S2. For example, E-health interventions included game based (1), SMS based (7) and internet-based (2) programs. All 7 support group interventions provided psychosocial or educational support related to HIV, and 5 worked only with young adults living with HIV. One group intervention was delivered through both a social media platform and in-person meetings (53), one was a family based support intervention with adolescent-parent dyads (33), four were linked to public healthcare facilities (42, 47, 54, 55) and one was a community intervention (43).

The primary objectives of most interventions were focused on HIV- or sexual and reproductive health-related outcomes (see Figure 4): 19 primarily aimed to prevent new HIV infections, ten to prevent HPV infection, nine to increase HIV treatment adherence and retention in care, eight to increase the uptake of HIV testing, eight aimed at increasing contraceptive uptake and reducing early childbearing and six provided psychosocial support for adolescents living with HIV (42).

The objectives of almost all interventions were therefore linked to indicators within SDG3 (ensuring healthy lives and promoting well-being). However, one study could also be linked to SDG2 (food security and improved nutrition), 6 to SDG4 (inclusive and equitable quality education), 8 to SDG5 (gender equality) and 1 to SDG6 (access to water and sanitation).

Figure 4 here:

Definitions and conceptual frameworks for acceptability

Only seven of the 55 reviewed studies provided an explicit definition of acceptability and only six used a conceptual framework (as indicated in Table S2). Three definitions focused on the preference for or willingness to use the intervention: Tonen-Wolyec et al (2019) defined acceptability as consenting to and using the (HIV self-testing) intervention; Smith, Wallace (30) defined it as the preference for using the (HIV self-testing) device [33]; and Katahoire et al (2013) defined acceptability as the willingness or reluctance to use and complete the intervention (in this case the 3 doses of HPV vaccine) (56).

Two definitions focused mainly on responses to the intervention. MacCarthy et al (2020) (48) referred to a definition and framework developed by Sekhon et al (2017)(20) and defined acceptability as the cognitive and emotional responses to an intervention (20, 48). Parker et al (2013) (42) defined acceptability as how the intended individual recipients react to a program, guided by the Bowen feasibility framework (57). A further two studies conceptualized acceptability as an implementation outcome and focused on value, appeal and likeability: Kibel et al (2019)(58) referred to the perception among stakeholders that a certain element of the program was valued, agreeable, or satisfactory, while Sabben et al (2019)(34) defined acceptability as appeal, relevance, value, usability, and understandability, based on the Technology Acceptance Model's (TAM) framework (59).

Three studies referred to a conceptual framework but did not provide an explicit definition of acceptability. In their assessment of individual and environmental barriers and facilitators related to use of a school-based contraception clinic, Khoza et al (2019) referred to the social ecological framework (60). Sayles et al's (2010) study was guided by value-expectancy and social marketing theories (61); the authors investigated vaccine attitudes, normative vaccine beliefs, and perceived risk and severity of HIV as determinants of HIV vaccine uptake. Turiho et al's (2017) study used the symbolic interactionism theory (62) and some aspects of the Health Beliefs Model (HBM) to

explain how community members' perceptions and their interaction shape vaccine acceptability.

Study design, methods and indicators

Sixteen studies included in this review (29%) assessed 'anticipated' or prospective acceptability among adolescents who had not (yet) received the intervention (20). 18 studies (33%) assessed acceptability concurrently, during the delivery of the intervention, while 14 (25%) assessed acceptability post-intervention, retrospectively. The remaining seven (13%) of the studies assessed interventions prospectively and retrospectively; among these, two studies worked with separate groups of adolescents who had received and not yet received the intervention (52, 63), while the remaining 5 interviewed adolescents at two different stages of the intervention (40, 44, 55, 64, 65). Five studies involved adolescents in the study design (43, 50, 53, 55, 65).

20 studies described their methodology as solely qualitative, 18 as quantitative and 17 as mixed methods. 11 of the qualitative studies used only focus group discussions (FGDS), 7 used only in-depth interviews (IDIs) and 2 used both methods. Most of the quantitative studies (15) employed structured survey questionnaires. The mixed methods studies combined FGDs or IDIs with survey questionnaires, online surveys and evaluation reports.

As detailed in the supplementary table S2, a wide range of questions and indicators were used to measure acceptability. None of the studies used a standardized previously validated instrument, although two papers drew from existing instruments (66, 67). The majority of questions asked across studies covered participants' overall perceptions and experience of the intervention, willingness to use the intervention, understanding of the intervention, barriers and facilitators of access and use, the perceived effectiveness of the intervention and willingness to recommend or distribute it to others.

Acceptability findings

Overall, acceptability of interventions assessed was high. Of the 55 studies, 30 assessed acceptability quantitatively and reported on the proportion of young adults in the sample that found the intervention acceptable. While some studies quantified acceptability through a single percentage, based on one question or indicator, a number of studies reported a range, based on multiple questions or indicators. One of the reviewed studies reported 100% acceptability (33), while acceptability ranged from 64% - 100% in 25 studies and 46% - 61% in 2 studies (27, 52, 68, 69). Only two studies clearly reported acceptability below 50%: at 37% for a contraceptive intervention in Tanzania (70) and 27% for an HPV vaccine study in Morocco (71). Reasons given for low acceptability of the contraceptive intervention were that adolescents and their peers were too young to be sensitized about condoms, that condoms would not be used properly and that using contraception was a sin (70). Reasons were not provided by adolescents for the Moroccan study; however, in quantitative analysis, older age, female gender, studying at a public (versus

private) school and lower educational attainment were associated with lower odds of acceptability for the HPV vaccine (71).

The remaining 25 studies did not quantify acceptability. However, the authors of two of these studies reported that adolescents found the interventions to be unacceptable, based on their overall findings. One study in South Africa assessed contraceptive interventions (32); a key reason for low acceptability was the belief that a school-based contraceptive clinic (SBCC) could promote promiscuity by sending a message that 'teenage sex was acceptable' and making contraceptives easily accessible (32). The second study assessed a psychosocial home based care intervention in Tanzania (72), which adolescent participants felt did not align well with their expectations. They believed the intervention to be more relevant to their caregivers and were disappointed in the lack of financial support in a context of widespread poverty (72).

Findings of the remaining 51 studies overall indicated high levels of acceptability. Some of these studies also provided various reasons as to why adolescents found the interventions acceptable (n=22) or (for a minority of adolescents) not acceptable (n=20). These are presented in Table 1, by type of intervention, for studies with both low and high overall acceptability. The main reasons e-Health interventions were acceptable to adolescents were: knowledge gained from the intervention regarding their sexual health (34, 65), the privacy these interventions provided (23, 48) and knowing how to make use of the intervention (25, 34). Adolescents who instead did not find these interventions acceptable felt that the content was not culturally appropriate (23, 25, 65), highlighted technological glitches (48, 50, 65) or were concerned with inclusiveness where, for example, not all the young adults had access to a necessary device or risked unintended disclosure of private information when sharing devices (65, 73).

Confidentiality, appropriateness, privacy and decision-making autonomy were among the reasons adolescents found HIV testing interventions (including self-testing and testing in schools) acceptable (42, 44, 53, 64, 74). Fear of the procedure, concerns with the cost and validity of the test, and inadequate emotional support were reasons given for lack of acceptability (64, 75, 76). Support group interventions were considered acceptable because of the emotional support provided and because young adults found the groups to be empowering and were able to discuss HIV-related issues in a stigma-free environment (42, 47, 53, 55).

Knowledge was a key reason for high vaccine acceptability for both HPV and HIV vaccine interventions. For example, adolescents' understanding that HPV vaccines could prevent cervical cancer and HIV made them more likely to accept the interventions (63). Conversely, lack of knowledge or understanding of the intervention was linked to low acceptability (36, 52, 56). Other reasons given for acceptability were greater female autonomy and agency to protect themselves, in the event of sexual violence or transactional sex, and encouragement of peers (36, 58, 63). On the other hand, perceived cost, myths and distrust of vaccine providers, and fear of side effects, were themes raised to explain low acceptability (61, 77).

Reasons for acceptability of economic support interventions included financial autonomy (78) and the freedom to decide how to use cash transfers (28). However, concerns around the process of selecting which individuals or households were to receive transfers, as well as inclusion, sustainability and effects on social relations and social equity within the community (38, 78), were factors that threatened acceptability.

Table 1: Reasons provided by adolescents for acceptability and unacceptability of interventions, by type of intervention.

Type of intervention	Reasons given for acceptability	Reasons given for unacceptability
eHealth	Knowledge provided on sexual health and HIV [27,37] Privacy [25,51] Increased self-efficacy to manage risky situations[37] Ease of use [37] Supportive mentors [32] Freedom to talk openly to mentors about HIV status and disclosure [32]	Visual content considered not culturally appropriate [25] Conservative views about certain topics discussed (e.g., oral sex) [27,70] Concerns around access and inclusiveness, as not all youth owned devices [70,78] Fear of accidental disclosure of confidential information through device-sharing [78] Technical glitches with devices [51,53,70]
Vaccines	Protection from HPV in the case of sexual abuse or transactional sex [39] Protection from HIV infection when the transmission risk is out of an individual's control [48,63] Desire to have unprotected sex for child-bearing (women on HIV-vaccine) [63] Being able to have unprotected sex and multiple sexual partners (male adolescents on HIV vaccine)[63] Protection in serodiscordant relationships while avoiding the HIV stigma and costs related to buying condoms (male adolescents on HIV vaccine) [48]	Distrust of government and scientists [63] Association of vaccine uptake with promiscuity [63] Fear of HIV testing and HIV stigma [63] Cost of vaccine [63] Fear of vaccine side effects [31,54,63,68] Fear of injection [31] Lack of knowledge about vaccine and cervical cancer [39,58,67]
HIV testing	Confidentiality of HIV self-testing at schools [47,81 79] Ease of use of HIV self-test [47,81] Fast results of self-test[47] Ability to test independently with self-test [69] Opportunity to know HIV status, for peace of mind and to plan for the future (provider-initiated testing) [42] Lower waiting time, less distance to facility, and friendlier staff at mobile (versus 'conventional') clinic[72]	Concern with validity of HIVST self-test kit results [69,81] Costs of HIV test kit [69] Lack of emotional support with self-test[69,81] Fear of the procedure (finger prick) [33 80] Belief that school is not the right place for HIV testing [79] Lack of privacy and risk of stigma through school testing [79]
Support group	Emotional and social support provided [45,50,55,57] Knowledge and skills provided [45,57] Enjoyed participating [55]	

	Stigma free environment [56] Confidential space to openly discuss sexual health and behavior [45,55] Greater decision-making autonomy to negotiate safer sexual relationships [45]	
SRH education	Increased knowledge on sexual and reproductive health [26,44] Supportive teachers at youth clubs [44] Girls more comfortable attending school during menstruation [26]	Conservative views about certain topics discussed (linked to sexual intercourse) [44]
VMMC	Material support provided during the intervention (e.g. food, shelter and security) [60] Knowledge gained through participation [60]	Penile swelling after removal and transient discoloration of inner foreskin [82]
Economic support	Increased school retention [30,41,83] Financial autonomy [30,83] Easy access to cash transfer [30]	Concerns with sustainability and impact of transfer termination [83] Exclusion of certain households or individuals in the community from receiving transfers [30,41] Perception that selection process was unfair [41] Lack of interest in family planning services accessible through (conditional) benefit cards [84]
Contraception	Ease of use of self-injectable and female contraceptives [71,85] Privacy and convenience of self-injectable contraceptives[85] Female autonomy to control female contraceptive use[48,71] Condom fatigue and HIV fear [48]	Conservative views on condom use and messaging (e.g. using condoms is a sin, condoms may encourage early sexual debut) [35,75] Belief that adolescents are too young for condom promotion and sexual activity [3] Fear of needles and self-injection for injectable contraceptives [85] Concerns with not being able to use condoms properly [75] Belief that condoms cause AIDS and other diseases [75] Concerns about the effect of cervical contraceptive being in the body for a long time [71] Concern with stigma[48] Waiting times at health facilities [48]
PrEP	Prevents transmission in serodiscordant couples[48] Easy to use [48]	Conflict with traditional methods and beliefs[48] Fear of side effects [48]
Psychosocial home-based care		Program more relevant to caregiver versus adolescent needs [77] Lack of financial support in a context of widespread poverty [77]

Discussion

Findings of this review indicate two positive trends. The first is an increase, over the past decade, in the number of acceptability studies with adolescents on the continent. Though numbers are overall low, this could signal increasing recognition of the value of engaging young people when designing and implementing interventions intended for them. The second is that acceptability of interventions assessed was generally high. This suggests an overall good alignment of interventions with adolescent needs and preferences. However, we should also be aware of the possibility of publication bias (79, 80), as research showing less favourable acceptability results may be less likely to be written up and published. A key limitation of this review is that we did not include grey

literature, given available resources, the review's already broad scope, and to ensure a minimum quality of studies included. We also did not conduct a quality assessment, given the heterogeneity of interventions assessed and study designs; however, we note that this is not a requirement of a mapping review, which aims to summarise available evidence in an area versus focus on a particular research question (81-83).

Acceptability findings

Despite the diversity of intervention settings, types of interventions and modes of delivery across studies, several common themes emerged from reasons given by adolescents to explain why specific interventions were acceptable to them. These included the product or intervention being easy to use, knowledge of the intervention or knowledge provided by the intervention, the intervention allowing for (greater) autonomy, adolescents feeling supported while participating in the intervention and feeling assured that their privacy and confidential information would be protected. Although reasons for 'unacceptability' were more diverse, overarching themes could also be identified among these, for example: conservative views about the intervention or its content; concerns around intervention costs, access and inclusiveness; fear of pain and side effects (for biomedical interventions); stigma, myths or distrust; and lack of knowledge or support. While certain drivers of unacceptability mirrored those of acceptability (e.g. knowledge and support), these drivers mostly differed, suggesting that acceptability and unacceptability are not necessarily represented by one continuum.

These findings suggest that intervention developers and implementers across the continent should pay attention to key aspects of interventions and their delivery that adolescents clearly care about, and seek to address these from the intervention development phase. They should ensure that adolescents are provided with adequate knowledge, training and resources to properly understand the intervention and feel confident in their ability to use it, that they have access to sufficient logistical and emotional support while participating, and that their confidential information is protected, so that they are in turn protected from much-feared stigma and other potential negative social consequences. Moreover, they should bear in mind that adolescents value autonomy and that this has a gender dimension. Autonomy relates not only to being able to choose to participate in and use an intervention, but also being empowered by the knowledge it may provide and the greater control it may afford young people (particularly young women) in managing high risk situations and unequal relationships.

It may also be worth paying particular attention to acceptability findings for specific types of interventions, given current African and global public health challenges. For example, the role of digital technology in achieving many of the SDGs is well documented

(84) and merits particular attention in the context of the Covid-19 pandemic (85, 86). While young people remain the most connected population group to digital platforms(87), there is a clear digital divide, as more than 60% of young adults in Africa do not have access to internet (88, 89). Findings of this review show overall high acceptability of e-Health interventions (34, 50), as adolescents highlighted opportunities presented by digital technology, for example by reducing the cost of in-person interaction (53). Yet concerns raised around connectivity issues, lack of access to devices and unintended disclosure of confidential information (53, 73) represent challenges for the acceptability, equitable access and effectiveness of e-Health programs. It is therefore important for intervention providers to assess these challenges early on, and to explore ways of potentially increasing access to devices or technologies within the intervention itself or by supporting concurrent initiatives (65).

Low acceptability of several interventions aimed at increasing contraceptive use and HIV testing also merits particular attention, since HIV transmission and relatively low rates of HIV testing and linkage to antiretroviral therapy (ART) remain a concern among young adults (90, 91). Several studies included in this review highlighted, for example, adolescents' fear of stigma and lack of privacy regarding HIV testing interventions in schools (74), concerns about not being able to properly perform oral HIV testing on their own (76) and conservative views of contraceptive promotion and use (32, 70). These perspectives are likely shaped by inadequate understanding of interventions, but also by social norms surrounding sexuality and contraception within adolescents' homes, schools and communities (92, 93). Also, fear of vaccines and their side effects (94, 95) are important to note and address, in relation not only to HPV prevention, but also to the current Covid-19 vaccine rollout.

All of the above examples highlight the importance of strengthening adolescents' knowledge of interventions and how to interact with them, but also of understanding and engaging with the broader context within which adolescent acceptability is shaped (92). One way to achieve this is to involve adolescents (preferably potential end-users) early in the design and planning phase of the intervention and – if possible - at various stages of the intervention life cycle. Yet, as indicated above, less than half of the studies in this review (42%) assessed prospective acceptability and very few studies involved adolescents in the study design and/or at multiple phases of the intervention. There is clearly potential to allow for more meaningful and consistent adolescent engagement, if young people are to have a stronger role in shaping the development, adaptation and scale up of interventions (20).

A second key approach would be to engage early on and assess acceptability with other stakeholders who are central to an intervention being well-targeted, well-implemented and accepted by adolescents and the broader community. These may include intervention implementers and facilitators, but also caregivers, partners and peers, teachers and community leaders. As noted above, 25 studies in this review also assessed acceptability of other types of stakeholders. Future review analyses and acceptability

studies could further focus on acceptability among these groups of individuals, and its implications for adolescent acceptability and intervention success.

Gaps and key areas for future research

Our review highlights several key gaps and related areas for future intervention acceptability research. First, there appears to be a gap in geographical coverage, particularly in West, Central and North Africa. However, we note that confining our search to English language publications may have excluded some studies from African countries where French is the first language. Given that adolescent needs and preferences are likely to differ across areas with very different social and cultural norms and faith contexts (96), we cannot simply extrapolate acceptability findings to other countries or communities across the continent.

Second, there is clearly scope for more acceptability research in important areas for adolescent development beyond (physical) health and, within the health sector, beyond HIV. As important as reducing HIV transmission and increasing testing and treatment adherence may be in this population (90, 91), they are clearly not the only dimensions of adolescent health and broader wellbeing that merit attention and investment. There is a glaring lack of acceptability studies in areas of adolescent development beyond SDG 3. These include education access and outcomes, employment opportunities, access to water and other services, gender equality and protection from violence, social protection and mental health (97).

The focus on specific types of interventions likely reflects, to a large extent, global health funding and research priorities over the past decades. There has been a considerable amount of international aid dedicated to addressing HIV (98, 99) and particular concern around the acceptability of HIV interventions. Moreover, the concentration of acceptability research in specific countries in Africa is likely a reflection of disparities in independent research infrastructure and capacity across the continent (100, 101). It would also seem that 'acceptability' is a concept and term that has gained traction primarily within the health sector (20). The extension of acceptability research to geographical and developmental areas where it is currently scarce therefore cannot be addressed solely by decisions of individual research teams, but will to some extent require a change in global health and funding priorities, and the 'adoption' of acceptability research by other sectors.

A third gap highlighted by this review is the considerable scope to further conceptualise the construct of acceptability, by more clearly defining it and identifying its key components. Our review reinforced the absence of a clear or standard definition of acceptability, or common tools and indicators. In fact, the large majority of papers included in this review (48) referred to the concept of acceptability without defining it at all, requiring the reader to review the questions and indicators used to gain some understanding of how the construct of acceptability was conceptualised and operationalized. As highlighted by other authors, this lack of common definitions and

frameworks makes the selection of measurement indicators for empirical enquiry in this area more difficult and the comparability of acceptability results challenging (102, 103). There have been recent efforts to address these gaps; in particular, Sekhon and colleagues' theoretical framework for acceptability (TFA), published in 2017 (20), has made a valuable contribution to the scarce conceptual literature in the field. However, there is still much work to be done to apply and test the framework in specific populations. For example, its relevance and completeness in investigating acceptability among adolescents, in less-resourced settings and beyond the (biomedical) health sector is still unclear. Also unclear is the important link between intervention acceptability and uptake, considering that willingness to use the intervention is often included among questions used to assess acceptability (see table S2). Lastly, it is encouraging to note that a relatively large number of studies in our review used mixed methods approaches to assess acceptability; however, there is clearly still scope to employ and combine more innovative methodologies (55, 65).

Conclusion

As the first systematic review to aggregate and synthesise a decade of acceptability studies with adolescents in Africa, we believe this study makes a valuable contribution to the African and global literature on acceptability. It highlights the overall high level of acceptability of the interventions assessed, and some of the reasons why adolescents and young adults may or may not find interventions acceptable– both specific to particular types of interventions and common across intervention types.

However, it also exposes considerable scope for future acceptability research and review work, to extend and strengthen the existing body of evidence. This should include: extending acceptability research beyond the health (and particularly HIV) sector and to countries in Africa where this type of research is still scarce; including adolescents and other potential key stakeholders earlier, and potentially throughout, the intervention process; further conceptualising the construct of acceptability; and investigating the relationship between acceptability and intervention uptake and success.

Data availability statement

Data are available in a public, open-access repository. All data relevant to the study are included in the article or uploaded as supplementary information.

Ethics statements

Patient consent for publication

Not required.

Acknowledgements: ODS, MC, GH, CD, LC and LS receive funding from the UKRI GCRF Accelerating Achievement for Africa's Adolescents (Accelerate) Hub (Grant Ref: ES/S008101/1).

Contributors: ODS and MC were involved in the conceptualisation of the paper, the data extraction and analysis, and the manuscript writing; GH was part of the data extraction and analysis, and reviewed and revised the manuscript; CD reviewed and revised the manuscript; LC reviewed and revised the manuscript; and LS reviewed and revised the manuscript. All authors read, reviewed and approved the final manuscript.

Competing interests: None declared.

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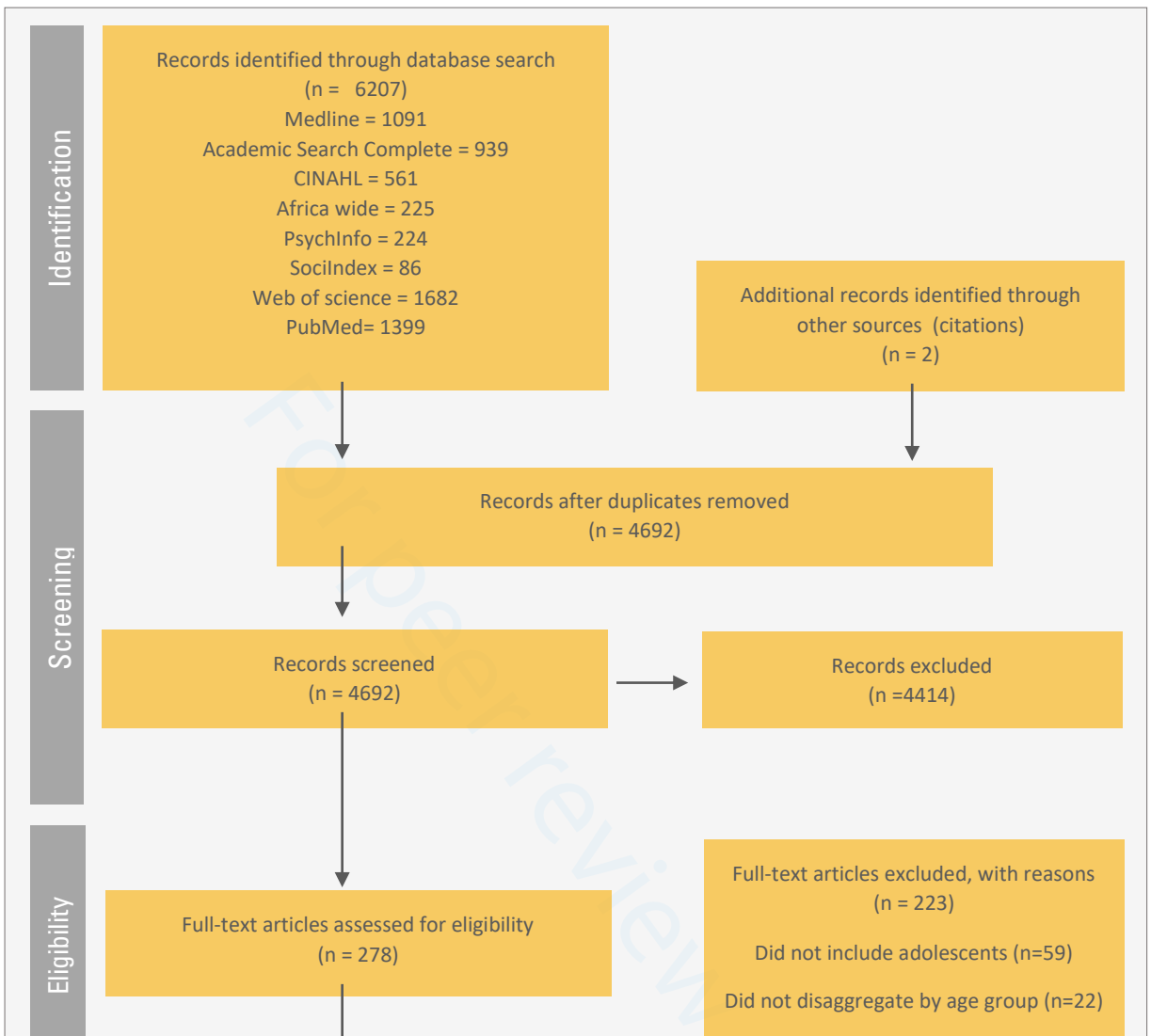

Figure 1: The PRISMA flow diagram describing the process of study selection.

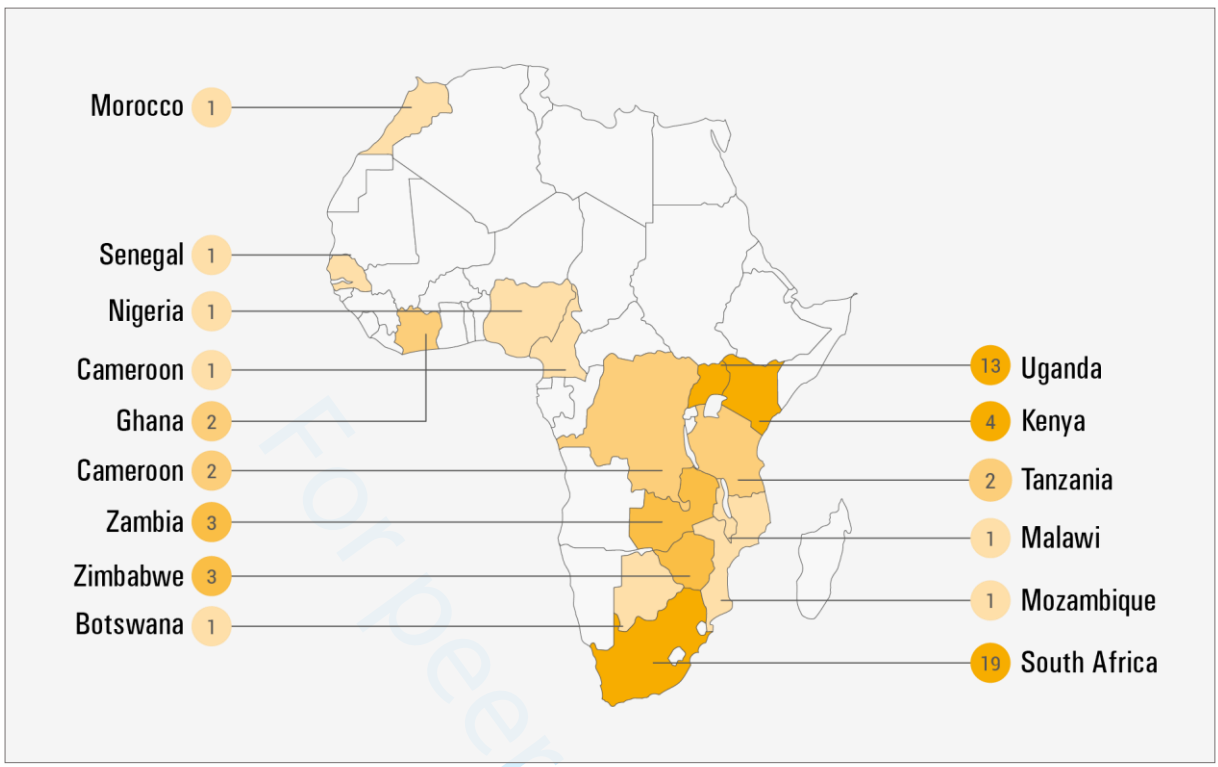

Figure 2: Study Location

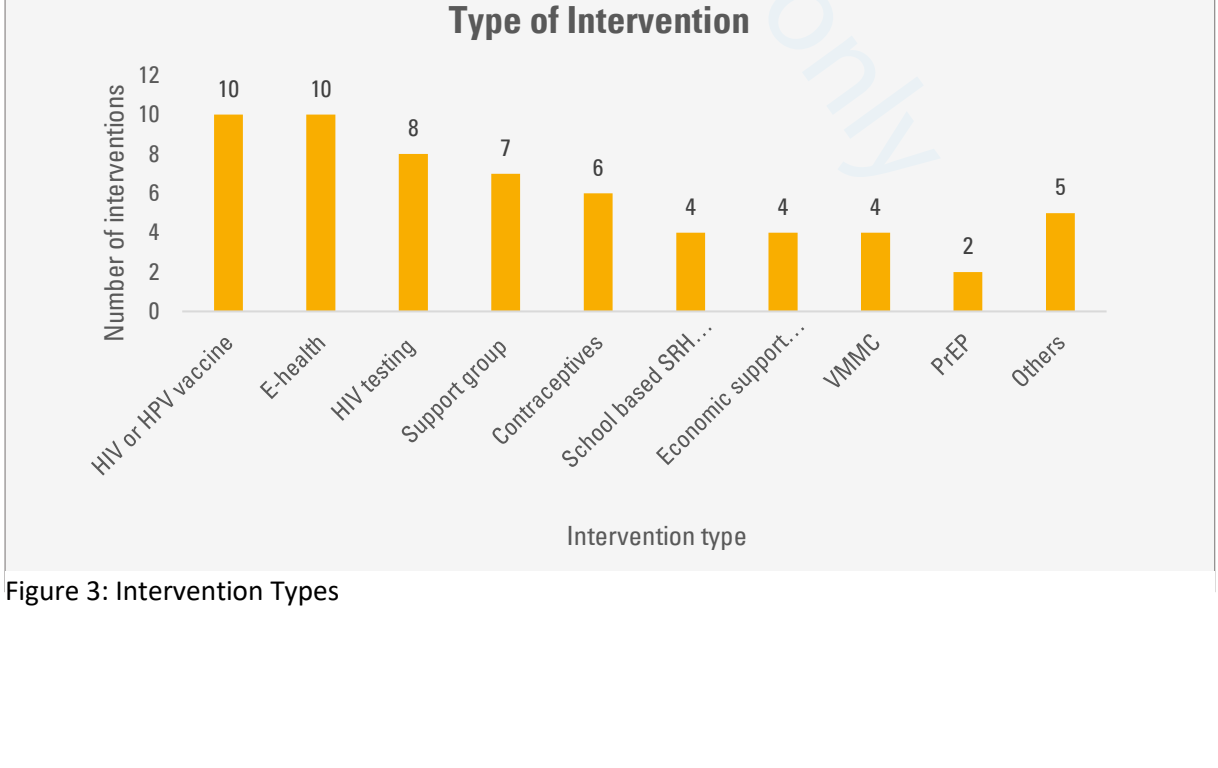

Figure 3: Intervention Types

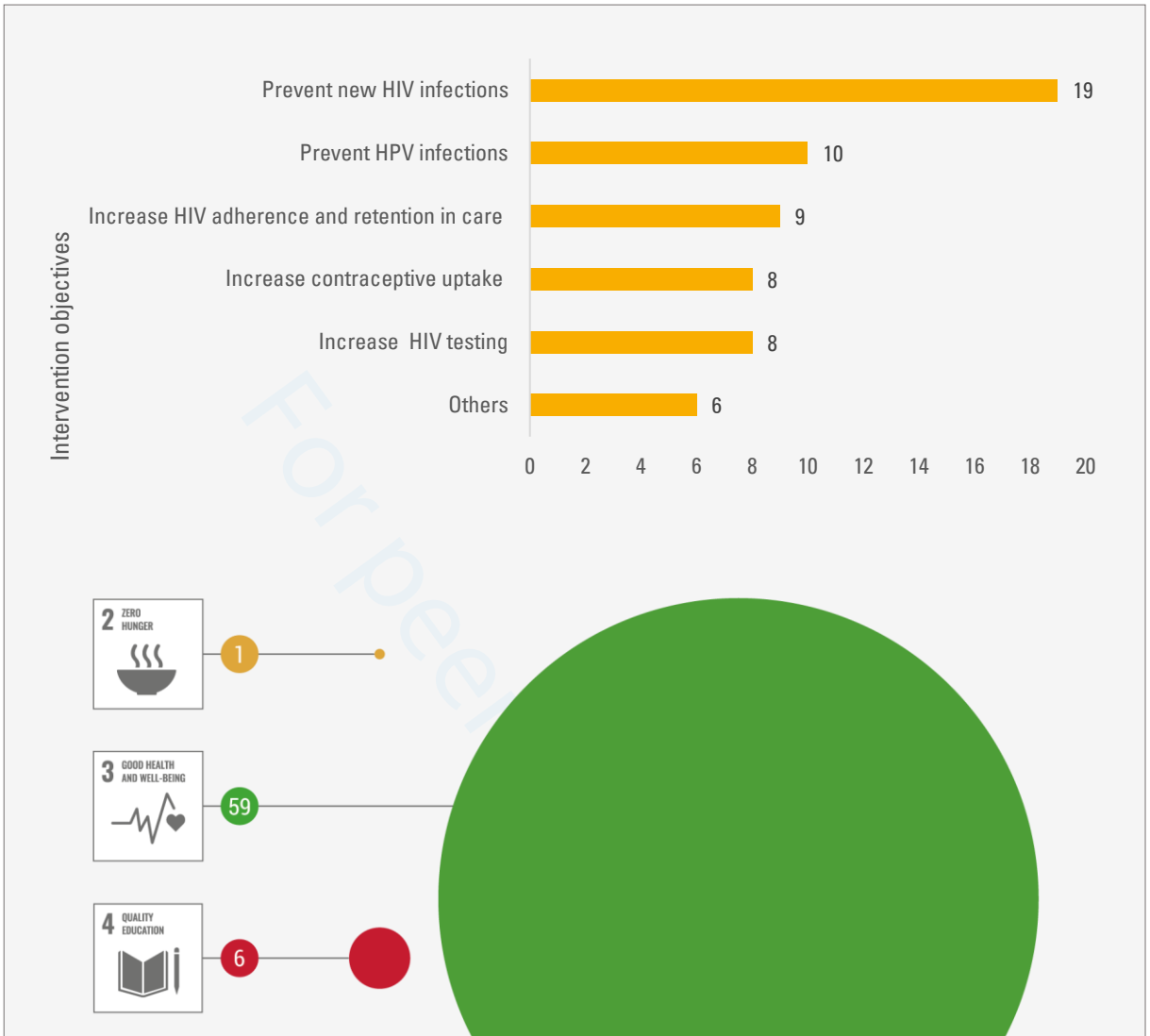

Figure 4: Intervention objectives and number of interventions linked to each SDG

Table S1. Systematic Review Search Strategy

Search criteria (based on the Cochrane Collaboration's PICO criteria)	**Population:** adolescents or youth 10–24 years, living in Africa **Intervention:** primary research to determine adolescent and youth acceptability of one or more interventions aimed at improving their developmental outcomes (as per SDG indicators) **Comparison:** N/A **Outcomes:** adolescent acceptability findings, including: proportion of adolescents that find an intervention acceptable; information on what adolescents consider acceptable or not; reasons given for acceptability or lack of acceptability **Study or intervention design:** all types of study designs; no limiters on methodology
Search terms used for PubMed	Adolescents or Youth ((((youth[Title/Abstract] OR young person[Title/Abstract] OR young people[Title/Abstract] OR young women[Title/Abstract] OR young men[Title/Abstract] OR child*[Title/Abstract] OR adoles*[Title/Abstract] OR young adult[Title/Abstract] OR teen*)[Title/Abstract]) Acceptability ((acceptable[Title/Abstract] OR acceptability[Title/Abstract] OR co-creat*[Title/Abstract] OR adolescent engagement[Title/Abstract] OR youth engagement[Title/Abstract] OR teen* engagement[Title/Abstract] OR participant engagement[Title/Abstract] OR adolescent participation[Title/Abstract] OR youth participation[Title/Abstract] OR teen* participation[Title/Abstract] OR participant input[Title/Abstract] OR adolescent input[Title/Abstract] OR youth input[Title/Abstract] OR teen* input[Title/Abstract] OR participant feedback[Title/Abstract] OR adolescent feedback[Title/Abstract] OR youth feedback[Title/Abstract] OR teen* feedback[Title/Abstract] OR participant consultation[Title/Abstract] OR adolescent consultation[Title/Abstract] OR youth consultation[Title/Abstract] OR teen* consultation[Title/Abstract] OR participant advisory[Title/Abstract] OR adolescent advisory[Title/Abstract] OR youth advisory[Title/Abstract] OR teen* advisory[Title/Abstract] OR participatory research)[Title/Abstract]))

Search terms used for Web of Science	Adolescents of Youth: TOPIC: ((youth OR "young person" OR "young people" OR "young women" OR "young men" OR "child*" OR "adoles*" OR "young adult" OR "teen*")) Acceptability: TOPIC: ((acceptable OR acceptability OR co-creat* OR "adolescent engagement" OR "youth engagement" OR "teen* engagement" OR "participant engagement" OR "adolescent participation" OR "youth participation" OR "teen* participation" OR "participant input" OR "adolescent input" OR "youth input" OR "teen* input" OR "participant feedback" OR "adolescent feedback" OR "youth feedback" OR "teen* feedback" OR "participant consultation" OR "adolescent consultation" OR "youth consultation" OR "teen* consultation" OR "participant advisory" OR "adolescent advisory" OR "youth advisory" OR "teen* advisory" OR "participatory research"))
Search terms for EBSCOhost-linked databases	Adolescents or Youth: AB (youth OR “young person” OR “young people” OR “young women” OR “young men” OR “child*” OR “adoles*” OR “young adult” OR “teen*”) AcceptabilityAB (acceptable OR acceptability OR co-creat* OR “adolescent engagement” OR “youth engagement” OR “teen* engagement” OR “participant engagement” OR “adolescent participation” OR “youth participation” OR “teen* participation” OR “participant input” OR “adolescent input” OR “youth input” OR “teen* input” OR “participant feedback” OR “adolescent feedback” OR “youth feedback” OR “teen* feedback” OR “participant consultation” OR “adolescent consultation” OR “youth consultation” OR “teen* consultation” OR “participant advisory” OR “adolescent advisory” OR “youth advisory” OR “teen* advisory” OR “participatory research”)
Databases searched	Web of Science, Medline, PsychInfo, SociIndex, CINAHL, Africa-wide, Academic Search Complete and PubMed
Limiters	- Published between 1 January 2010 and 30 June 2020 - Peer-reviewed - English language

Authors	Title	Publication year	Country	Setting	Sample size	Sample age range	Sample gender	Number of interventions tested	Type of intervention (category)	Type of intervention (sub-type)	Key objective of intervention	SDGs	Prospective, concurrent or retrospective acceptability	Explicit definition of acceptability	Conceptual framework used for acceptability	Study design	Methods used	Indicators and questions	Overall acceptability high/low	% adolescents that found the intervention acceptable (if	Other stakeholders for whom acceptability
Atujuna et al	Contexts of vulnerability and the acceptal	2018	South Africa	Peri-urban	14	15-17	Female & Male	4	HIV Vaccine, Contraceptives	HIV Vaccine, Vagi	To prevent new H	3	Prospective	NA	NA	Qualitative	IDIs and FGDs	FGDs and IDI interview topic gu	High	NA	Healthcare Workers
Ayissi et al	Awareness, Acceptability and Uptake of H	2012	Cameroon	Not stated	551	14-23	Female	1	HPV Vaccine	HPV Vaccine	To prevent HPV in	3	Prospective	NA	NA	Quantitative	Survey (Questio	Survey included questions on: c	High	76	NA
Banda et al	Acceptability of an economic support cor	2019	Zambia	Rural	16	NA	Female & Male	1	Economic support program	Cash transfers	To increase contra	3, 4 & 5	Concurrent	NA	NA	Qualitative	FGDs and IDIs	Semi structured FGDs and IDIs e	High	NA	Community gate keepers
Barker et al	In-clinic adolescent peer group support fc	2019	Ghana	Not stated	35	12-19	Female & Male	1	Support group	Support group	To increase adhere	3	Concurrent	NA	NA	Qualitative	FGDs	FGD semi structured interview	High	NA	NA
Bull et al	Cyber-Senga: Ugandan youth preferences	2010	Uganda	Urban	15	NA	Female & Male	1	eHealth	Internet-based	To prevent new H	3 & 4	Concurrent	NA	NA	Qualitative	FGDs	FGDs covered: acceptability of	High	NA	NA
Busza et al	Meeting the needs of adolescents living w	2014	Tanzania	Rural & Urba	14	15-19	Female & Male	1	Others	Home based Care	To increase adhere	3	Retrospective	NA	NA	Qualitative	IDIs	Topic guides included: open-en	Low	NA	Primary caregivers and providers
Carney et al	Acceptability and feasibility of a brief subs	2020	South Africa	Not stated	30	13-17	Female & Male	1	Others	Substance use	To reduce the pre	3	Retrospective	NA	NA	Qualitative	IDIs	No questions stated and not ve	High	NA	Caregivers
Cele & Archary	Acceptability of short text messages to su	2019	South Africa	Rural and url	100	12-19	Female & Male	1	eHealth	SMS-based	To increase adhere	3	Prospective	NA	NA	Quantitative	Survey (Questio	Survey probed whether: partici	High	65	NA
Chirwa-Kambole at al	Acceptability of youth clubs focusing on c	2020	Zambia	Rural	68	13-18	Female & Male	1	School based sexual and rep	School based sex	To increase contra	3,4 & 5	Retrospective	NA	NA	Qualitative	FGDs	Semi-structured FGD guide exp	High	NA	Teachers
Cover et al	Acceptability of Contraceptive Self-Injecti	2017	Uganda	Ruran & Urb	46	15-19	Female	1	Contraceptives	Injectable contra	To increase contra	3 & 5	Retrospective	NA	NA	Qualitative	IDIs	IDI semi structured interview gu	High	NA	NA
Dulli, et al	An Online Support Group Intervention for	2018	Nigeria	Not stated	349	15-24	Female & Male	1	Support group	Support group	To increase adhere	3	Concurrent	NA	NA	Qualitative	IDIs through Fac	Semi structured IDI guide explo	High	NA	NA
Exavery et al	Acceptability of condom promotion and c	2012	Tanzania	Rural	1327	10-19	Female & Male	1	Contraceptives	Condoms	To prevent new H	3	Prospective	NA	NA	Quantitative	Survey (Questio	Survey asked whether adolesce	Low	37	NA
Ferrand et al	Perception of Risk of Vertically Acquired H	2011	Zimbabwe	Urban	506	10-18	Female & Male	1	HIV testing	Provider initiated	To increase HIV te	3	Concurrent	NA	NA	Mixed methods	Survey (open-en	Questionnaire assessed: reason	High	99	Family members
Giovenco et al	"The time has arrived": perceptions of be	2018	South Africa	Urban town	57	16-17	Female & Male	1	Other biomedical HIV preve	PrEP	To prevent new H	3	Prospective	NA	NA	Mixed methods	Survey (Questio	Survey questions focused on w	High	84-90	Clinical service providers
Hacking et al	Peer Mentorship via Mobile Phones for N	2019	South Africa	Periurban in	110	12-25	Female & Male	1	eHealth	SMS-based	To increase adhere	3	Retrospective	NA	NA	Qualitative	IDIs	IDIs explored: what participant	High	NA	NA
Hector et al	Acceptability and performance of a direct	2018	Mozambique	Rural	496	16-20	Female & Male	1	HIV testing	Self-testing	To increase HIV te	3	Retrospective	NA	NA	Quantitative	Survey (Questio	Post-test questionnaire capture	High	85	NA
Herman et al	Knowledge, Perceptions and Acceptabilit	2013	Uganda	Urban, peri-	808	12-20	Female & Male	1	School based sexual and rep	School based sex	To increase contra	3,4 & 5	Prospective	NA	NA	Mixed methods	Survey (Questio	Survey assessed: proportion of	High	96	Teachers
Hoque et al	Human Papillomavirus Vaccination Accept	2013	South Africa	Not stated	440	20-21	Female	1	HPV Vaccine	HPV Vaccine	To prevent HPV in	3	Prospective	NA	NA	Quantitative	Survey (Questio	The questionnaire covered: beh	High	77	NA
James et al	Integrated access to care and treatment (	2018	South Africa	Peri-urban	15	15-19	Female & Male	1	Support group	Support group	To increase adhere	3	Concurrent	NA	NA	Qualitative	IDIs	No clear acceptability question	High	NA	Facility Managers and support group facilitators
Jayeoba et al	Acceptability of male circumcision among	2012	Botswana	Not stated	269	13-18	Male	1	Other biomedical HIV preve	VMMC	To prevent new H	3	Prospective & Re	NA	NA	Quantitative	Survey (structur	Structured questionnaires inclu	High	75	Parents/guardians
Kansiime et al	Menstrual health intervention and school	2020	Uganda	Periurban	369	13-21	Female & Male	1	School based sexual and rep	School based sex	Improving menstr	6	Concurrent	NA	NA	Mixed methods	FGDs and IDIs	Specific acceptability questions	High	NA	Teachers and parents
Katahoire et al	Acceptability of HPV vaccine among youn	2013	Uganda	Not stated	422	10-15	Female	1	HPV Vaccine	HPV Vaccine	To prevent HPV in	3	Retrospective	Willingness or re	NA	Qualitative	FGDs	FGDs explored reasons for bein	High	NA	NA
Katz et al	A Qualitative Analysis of Factors Influencir	2013	South Africa	Urban	201	12-19	Female & Male	1	HPV Vaccine	HPV Vaccine	To prevent HPV in	3	Retrospective	NA	NA	Qualitative	IDIs	Interviews covered: contextual	High	NA	Caregivers
Khosa, Zulu and Shung-K	Acceptability and feasibility of a school-ba	2019	South Africa	Rural	18	16-19	Female	1	Contraceptives	School-based con	To increase contra	3 & 5	Prospective	NA	Social ecologica	Qualitative	FGDs	FGD topic guide asked: how par	Low	NA	Parents
Khoza et al	Cash transfer interventions for sexual hea	2018	South Africa	Urban	49	16-18	Female & Male	1	Economic support program	Cash transfers	To prevent new H	3	Concurrent	NA	NA	Qualitative	IDIs	Interviews focused on topics su	High	NA	
Kibel et al	Acceptability of a Pilot Intervention of Vol	2018	Kenya	Not stated	116	12-24	Male	1	Other biomedical HIV preve	VMMC	To prevent new H	3	Retrospective	Perception amo	NA	Mixed methods	FGDs and survey	The questionnaire consisted of	High	81-99	NA
Knopf et al	"This is the medicine:" A Kenyan commur	2014	Kenya	Semirural	13	18-24	Female & Male	1	Support group	Support group	To prevent new H	3	Concurrent	NA	NA	Qualitative	FGDs	FGD questions focused on whe	High	NA	Community leaders
Kuo et al	Acceptability, feasibility, and preliminary e	2020	South Africa	Urban	73	13-15	Female & Male	1	Support group	Support group	To reduce HIV risk	3	Retrospective	NA	NA	Quantitative	Paper satisfactio	Participants ranked interventio	High	100	Parents
Laidlaw et al	Using participatory methods to design an	2017	Malawi	Not stated	54	15-24	Female & Male	1	eHealth	SMS-based	To provide health	3	Prospective	NA	NA	Qualitative	FGDs	FGDs covered: participants opi	High	NA	Adults aged 22-50 years from the same 2 villages
MacCarthy et al	A randomized controlled trial study of the	2020	Uganda	Not stated	147	15-24	Female & Male	1	eHealth	SMS-based	To increase adhere	3	Concurrent	Cognitive and er	Sekhon et al's a	Mixed methods	FGDs and Survey	FGDs covered: whether partici	High	88-97	Providers, counsellors, pharmacist, client rep, and study coordinators
MacPhail et al	Acceptability and feasibility of cash transf	2013	South Africa	Rural	29	14-17	Female	1	Economic support program	Cash transfers	To prevent new H	3	Concurrent	NA	NA	Mixed methods	FGDs and Survey	FGDs covered: whether partici	High	NA	Caregivers
Madiba & Mokgatle	Students want HIV testing in schools" a fo	2015	South Africa	Rural & Urba	2741	14-19	Female & Male	1	HIV testing	School based	To increase HIV te	3	Prospective	NA	NA	Quantitative	Survey (Questio	Questionnaire included 2 main a	High	77	NA
Mavhu et al	Is the PrePex device an alternative for sur	2019	Zimbabwe	Not stated	618	13-17	Male	1	Other biomedical HIV preve	VMMC	To prevent new H	3	Retrospective	NA	NA	Quantitative	Survey (Questio	Questionnaire items included: r	High	95-97	NA
Mburu et al	Knowledge of Cervical Cancer and Accept	2019	Kenya	Not stated	180	12-18	Female	3	HPV Vaccine, Cervical cancer	HPV Vaccine	To prevent HPV in	3	Prospective & Re	NA	NA	Quantitative	Survey (Questio	Through the survey adolescents	High	64	NA
Mitchell et al	Cell phone usage among adolescents in U	2011	Uganda	Urban	1503	12-18	Female & Male	1	eHealth	SMS-based	To prevent new H	3	Prospective	NA	NA	Quantitative	Survey (Questio	The questionnaire covered: 1) a	High	51-61	NA
Niasse et al	Adherence to ready-to-use food and acce	2020	Senegal	Not stated	89	12-18	Female & Male	1	Others	Nutrition/HIV	To reduce malnutr	2&3	Concurrent	NA	NA	Mixed methods	FGDs and survey	The structured questionnaire co	High	79-87	Caregivers
Nuwasiima et al	Acceptability and utilization of family plan	2019	Uganda	Urban slum	142	18-24	Female	1	Economic support program	Non-cash strateg	To increase contra	3, 4 & 5	Concurrent	NA	NA	Quantitative	Survey (Questio	Survey assessed: willingness to	High	93	
Parker et al	Feasibility analysis of an evidence-based p	2013	Democratic R	Not stated	13	15-24	Female & Male	1	Support group	Support group	To provide psycho	3	Concurrent	How the intende	Bowen Feasibilit	Mixed methods	FGDs, activity sh	FGDs covered satisfaction with	High	NA	Facilitators
Peltzer et al	Prevalence and Acceptability of Male Circu	2014	South Africa	Urban & Rur	1489	15-24	Female & Male	1	Other biomedical HIV preve	VMMC	To prevent new H	3	Prospective	NA	NA	Quantitative	Survey (Questio	Men and women were asked ab	High	46-61	NA
Rana et al	Short Message Service (SMS)-Based Inter	2015	Uganda	Urban	39	14-24	Female & Male	1	eHealth	SMS-based	To increase adhere	3	Prospective	NA	NA	Mixed methods	FGDs, structure	FGDs covered: general reaction	High	97	NA
Ritchwood et al	HIV self-testing: South African young adult	2019	South Africa	Rural	95	18-24	Female & Male	1	HIV testing	Self-testing	To increase HIV te	3	Prospective & Re	NA	NA	Mixed methods	FGDs: direct obs	Semi-structured focus group th	High	80-100	NA
Sabben et al	A Smartphone Game to Prevent HIV Amo	2019	Kenya	Not stated	30	11-14	Female & Male	1	eHealth	Game-based	To prevent new H	3	Concurrent	Appeal, relevan	NA	Mixed methods	Survey (Audio C	The survey included questions c	High	67-97	Parents
Sayles et al	Future HIV Vaccine Acceptability Among Y	2010	South Africa	Not stated	42	18-24	Female & Male	1	HIV Vaccine	HIV Vaccine	To prevent new H	3	Prospective	NA	Value-expectanc	Qualitative	FGDs	Semi-structured FGDs covered:	High	NA	NA
Shanaube et al	Community intervention improves knowle	2017	Zambia	Not stated	11175	15-19	Female & Male	1	HIV testing	Home based	To increase HIV te	3	Concurrent	NA	NA	Quantitative	Survey (Househ	The question was a binary ques	High	81	NA
Smith et al	Mobile sexual health services for adolesce	2019	South Africa	Not stated	303	16-24	Female & Male	1	HIV testing	Mobile clinic	To increase HIV te	3	Concurrent	NA	NA	Quantitative	Survey (researc	An 11-item scale, developed fro	High	90	NA
Smith, Wallace & Bekker	Adolescents' experience of a rapid HIV se	2016	South Africa	Not stated	224	16-25	Female & Male	1	HIV testing	Self-testing	To increase HIV te	3	Retrospective	Preference for u	NA	Quantitative	Survey (adminis	3-item acceptability scale asses	High	90-99	NA
Snyder et al	Preliminary results from Hlanganani (Comi	2014	South Africa	Peri-urban	109	16-24	Female & Male	1	Support group	Support group	To increase adhere	3	Prospective & Re	NA	NA	Mixed methods	FGDs, attendanc	Formative phase FGDs explorec	High	85	NA
Tabong et al	Acceptability and stakeholders perspectiv	2018	Ghana	Urban	79	12-17	Female & Male	1	School based sexual and rep	School based sex	To increase contra	3,4 & 5	Prospective	NA	NA	Qualitative	FGDs	FGD topic guides explored: ado	High	NA	Ghana Education Service Program Managers Heads of Basic Educational SchoolsGhana Health Service ASRH Program Managers Population Council Representative Members of Ghana Psychologist Association UNESCO Representative Teachers
Tonen-Wolyec et al	Acceptability, feasibility, and individual pre	2019	Democratic R	Urban	628	15-19	Female & Male	1	HIV testing	Self-testing	To increase HIV te	3	Prospective & Re	Consenting to a	NA	Quantitative	Survey (semi-str	Survey included questions on: r	High	95	Peer educators
Turiho et al	Effect of School-based Human Papillomav	2014	Uganda.	Rural & Urba	827	9-19	Female	1	HPV Vaccine	HPV Vaccine	To prevent HPV in	3	Prospective & Re	NA	NA	Mixed methods	FGDs and survey	FGDs discussed girls' observatic	High	89-93	NA
Turiho, Okello & Muhwe:	Perceptions of human papillomavirus vacc	2017	Uganda	Not stated	43	13-16	Female	1	HPV Vaccine	HPV Vaccine	To prevent HPV in	3	Retrospective	NA	Symbolic intera	Qualitative	FGDs	FGD questions included: unders	High	NA	Health workers, community leaders, teachers and parents
Van der Straten et al	Feasibility and potential acceptability of th	2015	Zimbabwe	Not stated	45	16-21	Female	1	Contraceptives	Cervical barriers	To increase contra	3 & 5	Retrospective	NA	NA	Mixed methods	FGDs and survey	FGDs explored attitudes about	High	71-93	NA
Ybarra et al	Acceptability and feasibility of CyberSeng	2014	Uganda	Urban	366	13-19	Female & Male	1	eHealth	Internet-based	To prevent new H	3	Concurrent	NA	NA	Mixed methods	FGDs, surveys (a	Topic guides for FGDs explored	High	77-94	NA
Ybarra et al	Iterative Development of In This toGether	2020	Uganda	Urban and p	376	18-22	Female & Male	1	eHealth	SMS-based	To prevent new H	3	Prospective & Re	NA	NA	Mixed methods	FGDs via Facebo	FGD topics queried issues relate	High	NA	NA
Zouheir et al	Knowledge of Human Papillomavirus and	2015	Morocco	Urban	688	13-17	Female & Male	1	HPV Vaccine	HPV Vaccine	To prevent HPV in	3	Prospective	NA	NA	Quantitative	Survey (mix of f	Survey included 2 questions to	Low	27	NA

NOTES

* % range included when acceptability was assessed quantitatively through multiple questions

PRISMA 2020 Checklist

Section and Topic	Item #	Checklist item	Location where item is reported
TITLE			
Title	1	Identify the report as a systematic review.	Pg. 1
ABSTRACT			
Abstract	2	See the PRISMA 2020 for Abstracts checklist.	Pg. 2
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of existing knowledge.	Pg. 5
Objectives	4	Provide an explicit statement of the objective(s) or question(s) the review addresses.	Pg. 5
METHODS			
Eligibility criteria	5	Specify the inclusion and exclusion criteria for the review and how studies were grouped for the syntheses.	Pg. 5,6
Information sources	6	Specify all databases, registers, websites, organisations, reference lists and other sources searched or consulted to identify studies. Specify the date when each source was last searched or consulted.	Pg. 6
Search strategy	7	Present the full search strategies for all databases, registers and websites, including any filters and limits used.	Table S1
Selection process	8	Specify the methods used to decide whether a study met the inclusion criteria of the review, including how many reviewers screened each record and each report retrieved, whether they worked independently, and if applicable, details of automation tools used in the process.	Pg. 6
Data collection process	9	Specify the methods used to collect data from reports, including how many reviewers collected data from each report, whether they worked independently, any processes for obtaining or confirming data from study investigators, and if applicable, details of automation tools used in the process.	Pg. 6
Data items	10a	List and define all outcomes for which data were sought. Specify whether all results that were compatible with each outcome domain in each study were sought (e.g. for all measures, time points, analyses), and if not, the methods used to decide which results to collect.	NA
	10b	List and define all other variables for which data were sought (e.g. participant and intervention characteristics, funding sources). Describe any assumptions made about any missing or unclear information.	NA
Study risk of bias assessment	11	Specify the methods used to assess risk of bias in the included studies, including details of the tool(s) used, how many reviewers assessed each study and whether they worked independently, and if applicable, details of automation tools used in the process.	NA
Effect measures	12	Specify for each outcome the effect measure(s) (e.g. risk ratio, mean difference) used in the synthesis or presentation of results.	NA
Synthesis methods	13a	Describe the processes used to decide which studies were eligible for each synthesis (e.g. tabulating the study intervention characteristics and comparing against the planned groups for each synthesis (item #5)).	Pg. 6
	13b	Describe any methods required to prepare the data for presentation or synthesis, such as handling of missing summary statistics, or data conversions.	NA
	13c	Describe any methods used to tabulate or visually display results of individual studies and syntheses.	NA
	13d	Describe any methods used to synthesize results and provide a rationale for the choice(s). If meta-analysis was performed, describe the model(s), method(s) to identify the presence and extent of statistical heterogeneity, and software package(s) used.	NA
	13e	Describe any methods used to explore possible causes of heterogeneity among study results (e.g. subgroup analysis, meta-regression).	NA
	13f	Describe any sensitivity analyses conducted to assess robustness of the synthesized results.	NA
Reporting bias assessment	14	Describe any methods used to assess risk of bias due to missing results in a synthesis (arising from reporting biases).	NA
Certainty	15	Describe any methods used to assess certainty (or confidence) in the body of evidence for an outcome.	NA

PRISMA 2020 Checklist

Section and Topic	Item #	Checklist item	Location where item is reported
assessment			
RESULTS			
Study selection	16a	Describe the results of the search and selection process, from the number of records identified in the search to the number of studies included in the review, ideally using a flow diagram.	Pg. 6
	16b	Cite studies that might appear to meet the inclusion criteria, but which were excluded, and explain why they were excluded.	NA
Study characteristics	17	Cite each included study and present its characteristics.	Pg. 7
Risk of bias in studies	18	Present assessments of risk of bias for each included study.	NA
Results of individual studies	19	For all outcomes, present, for each study: (a) summary statistics for each group (where appropriate) and (b) an effect estimate and its precision (e.g. confidence/credible interval), ideally using structured tables or plots.	NA
Results of syntheses	20a	For each synthesis, briefly summarise the characteristics and risk of bias among contributing studies.	NA
	20b	Present results of all statistical syntheses conducted. If meta-analysis was done, present for each the summary estimate and its precision (e.g. confidence/credible interval) and measures of statistical heterogeneity. If comparing groups, describe the direction of the effect.	NA
	20c	Present results of all investigations of possible causes of heterogeneity among study results.	NA
	20d	Present results of all sensitivity analyses conducted to assess the robustness of the synthesized results.	NA
Reporting biases	21	Present assessments of risk of bias due to missing results (arising from reporting biases) for each synthesis assessed.	NA
Certainty of evidence	22	Present assessments of certainty (or confidence) in the body of evidence for each outcome assessed.	NA
DISCUSSION			
Discussion	23a	Provide a general interpretation of the results in the context of other evidence.	Pg. 11
	23b	Discuss any limitations of the evidence included in the review.	Pg. 13
	23c	Discuss any limitations of the review processes used.	Pg. 13
	23d	Discuss implications of the results for practice, policy, and future research.	Pg. 13-14
OTHER INFORMATION			
Support	25	Describe sources of financial or non-financial support for the review, and the role of the funders or sponsors in the review.	Pg. 15
Competing interests	26	Declare any competing interests of review authors.	Pg. 15
Availability of data, code and other materials	27	Report which of the following are publicly available and where they can be found: template data collection forms; data extracted from included studies; data used for all analyses; analytic code; any other materials used in the review.	NA

BMJ Open

A decade of research into the acceptability of interventions aimed at improving adolescent and youth health and social outcomes in Africa: a systematic review and evidence map

Journal:	*BMJ Open*
Manuscript ID	bmjopen-2021-055160.R1
Article Type:	Original research
Date Submitted by the Author:	16-Oct-2021
Complete List of Authors:	Somefun, Oluwaseyi; University of the Western Cape, School of Public Health Casale, Marisa; University of the Western Cape, School of Public Health Hauptronnie, Genevieve; University of Cape Town Desmond, Chris; University of KwaZulu-Natal Cluver, Lucie; University of Oxford, Department of Social Policy and Social Work Sherr, Lorraine; University College London., Clinical and Health Psychology
Primary Subject Heading:	Health policy
Secondary Subject Heading:	Evidence based practice, Global health, Health policy, Public health
Keywords:	PUBLIC HEALTH, Demography < TROPICAL MEDICINE, Infectious disease/HIV < NEUROLOGY

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A decade of research into the acceptability of interventions aimed at improving adolescent and youth health and social outcomes in Africa: a systematic review and evidence map

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Abstract

Objective

Interventions aimed at improving adolescent health and social outcomes are more likely to be successful if the young people they target find them acceptable. However, no standard definitions or indicators exist to assess acceptability, acceptability research with adolescents in LMICs is still limited, and no known reviews synthesise the evidence from Africa. This paper maps and qualitatively synthesizes the scope, characteristics, and findings of these studies, including definitions of acceptability, methods used, the type and objectives of interventions assessed, and overall findings on adolescent acceptability.

Design

We conducted a systematic review of peer-reviewed studies assessing intervention acceptability with young adults (aged 10-24) in Africa, published between January 2010 and June 2020.

Data sources

Web of Science, Medline, PsychInfo, SociIndex, CINAHL, Africa-wide, Academic Search Complete and PubMed were searched through July 2020

Eligibility criteria for selecting studies

Papers were selected based on the following inclusion criteria: if they (i) reported primary research assessing acceptability (based on the authors' definition of the study or findings) of one or more intervention(s) with adolescents and young adults 10-24; (ii) assessed acceptability of intervention(s) aimed at positively influencing one or more development outcome(s), as defined by SDG indicators; (iii) reported on research conducted in Africa; (iv) were in the English Language; (v) were peer-reviewed and; (vi) were published between 1st January 2010 and 30th June 2020.

Data extraction and synthesis

Abstracts were reviewed independently by the two first authors to determine relevance. Full text of potentially eligible studies were retrieved and independently examined by the same two authors; areas of disagreement or lack of clarity were resolved through discussion by the two authors and – where necessary – the assessment of a third author.

Results

55 studies were considered eligible for inclusion in the review. Most studies were conducted in Southern Africa, of which 32 jointly in South Africa and Uganda. The majority of interventions assessed for acceptability could be classified as HIV or HPV vaccine interventions (10), E-health (10), HIV testing interventions (8), support group interventions (7) and contraceptive interventions (6). The objectives of most interventions were linked to SDG3, specifically to HIV and sexual and reproductive health. Acceptability was overall high among these published studies. 22 studies provided reasons for acceptability or lack

thereof, some specific to particular types of interventions and others common across intervention types.

Conclusions

Our review exposes considerable scope for future acceptability research and review work. This should include extending acceptability research beyond the health (and particularly HIV) sector and to regions in Africa where this type of research is still scarce; including adolescents earlier, and potentially throughout the intervention process; further conceptualising the construct of acceptability among adolescents and beyond; and examining the relationship between acceptability and uptake.

Key words: acceptability; adolescents; youth; interventions; Africa

Strengths and limitations of this study

- This systematic review was carried out in line with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA)
- Our search strategy and composite search strings were sufficiently broad in scope to include studies assessing all types of interventions aimed at improving health and other social outcomes among adolescents and youth in Africa
- Screening of study abstracts and full text, as well as data extraction, were conducted independently by at least 2 authors
- Our review did not include studies conducted before 2010.
- The review did not include a quality assessment given the diversity of study designs, though we note this is not a prerequisite for a mapping review

Introduction

Addressing the developmental needs of adolescents and youth in African countries is critical if the continent is to achieve its sustainable development goals (SDGs), and envisaged transformation articulated in the African Union's overarching Agenda 2063 (1, 2). Adolescents make up the largest generation of their age group in history (3),and Sub-Saharan Africa (SSA) accounts for over 20% of the estimated 1.8 billion adolescents and young adults globally (4). Investing in adolescent wellbeing can have positive effects for individuals during adolescence and beyond, as well as potential positive societal effects. Interventions that reduce the consequences of poverty among adolescents, or lead to more positive behaviours, can influence development and wellbeing during adolescence and throughout the life course (5-7). Investment during adolescence can strengthen early childhood investments and reduce the burden of morbidity and mortality in adulthood (8). Moreover, it has been argued that investment in adolescents can help realize the 'demographic dividend' (9, 10), and reduce generational inequalities (11).

Substantial investment has been made globally in adolescent interventions. These have focused on areas such as sexual and reproductive health, nutrition, uptake of vaccines and prevention of substance abuse (12). Unfortunately these interventions have not always recorded impressive impact (13). Data from both high-income countries (HICs) and low- and middle-income countries (LMICs) reveal that many interventions focusing on adolescents are fragmented, poorly designed, and unequal in quality (14). One reason for this may be an insufficient understanding of the particular nature of adolescence (15).

Adolescence is a critical period characterised by rapid development of the physical, cognitive, social, and emotional capabilities that are instrumental across their life-course (3). Adolescence is also a time of gathering independence. Pathways to learning and experiencing such independence are varied, with experiential learning playing a key role. The rapid growth associated with this phase and its influences on behaviour need to be well understood in order to design timely and effective interventions (16).

Interventions may also fail to sufficiently consider the diverse environments in which adolescents live, that may shape their decisions and behaviour (17). This could lead to interveners missing important factors that, if unaddressed, will prevent the intervention from having the desired impact. Additionally, program implementers may lack the specialized skills necessary for delivering and sustaining these interventions (12). Adult interventions may not translate directly for adolescent audiences and programme adjustments may be inadequate.

Since most interventions seek to effect adolescent behavioural change, many of the obstacles to uptake and effectiveness could be addressed by affording sufficient importance to the perspectives and participation of adolescents themselves. When adolescents feel coerced to engage in a particular behaviour or accept interventions that they don't identify with, they are more likely to resist the message of the proposed intervention, or to stop participating altogether (18). Instead, interventions that are

acceptable to adolescent end-users are likely to have higher social validity (19), uptake and effectiveness (20, 21).

However, adolescent involvement and input in intervention design has been varied, and models of adolescent inclusion have been poorly envisaged and implemented. There is still a relatively low number of acceptability studies among adolescents in LMICs and specifically in Africa, particularly beyond the health sector (19, 20). To our knowledge no existing reviews comprehensively map the extant body of acceptability research in Africa and aggregate the evidence emerging from these studies. Furthermore, there is no clear and standard definition of acceptability (20) in Africa and beyond. This in turn raises several methodological challenges when setting out to assess acceptability, including the choice of measurement frameworks and tools (20). It also highlights the scope for further conceptualisation of this construct, particularly in specific populations and geographical regions.

We conducted a systematic review to identify studies that conducted primary research with adolescents and young adults (10-24) in Africa over the past decade (January 2010-June 2020), to assess the acceptability of interventions aimed at positively influencing their developmental outcomes. This paper maps and qualitatively synthesizes the scope, characteristics, and overall findings of studies identified. This includes evidence addressing the questions of whether and how the construct of acceptability is conceptualised and defined within these studies, the methods and indicators used, the type and key objectives of interventions assessed, as well as evidence on what adolescents find acceptable and why. Based on these findings, we aim to discuss implications for future adolescent-focused interventions in Africa and identify gaps for future acceptability research with this population.

Methods

Search strategy

The systematic review was carried out in line with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA). We used the PICO (Population, Intervention, Comparison, Outcome) criteria (22) to help determine eligibility criteria for inclusion develop the search strategy and composite search terms developed (see Table S1). We searched 8 online databases (listed in Table S1), covering a wide range of behavioural science research, and searched the reference lists of eligible papers.

Study selection and data extraction

Papers were selected based on the following inclusion criteria: if they (i) reported primary research assessing acceptability (based on the authors' definition of the study or findings) of one or more intervention(s) with adolescents and young adults 10-24; (ii) assessed acceptability of intervention(s) aimed at positively influencing one or more

development outcome(s), as defined by SDG indicators; (iii) reported on research conducted in Africa; (iv) were in the English Language; (v) were peer-reviewed and; (vi) were published between 1st January 2010 and 30th June 2020. We restricted our review to a 10-year period, taking into account the available researcher time and other available resources to conduct this review, and its relatively broad scope in terms of types of interventions and developmental outcomes included. We did not include limiters for study design or methodological tools, type of intervention or sector, or type of developmental outcome the intervention intended to influence. To be as inclusive as possible, we included studies that worked with broader samples (e.g., youth and adults) but disaggregated the results and reported findings specifically for the age group of interest (10-24). We imported all references from the online databases into Endnote, where duplicates were identified and removed. Abstracts were reviewed independently by the two first authors (ODS and MC) to determine relevance. Full text of potentially eligible studies were retrieved and independently examined by the same two authors; areas of disagreement or lack of clarity were resolved through discussion by the two authors and – where necessary – the assessment of a third author (GH). Reasons for exclusion of each paper not deemed eligible were recorded in an excel spread sheet. We developed a detailed extraction sheet, using Excel software, to extract key characteristics and findings of eligible papers. For reliability, the information for each paper was extracted separately by at least two of the first three authors and differences were resolved through discussion among the authors.

Patient and public involvement

Patients and the public were not involved in the preparation of this study.

Results

Eligible studies included in the review

Figure 1 presents the PRISMA flow diagram describing the process of study selection and reasons for study exclusion. A total of 4692 titles and abstracts were screened after removing duplicates, 278 articles were subjected to a full-text review, and a final 55 studies were considered eligible for inclusion in the review.

Figure 1 here:

Study characteristics: publication year, location and sample

Below we present a summary of key characteristics of the 55 eligible studies included in our review. More than half of the papers were published between 2018-2020 with 22% of the papers published in 2019, as shown in the supplementary figure S1.

Fig.2 below provides a visual representation of the location of studies on the continent. There is a clear concentration of acceptability studies in South and East Africa, with approximately half of identified studies conducted in South Africa (19) and Uganda (13). Only seven studies were from West and Central Africa and only one from North Africa.

Figure 2 here:

The supplementary table S2 provides information on study characteristics and overall findings for the entire list of eligible studies, and by each type of intervention category (as indicated below) in separate sheets. Most study samples included male and female participants, while 11 studies worked only with females and three with males only. 44 studies worked with samples that fell entirely within the specified age range (10-24), while 11 included studies worked with broader samples (e.g., youth and adults) but disaggregated the results and reported findings specifically for the age group of interest. To be as inclusive as possible, we included 10 studies that did not clearly specify the exact age range of participants, but for which available information indicated that the sample would have been entirely or almost entirely within this range (e.g. secondary school and university students (23-28) or where sample descriptive data indicated a sample consisting almost entirely of participants 24 or younger (29-31).

While our inclusion criteria focused on primary acceptability research with adolescents and young adults, it should be noted that 25 studies also collected acceptability data from other stakeholders. These include caregivers or other family members (32-40), teachers, facilitators (26, 41, 42) , community leaders or gate keepers, (28, 43), peer mentors, service providers and healthcare workers (44-51) . Since the focus of this mapping review is the acceptability of young adults specifically, we do not synthesise or report on perspectives of other stakeholders.

Types and objectives of interventions assessed for acceptability.

We categorised interventions assessed for acceptability both by type of intervention, based on their key components (see Figure 3), and stated objectives of the interventions (see Figure 4). In terms of type of intervention, interventions were classified as HIV or HPV vaccine interventions (10), E-health (10), HIV testing interventions (8), support group interventions (7), contraceptive interventions (6), voluntary medical male circumcision programs (VMMC) (4), school-based sexual and reproductive health education (4), economic support programs (4) and pre-exposure prophylaxis (PrEP) (2). Five studies did not fit into the above intervention categories and were grouped as 'other'; they consisted respectively of nutritional therapy, a psychosocial - home based care intervention, a counselling support intervention to address substance abuse, cervical cancer screening and a rectal microbicide intervention for HIV prevention. It should be noted that two of the studies reviewed assessed more than one intervention (45, 52) (3 and 4 respectively). The total number of interventions assessed for acceptability was therefore 60.

Figure 3 here:

More detail on intervention sub-types is included in Table S2. For example, E-health interventions included game based (1), SMS based (7) and internet-based (2) programs. All 7 support group interventions provided psychosocial or educational support related to HIV, and 5 worked only with young adults living with HIV. One group intervention was delivered through both a social media platform and in-person meetings (53), one was a

family based support intervention with adolescent-parent dyads (33), four were linked to public healthcare facilities (42, 47, 54, 55) and one was a community intervention (43).

The primary objectives of most interventions were focused on HIV- or sexual and reproductive health-related outcomes (see Figure 4): 19 primarily aimed to prevent new HIV infections, ten to prevent HPV infection, nine to increase HIV treatment adherence and retention in care, eight to increase the uptake of HIV testing, eight aimed at increasing contraceptive uptake and reducing early childbearing and six provided psychosocial support for adolescents living with HIV.

The objectives of almost all interventions were therefore linked to indicators within SDG3 (ensuring healthy lives and promoting well-being). However, one study could also be linked to SDG2 (food security and improved nutrition), 6 to SDG4 (inclusive and equitable quality education), 8 to SDG5 (gender equality) and 1 to SDG6 (access to water and sanitation).

Figure 4 here:

Definitions and conceptual frameworks for acceptability

Only seven of the 55 reviewed studies provided an explicit definition of acceptability and only six used a conceptual framework (as indicated in Table S2). Three definitions focused on the preference for or willingness to use the intervention: Tonen-Wolyec et al (2019) defined acceptability as consenting to and using the (HIV self-testing) intervention; Smith, Wallace (30) defined it as the preference for using the (HIV self-testing) device; and Katahoire et al (2013) defined acceptability as the willingness or reluctance to use and complete the intervention (in this case the 3 doses of HPV vaccine) (56).

Two definitions focused mainly on responses to the intervention. MacCarthy et al (2020) (48) referred to a definition and framework developed by Sekhon et al (2017)(20) and defined acceptability as the cognitive and emotional responses to an intervention (20, 48). Parker et al (2013) (42) defined acceptability as how the intended individual recipients react to a program, guided by the Bowen feasibility framework (57). A further two studies conceptualized acceptability as an implementation outcome and focused on value, appeal and likeability: Kibel et al (2019)(58) referred to the perception among stakeholders that a certain element of the program was valued, agreeable, or satisfactory, while Sabben et al (2019)(34) defined acceptability as appeal, relevance, value, usability, and understandability, based on the Technology Acceptance Model's (TAM) framework (59).

Three studies referred to a conceptual framework but did not provide an explicit definition of acceptability. In their assessment of individual and environmental barriers and facilitators related to use of a school-based contraception clinic, Khoza et al (2019) referred to the social ecological framework (60). Sayles et al's (2010) study was guided by value-expectancy and social marketing theories (61); the authors investigated vaccine attitudes, normative vaccine beliefs, and perceived risk and severity of HIV as

determinants of HIV vaccine uptake. Turiho et al's (2017) study used the symbolic interactionism theory (62) and some aspects of the Health Beliefs Model (HBM) to explain how community members' perceptions and their interaction shape vaccine acceptability.

Study design, methods and indicators

Sixteen studies included in this review (29%) assessed 'anticipated' or prospective acceptability among adolescents who had not (yet) received the intervention (20). 18 studies (33%) assessed acceptability concurrently, during the delivery of the intervention, while 14 (25%) assessed acceptability post-intervention, retrospectively. The remaining seven (13%) of the studies assessed interventions prospectively and retrospectively; among these, two studies worked with separate groups of adolescents who had received and not yet received the intervention (52, 63), while the remaining 5 interviewed adolescents at two different stages of the intervention (40, 44, 55, 64, 65). Five studies involved adolescents in the study design (43, 50, 53, 55, 65).

20 studies described their methodology as solely qualitative, 18 as quantitative and 17 as mixed methods. 11 of the qualitative studies used only focus group discussions (FGDS), 7 used only in-depth interviews (IDIs) and 2 used both methods. Most of the quantitative studies (15) employed structured survey questionnaires. The mixed methods studies combined FGDs or IDIs with survey questionnaires, online surveys and evaluation reports.

As detailed in the supplementary table S2, a wide range of questions and indicators were used to measure acceptability. None of the studies used a standardized previously validated instrument, although two papers drew from existing instruments (66, 67). The majority of questions asked across studies covered participants' overall perceptions and experience of the intervention, willingness to use the intervention, understanding of the intervention, barriers and facilitators of access and use, the perceived effectiveness of the intervention and willingness to recommend or distribute it to others.

Acceptability findings

Overall, acceptability of interventions assessed was high. Of the 55 studies, 30 assessed acceptability quantitatively and reported on the proportion of young adults in the sample that found the intervention acceptable. While some studies quantified acceptability through a single percentage, based on one question or indicator, a number of studies reported a range, based on multiple questions or indicators. One of the reviewed studies reported 100% acceptability (33), while acceptability ranged from 64% - 100% in 25 studies and 46% - 61% in 2 studies (27, 52, 68, 69). Only two studies clearly reported acceptability below 50%: at 37% for a contraceptive intervention in Tanzania (70) and 27% for an HPV vaccine study in Morocco (71). Reasons given for low acceptability of the contraceptive intervention were that adolescents and their peers were too young to be sensitized about condoms, that condoms would not be used properly and that using contraception was a sin (70). Reasons were not provided by adolescents for the Moroccan study;

however, in quantitative analysis, older age, female gender, studying at a public (versus private) school and lower educational attainment were associated with lower odds of acceptability for the HPV vaccine (71).

The remaining 25 studies did not quantify acceptability. However, the authors of two of these studies reported that adolescents found the interventions to be unacceptable, based on their overall findings. One study in South Africa assessed contraceptive interventions (32); a key reason for low acceptability was the belief that a school-based contraceptive clinic (SBCC) could promote promiscuity by sending a message that 'teenage sex was acceptable' and making contraceptives easily accessible (32). The second study assessed a psychosocial home based care intervention in Tanzania (72), which adolescent participants felt did not align well with their expectations. They believed the intervention to be more relevant to their caregivers and were disappointed in the lack of financial support in a context of widespread poverty (72).

Findings of the remaining 51 studies overall indicated high levels of acceptability. Some of these studies also provided various reasons as to why adolescents found the interventions acceptable (n=22) or (for a minority of adolescents) not acceptable (n=20). These are presented in Table 1, by type of intervention, for studies with both low and high overall acceptability. The main reasons e-Health interventions were acceptable to adolescents were: knowledge gained from the intervention regarding their sexual health (34, 65), the privacy these interventions provided (23, 48) and knowing how to make use of the intervention (25, 34). Adolescents who instead did not find these interventions acceptable felt that the content was not culturally appropriate (23, 25, 65), highlighted technological glitches (48, 65) or were concerned with inclusiveness where, for example, not all the young adults had access to a necessary device or risked unintended disclosure of private information when sharing devices (65, 73).

Confidentiality, appropriateness, privacy, and decision-making autonomy were among the reasons adolescents found HIV testing interventions (including self-testing and testing in schools) acceptable (44, 64, 74). Fear of the procedure, concerns with the cost and validity of the test, and inadequate emotional support were reasons given for lack of acceptability (64, 75, 76). Support group interventions were considered acceptable because of the emotional support provided and because young adults found the groups to be empowering and were able to discuss HIV-related issues in a stigma-free environment (42, 47, 53, 55).

Knowledge was a key reason for high vaccine acceptability for both HPV and HIV vaccine interventions. For example, adolescents' understanding that HPV vaccines could prevent cervical cancer and HIV made them more likely to accept the interventions (63). Conversely, lack of knowledge or understanding of the intervention was linked to low acceptability (36, 52, 56). Other reasons given for acceptability were greater female autonomy and agency to protect themselves, in the event of sexual violence or transactional sex, and encouragement of peers (36, 63). On the other hand, perceived cost, myths and distrust of vaccine providers, and fear of side effects, were themes raised to explain low acceptability (61, 77).

Reasons for acceptability of economic support interventions included financial autonomy (78) and the freedom to decide how to use cash transfers (28). However, concerns around the process of selecting which individuals or households were to receive transfers, as well as inclusion, sustainability and effects on social relations and social equity within the community (38, 78), were factors that threatened acceptability.

Table 1: Reasons provided by adolescents for acceptability and unacceptability of interventions, by type of intervention.

Type of intervention	Reasons given for acceptability	Reasons given for unacceptability
eHealth	Knowledge provided on sexual health and HIV (25, 34) Privacy (23, 48) Increased self-efficacy to manage risky situations(34) Ease of use (34) Supportive mentors (29) Freedom to talk openly to mentors about HIV status and disclosure (29)	Visual content considered not culturally appropriate (23) Conservative views about certain topics discussed (e.g., oral sex) (25, 65) Concerns around access and inclusiveness, as not all youth owned devices (65, 73) Fear of accidental disclosure of confidential information through device-sharing (73) Technical glitches with devices (48, 65)
Vaccines	Protection from HPV in the case of sexual abuse or transactional sex (36) Protection from HIV infection when the transmission risk is out of an individual's control (45, 61) Desire to have unprotected sex for child-bearing (women on HIV-vaccine) (61) Being able to have unprotected sex and multiple sexual partners (male adolescents on HIV vaccine)(61) Protection in serodiscordant relationships while avoiding the HIV stigma and costs related to buying condoms (male adolescents on HIV vaccine) (45)	Distrust of government and scientists (61) Association of vaccine uptake with promiscuity (61) Fear of HIV testing and HIV stigma (61) Cost of vaccine (61) Fear of vaccine side effects (51, 61, 63, 77) Fear of injection (77) Lack of knowledge about vaccine and cervical cancer (36, 52, 56)
HIV testing	Confidentiality of HIV self-testing at schools (44, 76) (74) Ease of use of HIV self-test (44, 76) Fast results of self-test(44) Ability to test independently with self-test (64) Opportunity to know HIV status, for peace of mind and to plan for the future (provider-initiated testing) (39) Lower waiting time, less distance to facility, and friendlier staff at mobile (versus 'conventional') clinic(67)	Concern with validity of HIVST self-test kit results (64, 76) Costs of HIV test kit (64) Lack of emotional support with self-test(64, 76) Fear of the procedure (finger prick) (30, 75) Belief that school is not the right place for HIV testing (74) Lack of privacy and risk of stigma through school testing (74)
Support group	Emotional and social support provided (42, 47, 53, 55) Knowledge and skills provided (42, 55) Enjoyed participating (53)	

	Stigma free environment (54) Confidential space to openly discuss sexual health and behavior (42, 53) Greater decision-making autonomy to negotiate safer sexual relationships (42)	
SRH education	Increased knowledge on sexual and reproductive health (24, 41) Supportive teachers at youth clubs (41) Girls more comfortable attending school during menstruation (24)	Conservative views about certain topics discussed (linked to sexual intercourse) (41)
VMMC	Material support provided during the intervention (e.g. food, shelter and security) (58) Knowledge gained through participation (58)	Penile swelling after removal and transient discoloration of inner foreskin (79)
Economic support	Increased school retention (28, 38, 78) Financial autonomy (28, 78) Easy access to cash transfer (28)	Concerns with sustainability and impact of transfer termination (78) Exclusion of certain households or individuals in the community from receiving transfers (28, 38) Perception that selection process was unfair (38) Lack of interest in family planning services accessible through (conditional) benefit cards (80)
Contraception	Ease of use of self-injectable and female contraceptives (66, 81) Privacy and convenience of self-injectable contraceptives (81) Female autonomy to control female contraceptive use(45, 66) Condom fatigue and HIV fear (45)	Conservative views on condom use and messaging (e.g. using condoms is a sin, condoms may encourage early sexual debut) (32, 70) Belief that adolescents are too young for condom promotion and sexual activity [3] Fear of needles and self-injection for injectable contraceptives (81) Concerns with not being able to use condoms properly (70) Belief that condoms cause AIDS and other diseases (70) Concerns about the effect of cervical contraceptive being in the body for a long time (66) Concern with stigma(45) Waiting times at health facilities (45)
PrEP	Prevents transmission in serodiscordant couples(45) Easy to use (45)	Conflict with traditional methods and beliefs(45) Fear of side effects (45)
Psychosocial home-based care		Program more relevant to caregiver versus adolescent needs (72) Lack of financial support in a context of widespread poverty (72)

Discussion

Findings of this review indicate two positive trends. The first is an increase, over the past decade, in the number of acceptability studies with adolescents and youth on the continent. Though numbers are overall low, this could signal increasing recognition of the value of engaging young people when designing and implementing interventions intended for them. The second is that acceptability of interventions assessed was generally high. This suggests an overall good alignment of interventions with adolescent needs and preferences. While studies focusing on acceptability among general adolescent populations are scarce even in high income countries, our findings of overall high acceptability were in line with a review on the acceptability of e-mental health

services for children, adolescents, and young adults conducted in Canada (82). However, we should also be aware of the possibility of publication bias (83, 84), as research showing less favourable acceptability results may be less likely to be written up and published.

A key limitation of this review is that we did not include grey literature, given available resources, the review's already broad scope, and to ensure a minimum quality of studies included. We also did not include studies published before 2010 and after June 2020, or studies that weren't published in English, so the review may have excluded relevant studies outside of this time period or carried out in African countries where English is not the (only) official language. We also did not conduct a quality assessment, given the heterogeneity of interventions assessed and study designs; however, we note that this is not a requirement of a mapping review, which aims to summarise available evidence in an area versus focus on a particular research question (85-87).

Acceptability findings

Despite the diversity of intervention settings, types of interventions and modes of delivery across studies, several common themes emerged from reasons given by adolescents to explain why specific interventions were acceptable to them. These included the product or intervention being easy to use, knowledge of the intervention or knowledge provided by the intervention, the intervention allowing for (greater) autonomy, adolescents feeling supported while participating in the intervention and feeling assured that their privacy and confidential information would be protected. Ease of use (88, 89) and support received (90) from the intervention were reasons for acceptability in high income countries. Although reasons for 'unacceptability' were more diverse, overarching themes could also be identified among these, for example: conservative views about the intervention or its content; concerns around intervention costs, access and inclusiveness; fear of pain and side effects (for biomedical interventions); stigma, myths or distrust; and lack of knowledge or support. The cost (91) of interventions, pain (92) and conservative views about the intervention (93) have also been outlined as reasons for unacceptability among adolescents and youth in low middle income and high income countries. While certain drivers of unacceptability mirrored those of acceptability (e.g. knowledge and support), these drivers mostly differed, suggesting that acceptability and unacceptability are not necessarily represented by one continuum.

These findings suggest that intervention developers and implementers across the continent should pay attention to key aspects of interventions and their delivery that adolescents clearly care about and seek to address these from the intervention development phase. They should ensure that adolescents are provided with adequate

knowledge, training, and resources to properly understand the intervention and feel confident in their ability to use it and that they have access to sufficient logistical and emotional support while participating. They should also ensure that these young people's confidential information is protected, so that they are in turn protected from much-feared stigma and other potential negative social consequences. Moreover, they should bear in mind that adolescents value autonomy and that this has a gender dimension. Autonomy relates not only to being able to choose to participate in and use an intervention, but also being empowered by the knowledge it may provide and the greater control it may afford young people (particularly young women) in managing high risk situations and unequal relationships.

It may also be worth paying particular attention to acceptability findings for specific types of interventions, given current African and global public health challenges. For example, the role of digital technology in achieving many of the SDGs is well documented (94) and merits particular attention in the context of the Covid-19 pandemic (95, 96). While young people remain the most connected population group to digital platforms(97), there is a clear digital divide, as more than 60% of young adults in Africa do not have access to internet (98, 99). Findings of this review show overall high acceptability of e-Health interventions (34, 50), as adolescents highlighted opportunities presented by digital technology, for example by reducing the cost of in-person interaction (53). Yet concerns raised around connectivity issues, lack of access to devices and unintended disclosure of confidential information (53, 73) represent challenges for the acceptability, equitable access, and effectiveness of e-Health programs. It is therefore important for intervention providers to assess these challenges early on, and to explore ways of potentially increasing access to devices or technologies within the intervention itself or by supporting concurrent initiatives (65).

Low acceptability of several interventions aimed at increasing contraceptive use and HIV testing also merits particular attention. HIV transmission and relatively low rates of HIV testing and linkage to antiretroviral therapy (ART) remain a concern among young adults (100, 101). Several studies included in this review highlighted, for example, adolescents' fear of stigma and lack of privacy regarding HIV testing interventions in schools (74), concerns about not being able to properly perform oral HIV testing on their own (76) and conservative views of contraceptive promotion and use (32, 70). These perspectives are likely shaped by inadequate understanding of interventions, but also by social norms surrounding sexuality and contraception within adolescents' homes, schools, and communities (102, 103). Also, fear of vaccines and their side effects (104, 105) are important to note and address, in relation not only to HPV prevention, but also to the current Covid-19 vaccine rollout.

All of the above examples highlight the importance of strengthening adolescents' knowledge of interventions and how to interact with them, but also of understanding

and engaging with the broader context within which adolescent acceptability is shaped (102). One way to achieve this is to involve adolescents (preferably potential end-users) early in the design and planning phase of the intervention and – if possible - at various stages of the intervention life cycle. Yet, as indicated above, less than half of the studies in this review (42%) assessed prospective acceptability and very few studies involved adolescents in the study design and/or at multiple phases of the intervention. There is clearly potential to allow for more meaningful and consistent adolescent engagement, if young people are to have a stronger role in shaping the development, adaptation and scale up of interventions (20).

A second key approach would be to engage early on and assess acceptability with other stakeholders who are central to an intervention being well-targeted, well-implemented and accepted by adolescents and the broader community. These may include intervention implementers and facilitators, but also caregivers, partners and peers, teachers and community leaders. As noted above, 25 studies in this review also assessed acceptability of other types of stakeholders. Future review analyses and acceptability studies could further focus on acceptability among these groups of individuals, and its implications for adolescent acceptability and intervention success.

Gaps and key areas for future research

Our review highlights several key gaps and related areas for future intervention acceptability research. First, there appears to be a gap in geographical coverage, particularly in West, Central and North Africa. However, as noted above, confining our search to English language publications may have excluded some studies from African countries where French is the first language. Given that adolescent needs and preferences are likely to differ across areas with very different social and cultural norms and faith contexts (106), we cannot simply extrapolate acceptability findings to other countries or communities across the continent.

Second, there is clearly scope for more acceptability research in important areas for adolescent development beyond (physical) health and, within the health sector, beyond HIV. As important as reducing HIV transmission and increasing testing and treatment adherence may be in this population (100, 101), they are clearly not the only dimensions of adolescent health and broader wellbeing that merit attention and investment. There is a glaring lack of acceptability studies in areas of adolescent development beyond SDG 3. These include education access and outcomes, employment opportunities, access to water and other services, gender equality and protection from violence, social protection and mental health (107).

The focus on specific types of interventions likely reflects, to a large extent, global health funding and research priorities over the past decades. There has been a considerable amount of international aid dedicated to addressing HIV (108, 109) and particular concern around the acceptability of HIV interventions. Moreover, the concentration of acceptability research in specific countries in Africa is likely in part a reflection of

disparities in independent research infrastructure and capacity across the continent (110, 111). It would also seem that 'acceptability' is a concept and term that has gained traction primarily within the health sector (20). The extension of acceptability research to geographical and developmental areas where it is currently scarce therefore cannot be addressed solely by decisions of individual research teams. It will to some extent require a change in global health and funding priorities, and the 'adoption' of acceptability research by other sectors.

A third gap highlighted by this review is the considerable scope to further conceptualise the construct of acceptability, by more clearly defining it and identifying its key components. Our review reinforced the absence of a clear or standard definition of acceptability, or common tools and indicators. In fact, the large majority of papers included in this review (48) referred to the concept of acceptability without defining it at all, requiring the reader to review the questions and indicators used to gain some understanding of how the construct of acceptability was conceptualised and operationalized. As highlighted by other authors, this lack of common definitions and frameworks makes the selection of measurement indicators for empirical enquiry in this area more difficult and the comparability of acceptability results challenging (112, 113). There have been recent efforts to address these gaps; in particular, Sekhon and colleagues' theoretical framework for acceptability (TFA), published in 2017 (20), has made a valuable contribution to the scarce conceptual literature in the field. However, there is still much work to be done to apply and test the framework in specific populations. For example, its relevance and completeness in investigating acceptability among adolescents, in less-resourced settings and beyond the (biomedical) health sector is still unclear. Also unclear is the important link between intervention acceptability and uptake, considering that willingness to use the intervention is often included among questions used to assess acceptability (see table S2). Lastly, it is encouraging to note that a relatively large number of studies in our review used mixed methods approaches to assess acceptability; however, there is clearly still scope to employ and combine more innovative methodologies (55, 65).

Conclusion

As the first systematic review to aggregate and synthesise a decade of acceptability studies with adolescents and youth in Africa, we believe this study makes a valuable contribution to the African and global literature on acceptability. It highlights the overall high level of acceptability of the interventions assessed, and some of the reasons why adolescents and young adults may or may not find interventions acceptable– both specific to particular types of interventions and common across intervention types.

However, it also exposes considerable scope for future acceptability research and review work, to extend and strengthen the existing body of evidence. This should include extending acceptability research beyond the health (and particularly HIV) sector and to countries in Africa where this type of research is still scarce; including adolescents and

other potential key stakeholders earlier, and potentially throughout, the intervention process; further conceptualising the construct of acceptability; and investigating the relationship between acceptability and intervention uptake and success.

Data availability statement

No additional data are available.

Patient consent for publication

Not required.

Acknowledgements: ODS, MC, GH, CD, LC and LS receive funding from the UKRI GCRF Accelerating Achievement for Africa's Adolescents (Accelerate) Hub (Grant Ref: ES/S008101/1) and the Oak Foundation: (Grant Number R46194/AA001)

Contributors: ODS and MC were involved in the conceptualisation of the paper, the data extraction and analysis, and the manuscript writing; GHR was part of the data extraction and analysis, and reviewed and revised the manuscript; CD reviewed and revised the manuscript; LC reviewed and revised the manuscript; and LS reviewed and revised the manuscript. All authors read, reviewed and approved the final manuscript.

Funding Statement: Funding received from the South African Research Chair in Health Systems, Complexity and Social Change supported by the South African Research Chair's Initiative of the Department of Science and Technology and National Research Foundation of South Africa (Grant No 82769). Any opinion, finding and conclusion or recommendation expressed in this material is that of the author and the NRF does not accept any liability in this regard.

Ethics approval statement: Not applicable

Competing interests: None declared.

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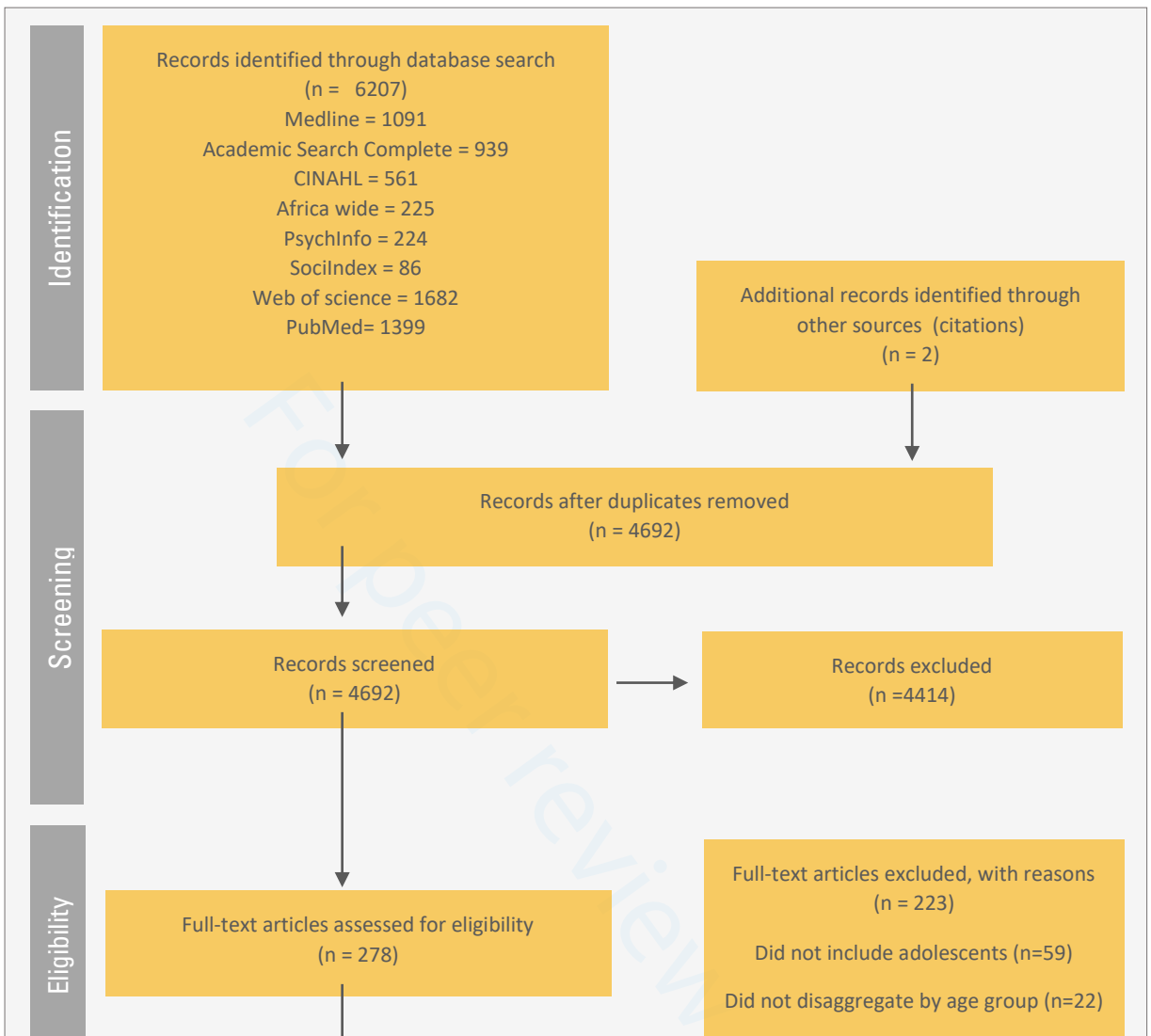

Figure 1: The PRISMA flow diagram describing the process of study selection.

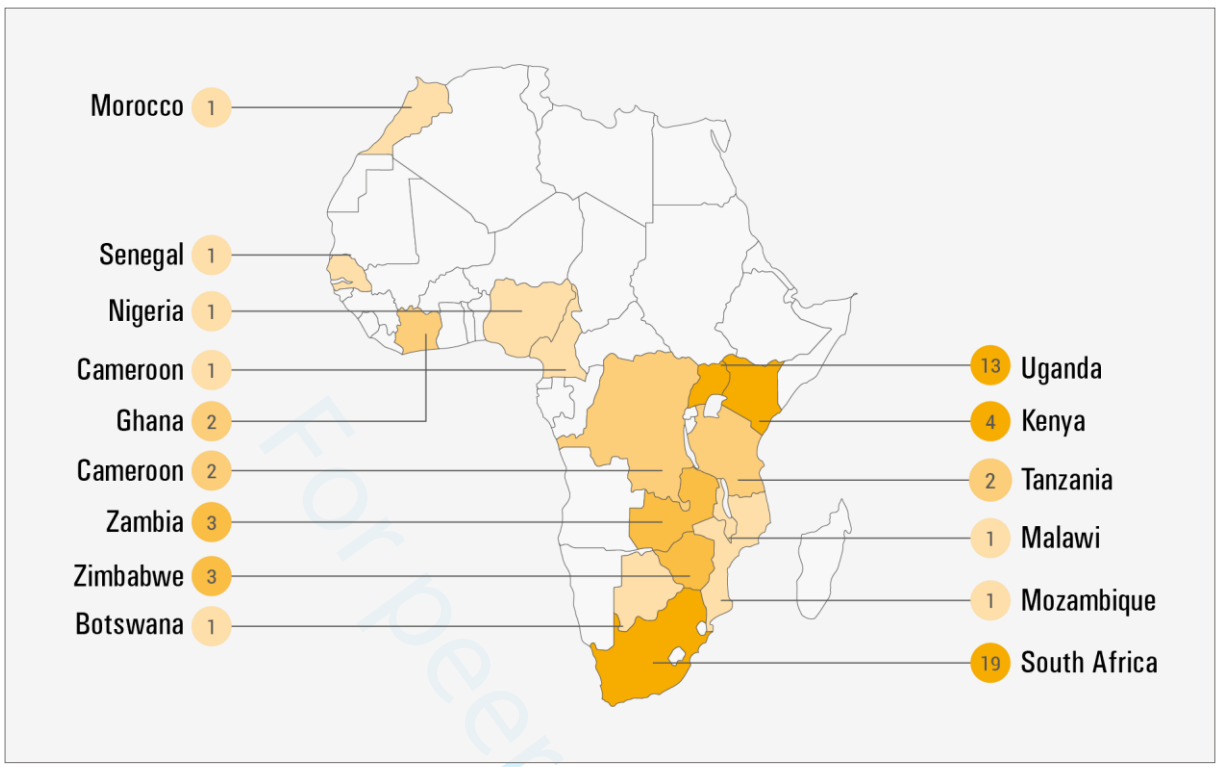

Figure 2: Study Location

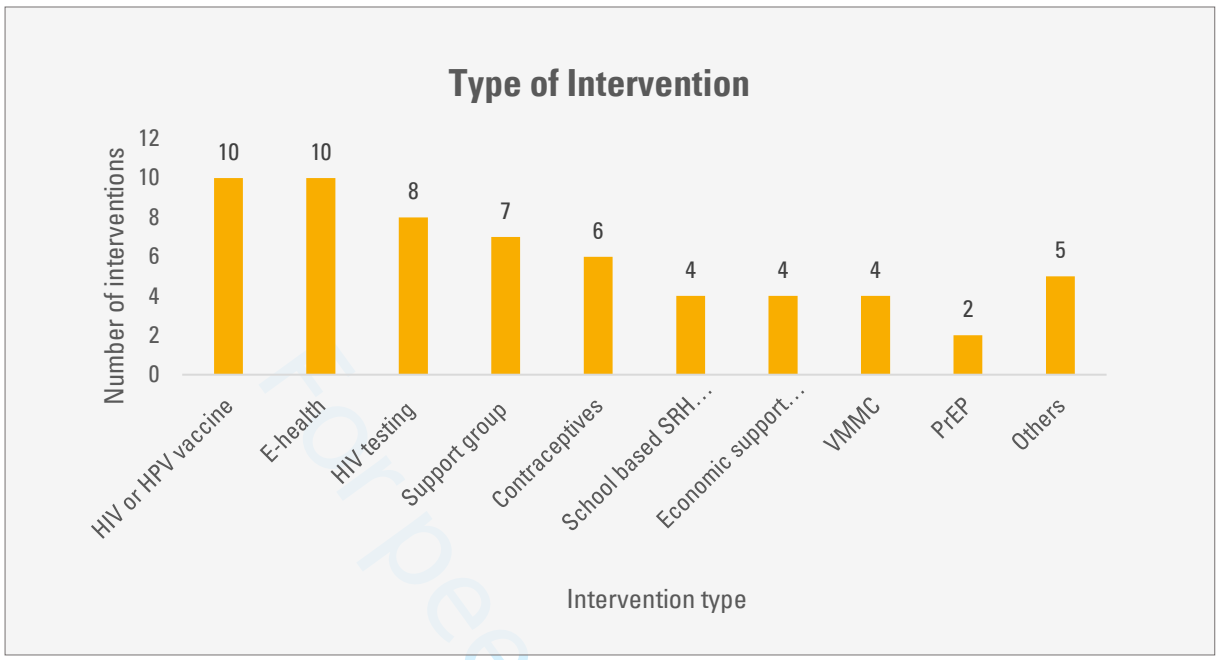

Figure 3: Intervention Types

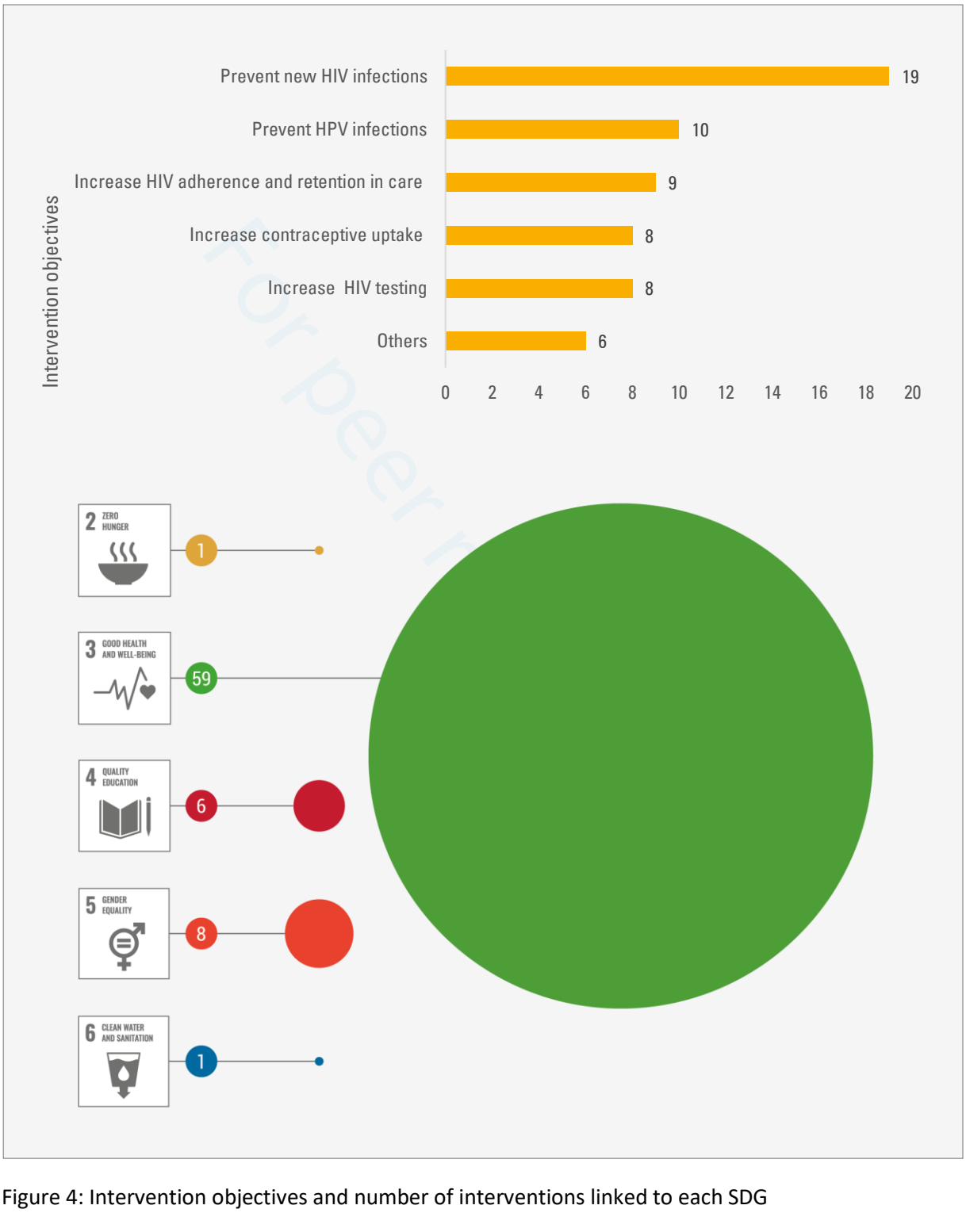

Figure 4: Intervention objectives and number of interventions linked to each SDG

Publication Year

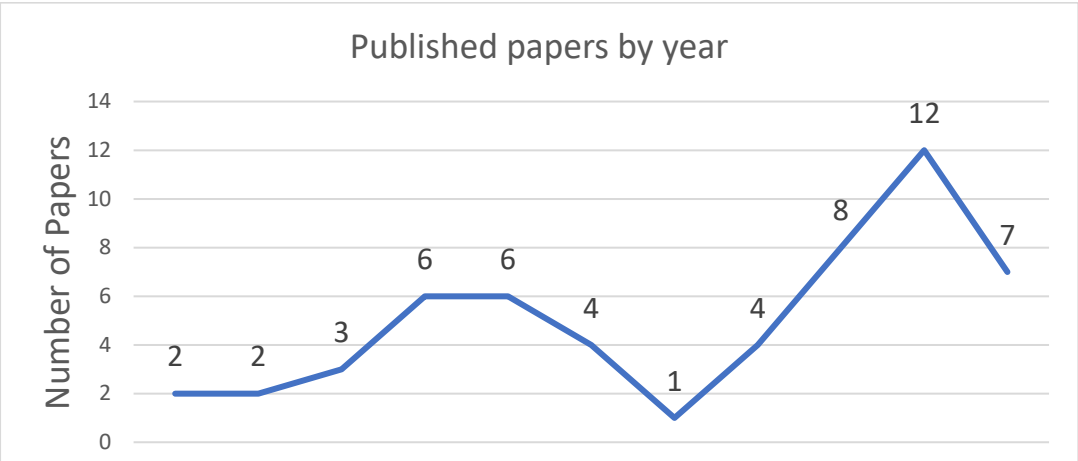

Table S1. Systematic Review Search Strategy

Search criteria (based on the Cochrane Collaboration's PICO criteria)	**Population:** adolescents or youth 10–24 years, living in Africa **Intervention:** primary research to determine adolescent and youth acceptability of one or more interventions aimed at improving their developmental outcomes (as per SDG indicators) **Comparison:** N/A **Outcomes:** adolescent acceptability findings, including: proportion of adolescents that find an intervention acceptable; information on what adolescents consider acceptable or not; reasons given for acceptability or lack of acceptability **Study or intervention design:** all types of study designs; no limiters on methodology
Example search term: search term used for EBSCOhost-linked databases	Adolescents or Youth: AB (youth OR "young person" OR "young people" OR "young women" OR "young men" OR "child*" OR "adoles*" OR "young adult" OR "teen*") AND Acceptability: AB (acceptable OR acceptability OR co-creat* OR "adolescent engagement" OR "youth engagement" OR "teen* engagement" OR "participant engagement" OR "adolescent participation" OR "youth participation" OR "teen* participation" OR "participant input" OR "adolescent input" OR "youth input" OR "teen* input" OR "participant feedback" OR "adolescent feedback" OR "youth feedback" OR "teen* feedback" OR "participant consultation" OR "adolescent consultation" OR "youth consultation" OR "teen* consultation" OR "participant advisory" OR "adolescent advisory" OR "youth advisory" OR "teen* advisory" OR "participatory research") AND Africa: AB (Africa* OR Algeria OR Angola OR Benin OR Botswana OR "Burkina Faso" OR Burundi OR Cameroon OR "Canary Islands" OR "Cape Verde" OR "Central African Republic" OR Chad OR Comoros OR Congo OR "Democratic Republic of Congo" OR Djibouti OR Egypt OR "Equatorial Guinea" OR Eritrea OR Ethiopia OR Gabon OR Gambia OR Ghana OR Guinea OR "Guinea Bissau" OR "Ivory Coast" OR "Cote d'Ivoire" OR Jamahiriya OR Jamahiryia OR Kenya OR Lesotho OR Liberia OR Libya OR Libia OR Madagascar OR Malawi OR Mali OR Mauritania OR Mauritius OR Mayote OR Morocco OR Mozambique OR Mocambique OR Namibia OR Niger OR Nigeria OR Principe OR Reunion OR Rwanda OR "Sao Tome" OR Senegal OR Seychelles OR "Sierra Leone" OR Somalia OR "St Helena" OR Sudan OR Swaziland OR Eswatini OR Tanzania OR Togo OR Tunisia OR

	Uganda OR “Western Sahara” OR Zaire OR Zambia OR Zimbabwe) NOT (“guinea pig” OR “guinea pigs” OR “aspergillus niger” OR “African American”)
Databases searched	Web of Science, Medline, PsychInfo, SociIndex, CINAHL, Africa-wide, Academic Search Complete and PubMed
Limiters	- Published between 1 January 2010 and 30 June 2020 - Peer-reviewed - English language

Authors	Title	Publication year
Atujuna et al	Contexts of vulnerability and the acceptab	2018
Ayissi et al	Awareness, Acceptability and Uptake of Hu	2012
Banda et al	Acceptability of an economic support com	2019
Barker et al	In-clinic adolescent peer group support for	2019
Bull et al	Cyber-Senga: Ugandan youth preferences f	2010
Busza et al	Meeting the needs of adolescents living wi	2014
Carney et al	Acceptability and feasibility of a brief subst	2020
Cele & Archary	Acceptability of short text messages to sup	2019
Chirwa-Kambole at al	Acceptability of youth clubs focusing on co	2020
Cover et al	Acceptability of Contraceptive Self-Injectio	2017
Dulli, et al	An Online Support Group Intervention for A	2018
Exavery et al	Acceptability of condom promotion and di	2012
Ferrand et al	Perception of Risk of Vertically Acquired HI	2011
Giovenco et al	"The time has arrived": perceptions of beh	2018
Hacking et al	Peer Mentorship via Mobile Phones for Ne	2019
Hector et al	Acceptability and performance of a directly	2018
Herman et al	Knowledge, Perceptions and Acceptability	2013
Hoque et al	Human Papillomavirus Vaccination Accepta	2013
James et al	Integrated access to care and treatment (I	2018
Jayeoba et al	Acceptability of male circumcision among a	2012
Kansiime et al	Menstrual health intervention and school a	2020
Katahoire et al	Acceptability of HPV vaccine among young	2013
Katz et al	A Qualitative Analysis of Factors Influencin	2013
Khosa, Zulu and Shung-Ki	Acceptability and feasibility of a school-bas	2019
Khoza et al	Cash transfer interventions for sexual heal	2018
Kibel et al	Acceptability of a Pilot Intervention of Volu	2018
Knopf et al	"This is the medicine:" A Kenyan communi	2014
Kuo et al	Acceptability, feasibility, and preliminary ef	2020
Laidlaw et al	Using participatory methods to design an r	2017
MacCarthy et al	A randomized controlled trial study of the a	2020
MacPhail et al	Acceptability and feasibility of cash transfe	2013
Madiba & Mokgatle	Students want HIV testing in schools" a for	2015
Mavhu et al	Is the PrePex device an alternative for surg	2019
Mburu et al	Knowledge of Cervical Cancer and Accepta	2019
Mitchell et al	Cell phone usage among adolescents in Ug	2011
Niasse et al	Adherence to ready-to-use food and accep	2020
Nuwasiima et al	Acceptability and utilization of family plan	2019
Parker et al	Feasibility analysis of an evidence-based pc	2013
Peltzer et al	Prevalence and Acceptability of Male Circu	2014
Rana et al	Short Message Service (SMS)-Based Interv	2015

Ritchwood et al	HIV self-testing: South African young adult	2019
Sabben et al	A Smartphone Game to Prevent HIV Amon	2019
Sayles et al	Future HIV Vaccine Acceptability Among Y	2010
Shanaube et al	Community intervention improves knowle	2017
Smith et al	Mobile sexual health services for adolesce	2019
Smith, Wallace & Bekker	Adolescents' experience of a rapid HIV self	2016
Snyder et al	Preliminary results from Hlanganani (Comi	2014
Tabong et al	Acceptability and stakeholders perspective	2018
Tonen-Wolyec et al	Acceptability, feasibility, and individual pre	2019
Turiho et al	Effect of School-based Human Papillomavi	2014
Turiho, Okello & Muhwez	Perceptions of human papillomavirus vacci	2017
Van der Straten et al	Feasibility and potential acceptability of th	2015
Ybarra et al	Acceptability and feasibility of CyberSenga	2014
Ybarra et al	Iterative Development of In This toGether,	2020
Zouheir et al	Knowledge of Human Papillomavirus and A	2015

NOTES

***** % range included when acceptability was assessed quantitatively through multip

Country	Setting	Sample size	Sample age range	Sample gender	Number of interventions tested
South Africa	Peri-urban	14	15-17	Female & Male	4
Cameroon	Not stated	551	14-23	Female	1
Zambia	Rural	16	NA	Female & Male	1
Ghana	Not stated	35	12-19	Female & Male	1
Uganda	Urban	15	NA	Female & Male	1
Tanzania	Rural & Urba	14	15-19	Female & Male	1
South Africa	Not stated	30	13-17	Female & Male	1
South Africa	Rural and urb	100	12-19	Female & Male	1
Zambia	Rural	68	13-18	Female & Male	1
Uganda	Ruran & Urba	46	15-19	Female	1
Nigeria	Not stated	349	15-24	Female & Male	1
Tanzania	Rural	1327	10-19	Female & Male	1
Zimbabwe	Urban	506	10-18	Female & Male	1
South Africa	Urban towns	57	16-17	Female & Male	1
South Africa	Periurban inf	110	12-25	Female & Male	1
Mozambique	Rural	496	16-20	Female & Male	1
Uganda	Urban, peri-u	808	12-20	Female & Male	1
South Africa	Not stated	440	20-21	Female	1
South Africa	Peri-urban	15	15-19	Female & Male	1
Botswana	Not stated	269	13-18	Male	1
Uganda	Periurban	369	13-21	Female & Male	1
Uganda	Not stated	422	10-15	Female	1
South Africa	Urban	201	12-19	Female & Male	1
South Africa	Rural	18	16-19	Female	1
South Africa	Urban	49	16-18	Female & Male	1
Kenya	Not stated	116	12-24	Male	1
Kenya	Semirural	13	18-24	Female & Male	1
South Africa	Urban	73	13-15	Female & Male	1
Malawi	Not stated	54	15-24	Female & Male	1
Uganda	Not stated	147	15-24	Female & Male	1
South Africa	Rural	29	14-17	Female	1
South Africa	Rural & Urba	2741	14-19	Female & Male	1
Zimbabwe	Not stated	618	13-17	Male	1
Kenya	Not stated	180	12-18	Female	3
Uganda	Urban	1503	12-18	Female & Male	1
Senegal	Not stated	89	12-18	Female & Male	1
Uganda	Urban slum	142	18-24	Female	1
Democratic Re	Not stated	13	15-24	Female & Male	1
South Africa	Urban & Rura	1489	15-24	Female & Male	1
Uganda	Urban	39	14-24	Female & Male	1

South Africa	Rural	95	18-24	Female & Male	1
Kenya	Not stated	30	11-14	Female & Male	1
South Africa	Not stated	42	18-24	Female & Male	1
Zambia	Not stated	11175	15-19	Female & Male	1
South Africa	Not stated	303	16-24	Female & Male	1
South Africa	Not stated	224	16-25	Female & Male	1
South Africa	Peri-urban	109	16-24	Female & Male	1
Ghana	Urban	79	12-17	Female & Male	1
Democratic Re	Urban	628	15-19	Female & Male	1
Uganda.	Rural & Urba	827	9-19	Female	1
Uganda	Not stated	43	13-16	Female	1
Zimbabwe	Not stated	45	16-21	Female	1
Uganda	Urban	366	13-19	Female & Male	1
Uganda	Urban and pe	376	18-22	Female & Male	1
Morocco	Urban	688	13-17	Female & Male	1

ole questions

Type of intervention (category)	Type of intervention (sub-type)	Key objective of intervention	SDGs
HIV Vaccine, Contraceptives,	HIV Vaccine, Vagir	To prevent new HI\	3
HPV Vaccine	HPV Vaccine	To prevent HPV inf	3
Economic support programs	Cash transfers	To increase contra	3, 4 & 5
Support group	Support group	To increase adhere	3
eHealth	Internet-based	To prevent new HI\	3 & 4
Others	Home based Care	To increase adhere	3
Others	Substance use	To reduce the prev	3
eHealth	SMS-based	To increase adhere	3
School based sexual and repr	School based sexu	To increase contra	3,4 & 5
Contraceptives	Injectable contrac	To increase contra	3 & 5
Support group	Support group	To increase adhere	3
Contraceptives	Condoms	To prevent new HI\	3
HIV testing	Provider initiated	To increase HIV tes	3
Other biomedical HIV preven	PrEP	To prevent new HI\	3
eHealth	SMS-based	To increase adhere	3
HIV testing	Self-testing	To increase HIV tes	3
School based sexual and repr	School based sexu	To increase contra	3,4 & 5
HPV Vaccine	HPV Vaccine	To prevent HPV inf	3
Support group	Support group	To increase adhere	3
Other biomedical HIV preven	VMMC	To prevent new HI\	3
School based sexual and repr	School based sexu	Improving menstr	6
HPV Vaccine	HPV Vaccine	To prevent HPV inf	3
HPV Vaccine	HPV Vaccine	To prevent HPV inf	3
Contraceptives	School-based con	To increase contra	3 & 5
Economic support programs	Cash transfers	To prevent new HI\	3
Other biomedical HIV preven	VMMC	To prevent new HI\	3
Support group	Support group	To prevent new HI\	3
Support group	Support group	To reduce HIV risk	3
eHealth	SMS-based	To provide health i	3
eHealth	SMS-based	To increase adhere	3
Economic support programs	Cash transfers	To prevent new HI\	3
HIV testing	School based	To increase HIV tes	3
Other biomedical HIV preven	VMMC	To prevent new HI\	3
HPV Vaccine, Cervical cancer	HPV Vaccine	To prevent HPV inf	3
eHealth	SMS-based	To prevent new HI\	3
Others	Nutrition/HIV	To reduce malnutri	2&3
Economic support programs	Non-cash strategy	To increase contra	3, 4 & 5
Support group	Support group	To provide psychos	3
Other biomedical HIV preven	VMMC	To prevent new HI\	3
eHealth	SMS-based	To increase adhere	3

HIV testing	Self-testing	To increase HIV tes	3
eHealth	Game-based	To prevent new HI\	3
HIV Vaccine	HIV Vaccine	To prevent new HI\	3
HIV testing	Home based	To increase HIV tes	3
HIV testing	Mobile clinic	To increase HIV tes	3
HIV testing	Self-testing	To increase HIV tes	3
Support group	Support group	To increase adhere	3
School based sexual and repr	School based sexu	To increase contra	3,4 & 5
HIV testing	Self-testing	To increase HIV tes	3
HPV Vaccine	HPV Vaccine	To prevent HPV inf	3
HPV Vaccine	HPV Vaccine	To prevent HPV inf	3
Contraceptives	Cervical barriers ((	To increase contra	3 & 5
eHealth	Internet-based	To prevent new HI\	3
eHealth	SMS-based	To prevent new HI\	3
HPV Vaccine	HPV Vaccine	To prevent HPV inf	3

Prospective, concurrent or retrospective acceptability	Explicit definition of acceptability	Conceptual framework used for acceptability	Study design	Methods used
Prospective	NA	NA	Qualitative	IDIs and FGDs
Prospective	NA	NA	Quantitative	Survey (Question
Concurrent	NA	NA	Qualitative	FGDs and IDIs
Concurrent	NA	NA	Qualitative	FGDs
Concurrent	NA	NA	Qualitative	FGDs
Retrospective	NA	NA	Qualitative	IDIs
Retrospective	NA	NA	Qualitative	IDIs
Prospective	NA	NA	Quantitative	Survey (Question
Retrospective	NA	NA	Qualitative	FGDs
Retrospective	NA	NA	Qualitative	IDIs
Concurrent	NA	NA	Qualitative	IDIs through Face
Prospective	NA	NA	Quantitative	Survey (Question
Concurrent	NA	NA	Mixed methods	Survey (open-end
Prospective	NA	NA	Mixed methods	Survey (Question
Retrospective	NA	NA	Qualitative	IDIs
Retrospective	NA	NA	Quantitative	Survey (Question
Prospective	NA	NA	Mixed methods	Survey (Question
Prospective	NA	NA	Quantitative	Survey (Question
Concurrent	NA	NA	Qualitative	IDIs
Prospective & Ret	NA	NA	Quantitative	Survey (structure
Concurrent	NA	NA	Mixed methods	FGDs and IDIs
Retrospective	Willingness or rel	NA	Qualitative	FGDs
Retrospective	NA	NA	Qualitative	IDIs
Prospective	NA	Social ecological	Qualitative	FGDs
Concurrent	NA	NA	Qualitative	IDIs
Retrospective	Perception amon	NA	Mixed methods	FGDs and survey
Concurrent	NA	NA	Qualitative	FGDs
Retrospective	NA	NA	Quantitative	Paper satisfactio
Prospective	NA	NA	Qualitative	FGDs
Concurrent	Cognitive and em	Sekhon et al's ac	Mixed methods	FGDs and Survey
Concurrent	NA	NA	Mixed methods	FGDs and Survey
Prospective	NA	NA	Quantitative	Survey (Question
Retrospective	NA	NA	Quantitative	Survey (Question
Prospective & Ret	NA	NA	Quantitative	Survey (Question
Prospective	NA	NA	Quantitative	Survey (Question
Concurrent	NA	NA	Mixed methods	FGDs and survey
Concurrent	NA	NA	Quantitative	Survey (Question
Concurrent	How the intende	Bowen Feasibility	Mixed methods	FGDs, activity she
Prospective	NA	NA	Quantitative	Survey (Question
Prospective	NA	NA	Mixed methods	FGDs, structured

Prospective & Ret	NA	NA	Mixed methods	FGDs; direct obse
Concurrent	Appeal, relevanc	NA	Mixed methods	Survey (Audio Co
Prospective	NA	Value-expectanc	Qualitative	FGDs
Concurrent	NA	NA	Quantitative	Survey (Househo
Concurrent	NA	NA	Quantitative	Survey (research
Retrospective	Preference for us	NA	Quantitative	Survey (administ
Prospective & Ret	NA	NA	Mixed methods	FGDs, attendanc
Prospective	NA	NA	Qualitative	FGDs
Prospective & Ret	Consenting to ar	NA	Quantitative	Survey (semi-stru
Prospective & Ret	NA	NA	Mixed methods	FGDs and survey
Retrospective	NA	Symbolic interact	Qualitative	FGDs
Retrospective	NA	NA	Mixed methods	FGDs and survey
Concurrent	NA	NA	Mixed methods	FGDs, surveys (ad
Prospective & Ret	NA	NA	Mixed methods	FGDs via Faceboo
Prospective	NA	NA	Quantitative	Survey (mix of fa

Indicators and questions	Overall acceptability high/low	% adolescents that found the intervention acceptable (if	Other stakeholders for whom acceptability
FGDs and IDI interview topic gui	High	NA	Healthcare Workers
Survey included questions on: pa	High	76	NA
Semi structured FGDs and IDIs e	High	NA	Community gate keepers
FGD semi structured interview g	High	NA	NA
FGDs covered: acceptability of th	High	NA	NA
Topic guides included: open-end	Low	NA	Primary caregivers and provi
No questions stated and not ver	High	NA	Caregivers
Survey probed whether: particip	High	65	NA
Semi-structured FGD guide explo	High	NA	Teachers
IDI semi structured interview gu	High	NA	NA
Semi structured IDI guide explor	High	NA	NA
Survey asked whether adolescer	Low	37	NA
Questionnaire assessed: reasons	High	99	Family members
Survey questions focused on wil	High	84-90	Clinical service providers
IDIs explored: what participants	High	NA	NA
Post-test questionnaire capture	High	85	NA
Survey assessed: proportion of p	High	96	Teachers
The questionnaire covered: beha	High	77	NA
No clear acceptability questions	High	NA	Facility Managers and suppor
Structured questionnaires includ	High	75	Parents/guardians
Specific acceptability questions r	High	NA	Teachers and parents
FGDs explored reasons for being	High	NA	NA
Interviews covered: contextual i	High	NA	Caregivers
FGD topic guide asked: how part	Low	NA	Parents
Interviews focused on topics suc	High	NA	
The questionnaire consisted of 1	High	81-99	NA
FGD questions focused on whetl	High	NA	Community leaders
Participants ranked intervention	High	100	Parents
FGDs covered: participants opini	High	NA	Adults aged 22-50 years from
FGDs covered: whether participa	High	88-97	Providers, counsellors, pharn
FGDs covered: whether participa	High	NA	Caregivers
Questionnaire included 2 main a	High	77	NA
Questionnaire items included: re	High	95-97	NA
Through the survey adolescents	High	64	NA
The questionnaire covered: 1) ac	High	51-61	NA
The structured questionnaire co	High	79-87	Caregivers
Survey assessed: willingness to j	High	93	
FGDs covered satisfaction with t	High	NA	Facilitators
Men and women were asked ab	High	46-61	NA
FGDs covered: general reaction t	High	97	NA

Semi-structured focus group the	High	80-100	NA
The survey included questions o	High	67-97	Parents
Semi-structured FGDs covered: v	High	NA	NA
The question was a binary quest	High	81	NA
An 11-item scale, developed from	High	90	NA
3-item acceptability scale assess	High	90-99	NA
Formative phase FGDs explored	High	85	NA
FGD topic guides explored: adol	High	NA	Ghana Education Service Pro
Survey included questions on: re	High	95	Peer educators
FGDs discussed girls' observatio	High	89-93	NA
FGD questions included: underst	High	NA	Health workers, community l
FGDs explored attitudes about a	High	71-93	NA
Topic guides for FGDs explored:	High	77-94	NA
FGD topics queried issues relate	High	NA	NA
Survey included 2 questions to a	Low	27	NA

ders

rt group facilitators

ı the same 2 villages
nacist, client rep, and study coordinators

gram Managers Heads of Basic Educational SchoolsGhana Health Service ASRH Program Mana

leaders, teachers and parents

agers Population Council Representative Members of Ghana Psychologist Association UNESC(

Ɔ Representative Teachers

Type of intervention (sub-type)	Authors	Paper Title	Publication year
HIV Vaccine	Sayles et al	Future HIV Vaccine Acceptability	2010
HIV Vaccine	Atujuna et al	Contexts of vulnerability and the	2018
HPV Vaccine	Turiho et al	Effect of School-based Human P	2014
HPV Vaccine	Turiho, Okello & Muhwez	Perceptions of human papilloma	2017
HPV Vaccine	Zouheir et al	Knowledge of Human Papilloma	2015
HPV Vaccine	Mburu et al	Knowledge of Cervical Cancer an	2019
HPV Vaccine	Hoque et al	Human Papillomavirus Vaccinatic	2013
HPV Vaccine	Ayissi et al	Awareness, Acceptability and Up	2012
HPV Vaccine	Katz et al	A Qualitative Analysis of Factors	2013
HPV Vaccine	Katahoire et al	Acceptability of HPV vaccine am	2013

Country	Setting (e.g. urban or rural)	Sample size	Sample age range	Sample gender	Key objective of intervention
South Africa	Not stated	42	18-24	Male & Female	To prevent new HIV i
South Africa	Peri-urban	14	15-17	Male & Female	To prevent new HIV i
Uganda.	Rural & Urban	827	9-19	Females	To prevent HPV infec
Uganda	Not stated	43	13-16	Females	To prevent HPV infec
Morocco	Urban	688	13-17	Male & Female	To prevent HPV infec
Kenya	Not stated	180	12-18	Females	To prevent HPV infec
South Africa	Not stated	440	20-21	Females	To prevent HPV infec
Cameroon	Not stated	551	14-23	Females	To prevent HPV infec
South Africa	Urban	201	12-19	Male & Female	To prevent HPV infec
Uganda	Not stated	422	10-15	Females	To prevent HPV infec

SDGs	Prospective, concurrent or retrospective acceptability	Explicit definition of acceptability	Conceptual framework used for acceptability	Study design
3	Prospective	NA	Value-expectancy an	Qualitative
3	Prospective	NA	NA	Qualitative
3	Prospective & Retro	NA	NA	Mixed methods
3	Retrospective	NA	Symbolic interaction	Qualitative
3	Prospective	NA	NA	Quantitative
3	Prospective	NA	NA	Quantitative
3	Prospective	NA	NA	Quantitative
3	Prospective	NA	NA	Quantitative
3	Retrospective	NA	NA	Qualitative
3	Retrospective	Willingness or relu	NA	Qualitative

Methods used	Indicators and questions used	Overall acceptability	% adolescents that found the intervention acceptable (if reported)	Other stakeholders for which acceptability was assessed
FGDs	Semi-structured FGD	High	NA	NA
IDIs and FGDs	FGDs and IDI intervie	High	NA	Healthcare Workers
FGDs and survey	FGDs discussed girls'	High	89-93	NA
FGDs	FGD questions incluc	High	NA	Health workers, commu
Survey (mix of fa	Survey included 2 qu	Low	27	NA
Survey (Questior	Through the survey a	High	63.6	NA
Survey (Questior	The questionnaire cc	High	77	NA
Survey (Questior	Survey included que:	High	76	NA
IDIs	Interviews covered: (	High	NA	Caregivers
FGDs	FGDs explored reaso	High	NA	NA

unity leaders, teachers and parents

Type of intervention (sub-type)	Authors	Paper Title
Game-based	Sabben et al	A Smartphone Game to Prevent HIV Among
Internet-based	Bull et al	Cyber-Senga: Ugandan youth preferences for conte
Internet-based	Ybarra et al	Acceptability and feasibility of CyberSenga, an Inter
SMS-based	Laidlaw et al	Using participatory methods to design an mHealth i
SMS-based	Hacking et al	Diagnosed HIV-Positive Youths in Clinic Care in
SMS-based	Mitchell et al	Cell phone usage among adolescents in Uganda: ac
SMS-based	Rana et al	Short Message Service (SMS)-Based Intervention to
SMS-based	Ybarra et al	Iterative Development of In This toGether, the First
SMS-based	Cele & Archary	Acceptability of short text messages to support tre
SMS-based	MacCarthy et al	A randomized controlled trial study of the acceptab

Publication year	Country	Setting	Sample size	Sample age range	Sample gender
2019	Kenya	Not stated	30	11-14	Female & Male
2010	Uganda	Urban	15	NA	Female & Male
2014	Uganda	Urban	366	13-19	Female & Male
2017	Malawi	Not stated	54	15-24	Female & Male
2019	South Africa	Periurban inform	110	12-25	Female & Male
2011	Uganda	Urban	1503	12-18	Female & Male
2015	Uganda	Urban	39	14-24	Female & Male
2020	Uganda	Urban and periur	376	18-22	Female & Male
2019	South Africa	Rural and urban	100	12-19	Female & Male
2020	Uganda	Not stated	147	15-24	Female & Male

Key objective of intervention	SDGs	Prospective, concurrent or retrospective acceptability	Explicit definition of acceptability	Conceptual framework used for acceptability
To prevent new HIV ir	3	Concurrent	Appeal, relevance,	NA
To prevent new HIV ir	3 & 4	Concurrent	NA	NA
To prevent new HIV ir	3	Concurrent	NA	NA
To provide health infc	3	Prospective	NA	NA
To increase adherenc	3	Retrospective	NA	NA
To prevent new HIV ir	3	Prospective	NA	NA
To increase adherenc	3	Prospective	NA	NA
To prevent new HIV ir	3	Prospective & Re	NA	NA
To increase adherenc	3	Prospective	NA	NA
To increase adherenc	3	Concurrent	Cognitive and emot	Sekhon et al's acc

Study design	Methods used
Mixed methods	Survey (Audio Comput
Qualitative	FGDs
Mixed methods	FGDs, surveys (adminis
Qualitative	FGDs
Qualitative	IDIs
Quantitative	Survey (Questionnaire)
Mixed methods	FGDs, structured surve
Mixed methods	FGDs via Facebook anc
Quantitative	Survey (Questionnaire)
Mixed methods	FGDs and Survey (Ques

Indicators and questions used	Overall acceptability
The survey included questions on: the game's appeal,	High
FGDs covered: acceptability of the concept of an Interne	High
experiences with the program, including: likes and	High
FGDs covered: participants opinion of receiving health in	High
IDIs explored: what participants understood by the Virtu	High
The questionnaire covered: 1) actual access of health infc	High
phone related issues; familiarity and comfort with text	High
protocol, ideas for the name of the intervention, the	High
Survey probed whether: participants would be willing to	High
intervention; how they felt about it; whether they	High

% adolescents that found the intervention acceptable (if reported)	Other stakeholders for which acceptability was assessed
67-97	Parents
NA	NA
77-94	NA
NA	Adults aged 22-50 years from the same 2 villages
NA	NA
51-61	NA
97	NA
NA	NA
65	NA
88-97	Providers, counsellors, pharmacist, client rep, and study coordi

inators

Type of intervention (sub-type)	Authors	Paper Title	Publication year
Self-testing	Smith, Wallace & Be	Adolescents' experience of a	2016
Self-testing	Ritchwood et al	HIV self-testing: South Africa	2019
Self-testing	Hector et al	Acceptability and performan	2018
Self-testing	Tonen-Wolyec et al	Acceptability, feasibility, and	2019
Home based	Shanaube et al	Community intervention imp	2017
School based	Madiba & Mokgatle	Students want HIV testing in	2015
Mobile clinic	Smith et al	Mobile sexual health service	2019
Provider initiated	Ferrand et al	Perception of Risk of Vertica	2011

Country	Setting (e.g. urban or rural)	Sample size	Sample age range
South Africa	Not stated	224	16-25
South Africa	Rural	95	18-24
Mozambique	Rural	496	16-20
Democratic Republic o	Urban	628	15-19
Zambia	Not stated	11175	15-19
South Africa	Rural & Urban	2741	14-19
South Africa	Not stated	303	16-24
Zimbabwe	Urban	506	10-18

Sample gender	Key objective of intervention	SDGs	Prospective, concurrent or retrospective acceptability	Explicit definition of acceptability
Male & Female	To increase HIV testing	3	Retrospective	Preference for using
Male & Female	To increase HIV testing	3	Prospective & Retro	NA
Male & Female	To increase HIV testing	3	Retrospective	NA
Male & Female	To increase HIV testing	3	Prospective & Retro	Consenting to and u
Male & Female	To increase HIV testing	3	Concurrent	NA
Male & Female	To increase HIV testing	3	Prospective	NA
Male & Female	To increase HIV testing	3	Concurrent	NA
Male & Female	To increase HIV testing	3	Concurrent	NA

Conceptual framework used for acceptability	Study design	Methods used	Indicators and questions used
NA	Quantitative	Survey (administered	3-item acceptabil
NA	Mixed methods	FGDs; direct observat	Semi-structured t
NA	Quantitative	Survey (Questionnair	Post-test questio
NA	Quantitative	Survey (semi-structur	Survey included c
NA	Quantitative	House-hold survey	The question was
NA	Quantitative	Survey (Questionnair	Questionnaire inc
NA	Quantitative	Survey (researcher ac	An 11-item scale,
NA	Mixed methods	Open-ended question	Questionnaire as

Overall acceptability	% adolescents that found the intervention acceptable (if reported)	Other stakeholders for which acceptability was assessed
High	90-99	NA
High	80-100	NA
High	85	NA
High	95	Peer educators
High	81	NA
High	77	NA
High	90	NA
High	99	Family members

Authors	Paper Title	Publication year	Country
Barker et al	In-clinic adolescent peer group sup	2019	Ghana
Dulli, et al	An Online Support Group Intervent	2018	Nigeria
Snyder et al	Preliminary results from Hlanganan	2014	South Africa
Knopf et al	"This is the medicine:" A Kenyan cc	2014	Kenya
Parker et al	Feasibility analysis of an evidence-b	2013	Democratic Repul
Kuo et al	Acceptability, feasibility, and prelim	2020	South Africa
James et al	Integrated access to care and treat	2018	South Africa

Setting (e.g. urban or rural)	Sample size	Sample age range	Sample gender	Key objective of intervention	SDGs
Not stated	35	12-19	Male & Female	To increase adherence ar	3
Not stated	349	15-24	Male & Female	To increase adherence ar	3
Peri-urban	109	16-24	Male & Female	To increase adherence ar	3
Semirural	13	18-24	Male & Female	To prevent new HIV infec	3
Not stated	13	15-24	Male & Female	To provide psychosocial :	3
Urban	73	13-15	Male & Female	To reduce HIV risk behav	3
Peri-urban	15	15-19	Male & Female	To increase adherence ar	3

Prospective, concurrent or retrospective acceptability	Explicit definition of acceptability	Conceptual framework used for acceptability	Study design	Methods used
Concurrent	NA	NA	Qualitative	FGDs
Concurrent	NA	NA	Qualitative	IDIs through Facebook
Prospective and Ret	NA	NA	Mixed methods	FGDs, attendance regist
Concurrent	NA	NA	Qualitative	FGDs
Concurrent	How the intend	Bowen Feasibili	Mixed methods	FGDs, activity sheets/ ev
Retrospective	NA	NA	Quantitative	Survey (Paper satisfacti
Concurrent	NA	NA	Qualitative	IDIs

Indicators and questions used	Overall acceptability	% adolescents that found the intervention acceptable (if	Other stakeholders for which acceptability
FGD semi structur	High	NA	NA
Semi structured ID	High	NA	NA
Formative phase F	High	85	NA
FGD questions foc	High	NA	Community leaders
FGDs covered sati	High	NA	Facilitators
Participants ranke	High	100	Parents
No clear acceptab	High	NA	Facility Managers and support grou

p facilitators

Type of intervention (sub-type)	Authors	Paper Title
Condoms	Exavery et al	Acceptability of condor
Condoms	Mburu et al	Knowledge of Cervical
School-based contraceptive clinic (SBCC)	Khosa, Zulu and Shung-Ki	Acceptability and feasil
Injectable contraception	Cover et al	Acceptability of Contra
Cervical barriers (CB) - (Ortho All-Flex® diaphr	Van der Straten et al	Feasibility and potentia
Vaginal rings	Atujuna et al	Contexts of vulnerabilit

Publication year	Country	Setting	Sample size	Sample age range	Sample gender
2012	Tanzania	Rural	1327	10-19	Male & Female
2019	Kenya	Not stated	180	12-18	Females
2019	South Africa	Rural	18	16-19	Female
2017	Uganda	Ruran & Urban	46	15-19	Female
2015	Zimbabwe	Not stated	45	16-21	Female
2018	South Africa	Peri-urban	14	15-17	Male & Female

Key objective of intervention	SDGs	Prospective, concurrent or retrospective acceptability	Explicit definition	Conceptual framework used for acceptability	Study design
To prevent new HIV	3	Prospective	NA	NA	Quantitative
To prevent HPV infe	3	Prospective	NA	NA	Quantitative
To increase contrac	3 & 5	Prospective	NA	Social ecological fr	Qualitative
To increase contrac	3 & 5	Retrospective	NA	NA	Qualitative
To increase contrac	3 & 5	Retrospective	NA	NA	Mixed methods
To prevent new HIV	3	Prospective	NA	NA	Qualitative

Methods used	Indicators and questions used	Overall acceptability	% adolescents that found the intervention acceptable (if
Survey (Questionn	Survey asked wheth	Low	37
Survey (Questionn	Through the survey a	High	64
FGDs	FGD topic guide aske	Low	NA
IDIs	IDI semi structured i	High	NA
FGDs and survey (s	FGDs explored attitu	High	71-93
IDIs and FGDs	FGDs and IDI intervie	High	NA

Other stakeholders for which acceptability was assessed
NA
NA
Parents
NA
NA
Healthcare workers

Authors	Paper Title	Publication year	Country	Setting	Sample size
Chirwa-Kambole	Acceptability of youth	2020	Zambia	Rural	68
Herman et al	Knowledge, Perceptio	2013	Uganda	Urban, peri-urbar	808
Kansiime et al	Menstrual health inte	2020	Uganda	Periurban	369
Tabong et al	Acceptability and stak	2018	Ghana	Urban	79

Sample age range	Sample gender	Key objective of intervention	SDGs	Prospective, concurrent or retrospective acceptability
13-18	Female & Male	To increase contrace	3,4 & 5	Retrospective
12-20	Female & Male	To increase contrace	3,4 & 5	Prospective
13-21	Female & Male	To improve menstru	6	Concurrent
12-17	Female & Male	To increase contrace	3,4 & 5	Prospective

Explicit definition of acceptability	Conceptual framework used for acceptability	Study design	Methods used	Indicators and questions used
NA	NA	Qualitative	FGDs	Semi-structured FC
NA	NA	Mixed methods	Survey (Ques	Survey assessed: p
NA	NA	Mixed methods	FGDs and IDI	Specific acceptabil
NA	NA	Qualitative	FGDs	FGD topic guides e

Overall acceptability	% adolescents that found the intervention acceptable (if reported)	Other stakeholders for which acceptability was assessed
High	NA	Teachers
High	96	Teachers
High	NA	Teachers and parents
High	NA	Ghana Education Service Program Managers Heads o

f Basic Educational SchoolsGhana Health Service ASRH Program Managers Population Council Re|

presentative Members of Ghana Psychologist Association UNESCO Representative Teachers

Type of intervention	Authors	Paper Title	Publication year
Cash transfers	Banda et al	Acceptability of ar	2019
Cash transfers	Khoza et al	Cash transfer inte	2018
Cash transfers	MacPhail et al	Acceptability and	2013
Family planning benefit cards	Nuwasiima et al	Acceptability and	2019

Country	Setting (e.g. urban or rural)	Sample size	Sample age range	Sample gender
Zambia	Rural	16	NA	Female & Male
South Africa	Urban	49	16-18	Female & Male
South Africa	Rural	29	14-17	Female
Uganda	Urban slum	142	18-24	Female

Key objective of intervention	SDGs	Prospective, concurrent or retrospective acceptability	Explicit definition of acceptability	Conceptual framework used for acceptability
To increase contracept	3, 4 & 5	Concurrent	NA	NA
To prevent new HIV inf	3	Concurrent	NA	NA
To prevent new HIV inf	3	Concurrent	NA	NA
To increase contracept	3, 4 & 5	Concurrent	NA	NA

Study design	Methods used	Indicators and questions used	Overall acceptability	% adolescents that found the intervention acceptable (if
Qualitative	FGDs and IDIs	Semi structured FGDs	High	NA
Qualitative	IDIs	Interviews focused or	High	NA
Mixed methods	FGDs and Survey	FGDs covered: wheth	High	NA
Quantitative	Survey (Questior	Survey assessed: willi	High	93

Other stakeholders for which acceptability was assessed	Community gate keepers NA Caregivers NA

Type of intervention (sub-type)	Authors	Paper Title	Publication year	Country
VMMC	Jayeoba et al	Acceptability of male cir	2012	Botswana
VMMC	Kibel et al	Acceptability of a Pilot I	2018	Kenya
VMMC	Mavhu et al	Is the PrePex device an	2019	Zimbabwe
VMMC	Peltzer et al	Prevalence and Accepta	2014	South Africa

Setting	Sample size	Sample age range	Sample gender	Key objective of intervention	SDGs
Not stated	269	13-18	Male	To prevent new HIV infe	3
Not stated	116	12-24	Male	To prevent new HIV infe	3
Not stated	618	13-17	Male	To prevent new HIV infe	3
Urban & Rural	1489	15-24	Female & I	To prevent new HIV infe	3

Prospective, concurrent or retrospective acceptability	Explicit definition of acceptability	Conceptual framework used for acceptability	Study design	Methods used
Prospective & Retr	NA	NA	Quantitative	Structured questic
Retrospective	Perception among st	NA	Mixed methods	FGDs and survey (c
Retrospective	NA	NA	Quantitative	Survey (Questionn
Prospective	NA	NA	Quantitative	Survey (Questionn

Indicators and questions used	Overall acceptability	% adolescents that found the intervention acceptable (if reported)	Other stakeholders for which acceptability was assessed
Structured questic	High	75	Parents/guardians
The questionnaire	High	81-99	NA
Questionnaire iter	High	95-97	NA
Men and women v	High	46-61	NA

Type of intervention (sub-type)	Authors	Paper Title	Publication year	Country	Setting	Sample size
PrEP	Atujuna et al	Contexts of v	2018	South Africa	Peri-urban	14
PrEP	Giovenco et a	"The time ha	2018	South Africa	Urban towns	57

Sample age range	Sample gender	Key objective of intervention	SDGs	Prospective, concurrent or retrospective acceptability	Explicit definition of acceptability
15-17	Female & Ma	To prevent new	3	Prospective	NA
16-17	Female & Ma	To prevent new	3	Prospective	NA

Conceptual framework used for acceptability	Study design	Methods used	Indicators and questions used	Overall acceptability	% adolescents that found the intervention acceptable (if
NA	Qualitative	IDIs and FGD:	FGDs and IDI	High	NA
NA	Mixed metho	Survey (Ques	Survey quest	High	84-90

Other stakeholders for which acceptability was assessed	Healthcare workers Clinical service providers

Type of intervention (sub-type)	Authors	Paper Title	Publication year	Country
Rectal microbicide	Atujuna et al	Contexts c	2018	South Africa
Home based Care	Busza et al	Meeting th	2014	Tanzania
Substance use preventic	Carney et al	Acceptabil	2020	South Africa
Cervical cancer screenin	Mburu et al	Knowledg	2019	Kenya
Nutrition/HIV	Niasse et al	Adherence	2020	Senegal

Setting	Sample size	Sample age range	Sample gender	Key objective of intervention	SDGs
Peri-urban	14	15-17	Female & M	To prevent new HIV infections	3
Rural & Urban	14	15-19	Female & M	To increase adherence and ret	3
Not stated	30	13-17	Female & M	To reduce the prevalence of su	3
Not stated	180	12-18	Females	To prevent HPV infection	3
Not stated	89	12-18	Female & M	To reduce malnutriction amon	2&3

Prospective, concurrent or retrospective acceptability	Explicit definition of acceptability	Conceptual framework used for acceptability	Study design	Methods used
Prospective	NA	NA	Qualitative	IDIs and FGDs
Retrospective	NA	NA	Qualitative	IDIs
Retrospective	NA	NA	Qualitative	IDIs
Prospective	NA	NA	Quantitative	Survey (Questionna
Concurrent	NA	NA	Mixed methods	FGDs and survey (s

Indicators and questions used	Overall acceptability	% adolescents that found the intervention acceptable (if	Other stakeholders for which acceptability
FGDs and IDI intervie	High	NA	Healthcare workers
Topic guides include	Low	NA	Primary caregivers and providers
No questions stated	High	NA	Caregivers
Through the survey a	High	63.6	NA
The structured quest	High	79-87	Caregivers

PRISMA 2020 Checklist

Section and Topic	Item #	Checklist item	Location where item is reported
TITLE			
Title	1	Identify the report as a systematic review.	Pg. 1
ABSTRACT			
Abstract	2	See the PRISMA 2020 for Abstracts checklist.	Pg. 2
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of existing knowledge.	Pg. 5
Objectives	4	Provide an explicit statement of the objective(s) or question(s) the review addresses.	Pg. 5
METHODS			
Eligibility criteria	5	Specify the inclusion and exclusion criteria for the review and how studies were grouped for the syntheses.	Pg. 5,6
Information sources	6	Specify all databases, registers, websites, organisations, reference lists and other sources searched or consulted to identify studies. Specify the date when each source was last searched or consulted.	Pg. 6
Search strategy	7	Present the full search strategies for all databases, registers and websites, including any filters and limits used.	Table S1
Selection process	8	Specify the methods used to decide whether a study met the inclusion criteria of the review, including how many reviewers screened each record and each report retrieved, whether they worked independently, and if applicable, details of automation tools used in the process.	Pg. 6
Data collection process	9	Specify the methods used to collect data from reports, including how many reviewers collected data from each report, whether they worked independently, any processes for obtaining or confirming data from study investigators, and if applicable, details of automation tools used in the process.	Pg. 6
Data items	10a	List and define all outcomes for which data were sought. Specify whether all results that were compatible with each outcome domain in each study were sought (e.g. for all measures, time points, analyses), and if not, the methods used to decide which results to collect.	NA
	10b	List and define all other variables for which data were sought (e.g. participant and intervention characteristics, funding sources). Describe any assumptions made about any missing or unclear information.	NA
Study risk of bias assessment	11	Specify the methods used to assess risk of bias in the included studies, including details of the tool(s) used, how many reviewers assessed each study and whether they worked independently, and if applicable, details of automation tools used in the process.	NA
Effect measures	12	Specify for each outcome the effect measure(s) (e.g. risk ratio, mean difference) used in the synthesis or presentation of results.	NA
Synthesis methods	13a	Describe the processes used to decide which studies were eligible for each synthesis (e.g. tabulating the study intervention characteristics and comparing against the planned groups for each synthesis (item #5)).	Pg. 6
	13b	Describe any methods required to prepare the data for presentation or synthesis, such as handling of missing summary statistics, or data conversions.	NA
	13c	Describe any methods used to tabulate or visually display results of individual studies and syntheses.	NA
	13d	Describe any methods used to synthesize results and provide a rationale for the choice(s). If meta-analysis was performed, describe the model(s), method(s) to identify the presence and extent of statistical heterogeneity, and software package(s) used.	NA
	13e	Describe any methods used to explore possible causes of heterogeneity among study results (e.g. subgroup analysis, meta-regression).	NA
	13f	Describe any sensitivity analyses conducted to assess robustness of the synthesized results.	NA
Reporting bias assessment	14	Describe any methods used to assess risk of bias due to missing results in a synthesis (arising from reporting biases).	NA
Certainty	15	Describe any methods used to assess certainty (or confidence) in the body of evidence for an outcome.	NA

PRISMA 2020 Checklist

Section and Topic	Item #	Checklist item	Location where item is reported
assessment			
RESULTS			
Study selection	16a	Describe the results of the search and selection process, from the number of records identified in the search to the number of studies included in the review, ideally using a flow diagram.	Pg. 6
	16b	Cite studies that might appear to meet the inclusion criteria, but which were excluded, and explain why they were excluded.	NA
Study characteristics	17	Cite each included study and present its characteristics.	Pg. 7
Risk of bias in studies	18	Present assessments of risk of bias for each included study.	NA
Results of individual studies	19	For all outcomes, present, for each study: (a) summary statistics for each group (where appropriate) and (b) an effect estimate and its precision (e.g. confidence/credible interval), ideally using structured tables or plots.	NA
Results of syntheses	20a	For each synthesis, briefly summarise the characteristics and risk of bias among contributing studies.	NA
	20b	Present results of all statistical syntheses conducted. If meta-analysis was done, present for each the summary estimate and its precision (e.g. confidence/credible interval) and measures of statistical heterogeneity. If comparing groups, describe the direction of the effect.	NA
	20c	Present results of all investigations of possible causes of heterogeneity among study results.	NA
	20d	Present results of all sensitivity analyses conducted to assess the robustness of the synthesized results.	NA
Reporting biases	21	Present assessments of risk of bias due to missing results (arising from reporting biases) for each synthesis assessed.	NA
Certainty of evidence	22	Present assessments of certainty (or confidence) in the body of evidence for each outcome assessed.	NA
DISCUSSION			
Discussion	23a	Provide a general interpretation of the results in the context of other evidence.	Pg. 11
	23b	Discuss any limitations of the evidence included in the review.	Pg. 13
	23c	Discuss any limitations of the review processes used.	Pg. 13
	23d	Discuss implications of the results for practice, policy, and future research.	Pg. 13-14
OTHER INFORMATION			
Support	25	Describe sources of financial or non-financial support for the review, and the role of the funders or sponsors in the review.	Pg. 15
Competing interests	26	Declare any competing interests of review authors.	Pg. 15
Availability of data, code and other materials	27	Report which of the following are publicly available and where they can be found: template data collection forms; data extracted from included studies; data used for all analyses; analytic code; any other materials used in the review.	NA