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Family-based interventions in youth to prevent HIV/AIDS: A systematic review

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Abstract:

Parents are primary sex educators of their teenagers and also function as resources for advice and information about sexual decision-making and partner selection. So far, various family-based programs were carried out to prevent HIV infection in young people; however, their findings are contradictory and inconclusive. Therefore, we carried out the current systematic review to critically review the available literature regarding the role of family-based interventions among young people to prevent HIV infection. The available online databases including ISI Web of Science, Scopus, and PubMed were searched systematically up to November 2022. The risk of bias in the eligible studies was examined by two independent authors using the Cochrane Collaboration Risk of Bias tool. A total of 7 studies including 4952 participants were enrolled in the current study. They were conducted between 2006 and 2020. On the basis of the available literature, family-based HIV prevention interventions seem to be effective in terms of improving HIV/AIDS knowledge and also parent–youth communication. It seems that family-based interventions in youth to prevent HIV/AIDS are effective; however, further well-designed studies are needed to help the researchers reach a firm conclusion on this issue. The current systematic review may be used by investigators for future studies in terms of settings and the selection of educational approaches. Moreover, it strongly suggested that further studies investigating the role of family-based education in the prevention of HIV/AIDS utilize more sample size and also a more robust educational framework.

Keywords:

AIDS, education, HIV, sex education, systematic review

Introduction

Adolescents and young people are the fastest-growing populations at risk for human immunodeficiency virus (HIV)/acquired immunodeficiency syndrome (AIDS) in developing and developed countries.^[1] Young people are now at the center of the AIDS epidemic; around 50% of the people with a diagnosis of HIV become infected before they turn 25, and also 25% of other sexually transmitted diseases (STDs) reported annually occur among this group.^[1,2] It is currently the leading cause of death among 15–24-year-old individuals.^[2] Most young

people acquire HIV via unprotected sexual activity and also substance use due to its role in impairing decision-making and inaccurate use of a condom. A national survey in the USA revealed that only 48.5% of females and 67% of males reported condom use during their last sexual intercourse, while 62.3% of females and 60.7% reported having sexual intercourse by 12th grade.^[3] Moreover, 33.5% of males and 17.6% of females report using drugs or alcohol before the last sexual intercourse.^[3,4]

The first generation of HIV prevention programs for young people relied on increasing knowledge of this population

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regarding the prevention and transmission of HIV; however, this approach did not directly lead to behavior change.^[5,6] The second generation of HIV prevention programs went beyond increasing knowledge and works using social cognitive theories to address condom use skills, assertive communication, safer-sex intentions, and perceptions of risk in combination with knowledge. However, this approach also failed to provide long-term behavioral changes.^[5-7]

Recent theoretical approaches emphasize the role of families within the broad social context that shapes adolescent socialization and sexual development. Recent documents revealed that young people negotiate an autonomy that lets them incorporate values that are important to their family, albeit earlier evidence proposed that youths and adolescents make a discrete break from their families.^[5,8,9] Parents are primary sex educators of their teenagers and also function as resources for advice and information about sexual decision-making and partner selection. So far, various family-based program was carried out to prevent HIV infection in young people; however, their findings are contradictory and inconclusive.^[10-13] Therefore, we carried out the current systematic review to critically review the available literature regarding the role of family-based interventions among young people to prevent HIV infection. Our findings can be used by health practitioners to opt for the best approach for the prevention of HIV through family education.

Materials and Methods

Search strategy

Electronic online databases (i.e. PubMed, Scopus, and ISI Web of Sciences) were searched by two independent reviewers (ZE and FB) systematically up to November 2022 using the following keywords: (HIV OR AIDS OR HIV-1 OR HIV-2 OR "human immunodeficiency viruses" OR HTLV-III OR "human immunodeficiency virus" OR "acquired immune deficiency" OR "acquired immunodeficiency syndrome" OR "acquired immunodeficiency" OR "HIV infections" OR "T lymphotropic virus type III infections" OR "T-lymphotropic virus type III infection" OR "acquired immunologic deficiency") AND (youth OR youths OR youngster OR teenager OR teenagers OR teen OR teens OR adolescent OR adolescents OR adolescence OR child OR children OR "young person" OR "young people") AND (parents OR caregivers OR spouses OR mothers OR mother OR father OR fathers OR family OR families OR home) AND (prevent OR prevention OR preventive). The search strategy within each database is provided in Table 1. No filtering was made upon database searching in terms of study design, publication time, and language. The reference list of eligible studies was also screened for

any additional studies. Moreover, Google Scholar was also hand-searched to minimize the chance of missing any eligible study.

Study selection

Searched citations were exported to the EndNote X8 software (Thomson Corporation, Stamford, USA) and screened by two independent investigators (ZE and FB) against eligibility criteria. Studies were included if they were original peer-reviewed full-text articles that investigated the effects of family-based HIV prevention interventions in 14–24-year-old subjects using a randomized clinical trial or quasi-experimental design. They were excluded if they were non-original studies including review articles, commentary, letters, or poster abstracts; articles with non-English language; and studies that recruited >24 or <14 years old subjects. Any discrepancies regarding eligible studies were discussed with a third reviewer.

Data extraction

Data of interest were extracted through the full-text review by two independent investigators (ZE and FB) using a predefined word table. The extracted information was as follows: first author name; study location; published year; demographic characteristics of study population including age, sex, sample size; the protocol of HIV prevention strategy, study duration, and main outcomes of studies. Any disagreement between extracted data of the two reviewers was discussed further with the third reviewer.

Risk of bias assessment

The risk of bias in the eligible studies was examined by two independent authors (ZE and FB) using the Cochrane Collaboration Risk of Bias tool.^[14] It consists of eight components including allocation concealment, sequence generation, blinding, drop-outs and incomplete outcome data, outcome assessment, selective outcome reporting, and other potential sources of bias. Each component scored as low risk, high risk, and unclear to provide the risk of bias, and also the overall risk of bias of each study was stated as good, fair, or poor.

All methods were performed following the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) Statements,^[15] and the protocol was also registered in the PROSPERO database (CRD42022378545). Moreover, it was approved by the Isfahan University of Medical Sciences ethics committee with IR.MUI.RESEARCH.REC.1397.106 code.

Results

Search findings

Our initial systematic search through electronic databases

Table 1: Search strategy of selected databases

| PubMed |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Search hits: 15993 (((((((((((((((HIV[Title/Abstract]) OR (aids[Title/Abstract])) OR (HIV-1[Title/Abstract])) OR (HIV-2[Title/Abstract])) OR (“Human immunodeficiency viruses”[Title/Abstract])) OR (HTLV-III[Title/Abstract])) OR (“Human Immunodeficiency Virus”[Title/Abstract])) OR (“Acquired Immune Deficiency”[Title/Abstract])) OR (“acquired immunodeficiency syndrome”[Title/Abstract])) OR (“Acquired Immunodeficiency”[Title/Abstract])) OR (“HIV Infections”[Title/Abstract])) OR (“T Lymphotropic Virus Type III Infections”[Title/Abstract])) OR (“T-Lymphotropic Virus Type III Infection”[Title/Abstract])) OR (“acquired immunologic deficiency”[Title/Abstract])) AND (((((((((((((((youth[Title/Abstract]) OR (youths[Title/Abstract])) OR (youngster[Title/Abstract])) OR (teenager[Title/Abstract])) OR (teenagers[Title/Abstract])) OR (teen[Title/Abstract])) OR (teens[Title/Abstract])) OR (adolescent[Title/Abstract])) OR (adolescents[Title/Abstract])) OR (adolescence[Title/Abstract])) OR (child[Title/Abstract])) OR (children[Title/Abstract])) OR (“young person”[Title/Abstract])) OR (“young people”[Title/Abstract])) AND (((((((((((Parents[Title/Abstract]) OR (Caregivers[Title/Abstract])) OR (Spouses[Title/Abstract])) OR (Mothers[Title/Abstract])) OR (mother[Title/Abstract])) OR (father[Title/Abstract])) OR (fathers[Title/Abstract])) OR (Family[Title/Abstract])) OR (families[Title/Abstract])) OR (home[Title/Abstract])) AND (((prevent) OR (prevention)) OR (preventive))) |
| Scopus |
| Search hits: 10388 ((TITLE-ABS-KEY (HIV) OR TITLE-ABS-KEY (aids) OR TITLE-ABS-KEY (hiv-1) OR TITLE-ABS-KEY (hiv-2) OR TITLE-ABS-KEY (“Human immunodeficiency viruses”) OR TITLE-ABS-KEY (htlv-iii) OR TITLE-ABS-KEY (“Human Immunodeficiency Virus”) OR TITLE-ABS-KEY (“Acquired Immune Deficiency”) OR TITLE-ABS-KEY (“acquired immunodeficiency syndrome”) OR TITLE-ABS-KEY (“Acquired Immunodeficiency”) OR TITLE-ABS-KEY (“HIV Infections”) OR TITLE-ABS-KEY (“T Lymphotropic Virus Type III Infections”) OR TITLE-ABS-KEY (“T-Lymphotropic Virus Type III Infection”) OR TITLE-ABS-KEY (“acquired immunologic deficiency”))) AND ((TITLE-ABS-KEY (youth) OR TITLE-ABS-KEY (youths) OR TITLE-ABS-KEY (youngster) OR TITLE-ABS-KEY (teenager) OR TITLE-ABS-KEY (teenagers) OR TITLE-ABS-KEY (teen) OR TITLE-ABS-KEY (teens) OR TITLE-ABS-KEY (adolescent) OR TITLE-ABS-KEY (adolescents) OR TITLE-ABS-KEY (adolescence) OR TITLE-ABS-KEY (child) OR TITLE-ABS-KEY (children) OR TITLE-ABS-KEY (“young person”) OR TITLE-ABS-KEY (“young people”))) AND ((TITLE-ABS-KEY (parents) OR TITLE-ABS-KEY (caregivers) OR TITLE-ABS-KEY (spouses) OR TITLE-ABS-KEY (mothers) OR TITLE-ABS-KEY (mother) OR TITLE-ABS-KEY (father) OR TITLE-ABS-KEY (fathers) OR TITLE-ABS-KEY (family) OR TITLE-ABS-KEY (families) OR TITLE-ABS-KEY (home))) AND ((TITLE-ABS-KEY (prevent) OR TITLE-ABS-KEY (prevention) OR TITLE-ABS-KEY (preventive)))) |
| ISI Web of Science |
| Search hits: 23629 (HIV (Topic) or aids (Topic) or hiv-1 (Topic) or hiv-2 (Topic) or “Human immunodeficiency viruses” (Topic) or HTLV-III (Topic) or “Human Immunodeficiency Virus” (Topic) or “Acquired Immune Deficiency” (Topic) or “acquired immunodeficiency syndrome” (Topic) or “Acquired Immunodeficiency” (Topic) or “HIV Infections” (Topic) or “T Lymphotropic Virus Type III Infections” (Topic) or “T-Lymphotropic Virus Type III Infection” (Topic) or “acquired immunologic deficiency” (Topic)) AND (youth (Topic) or youths (Topic) or youngster (Topic) or teenager (Topic) or teenagers (Topic) or teen (Topic) or teens (Topic) or adolescent (Topic) or adolescents (Topic) or adolescence (Topic) or child (Topic) or children (Topic) or “young person” (Topic) or “young people” (Topic)) AND (Parents (Topic) or Caregivers (Topic) or Spouses (Topic) or Mothers (Topic) or mother (Topic) or father (Topic) or fathers (Topic) or Family (Topic) or families (Topic) or home (Topic)) AND (prevent (Topic) or prevention (Topic) or preventive (Topic))) |

yielded a total of 50010 articles. After removing duplicates, 41558 results remained and were screened by two independent reviewers on the basis of title/abstract and full text. Finally, seven articles were selected to be eligible for the current systematic review. The PRISMA flow diagram of the study selection process is shown in Figure 1.

General characteristics of the included studies

A total of seven studies including 4952 participants were enrolled in the current study. They were conducted between 2006 and 2020 with a sample size ranging from 111 to 2564. Study duration ranged from 72 to 12 weeks. Four studies were carried out in the USA,^[16-19] Nigeria,^[20] Thailand,^[21] and the Bahamas.^[22] Four studies were randomized clinical trials (RCT),^[16,17,19,22] and three were quasi-experimental in design.^[18,20,21] Five studies implemented an intervention in the control group; however, two studies provided nothing for those in the control group.^[20,21] Study characteristics are presented in Table 2.

Two studies ranked as fair^[16,19] and five as poor quality.^[17,18,20-22] All studies were at low risk of bias

regarding incomplete outcome data, selective reporting, and other sources of bias. Except for the work of Fongkaew *et al.*^[21], others were at low risk of bias in terms of random sequence generation. However, the most issue regarding the risk of bias was selected as allocation concealment and blinding. The results of the risk of bias assessment are shown in Table 3.

Findings from the systematic review

The first investigation was done in 2009 to evaluate the effects of HIV/AIDS-related education on the attitudes and prevention-related skills of students in Nigeria.^[20] Students received education regarding HIV/AIDS-related attitudes and prevention-related skills, and a post-intervention assessment was done at 12 weeks. Study results revealed a significant effect of the intervention on preventive measures for HIV/AIDS.

The next survey was conducted among 199 Black/African American female students (14–18 years) to reduce sexually transmitted infections including HIV.^[18] After 12 months of intervention, participants of the

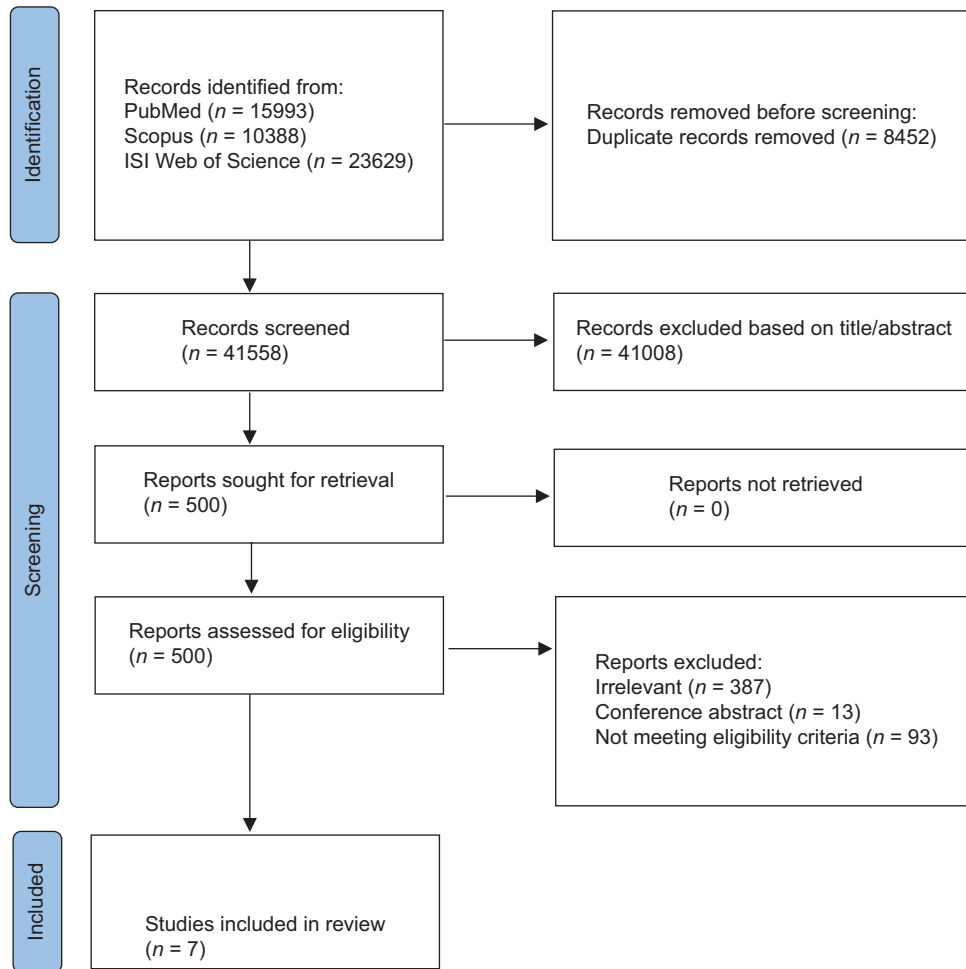


Figure 1: Flow diagram of the study selection process

intervention group were 43% less likely to contract HIV or other sexually transmitted infections.

Fongkaew *et al.*^[21] examined the role of reproductive health programs and HIV in the prevention of HIV/AIDS prevention using a family-based approach among 111 youth aged 16–20. The findings of the study revealed that youth–adult partnership with schools improved leadership role preparation and empowered youth leaders to undertake activities on their own, initiate creativity and share knowledge on sexuality education and HIV prevention messages with students in schools.

Another document provided the findings of the HIV prevention RCT among 227 Latino youth (14–17 years). They were taught about HIV/AIDS prevention knowledge and also communication about sex and other risk behaviors. Although the Latino STYLE was not completely efficacious during three months of intervention, it improved the sexual risk behavior of youth.^[19]

Villarruel *et al.*^[16] evaluated the role of a family-based intervention to increase sexual risk communication in

Mexican families (n = 791; 14–24 years). After 12 months of follow-up, families in the HIV risk reduction reported more comfort with communication, more sexual risk communication, and more general communication than participants of the control group.

The other evidence by Wang *et al.*^[22] reported the effect of family involvement in youth HIV/AIDS risk reduction intervention among 2564 Bahamas students aged 13–17 years. This evidence proposed that youth condom use skills and self-efficacy improved following the intervention. Moreover, perceived parental monitoring and communication regarding sex-related issues were improved.

The last study was conducted among youth (13–18 years) as a multisite RCT to prevent HIV by Brown *et al.* in 2014. Compared to general health intervention, those with HIV/AIDS-related attitudes and prevention-related skills reported a greater likelihood of avoiding sex, greater condom use, fewer unsafe sex acts, and also improved self-efficacy and HIV knowledge. Moreover, the intervention significantly improved parent–youth sexual communication.^[17]

Table 2: Characteristics of the included studies

| First author (Publication year) | Country | Total sample size (M/F) | Target population | Age range (year) | Study design | Duration | Intervention of experimental group | Intervention of control group | Main findings | ROB |
|-------------------------------------------|---------------|-------------------------|------------------------|------------------|--------------------|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|
| Akpabio et al., ^[60] (2009) | Nigeria | 169/170 | Students | 9-20 | Quasi-experimental | 12 | HIV/AIDS-related attitudes and prevention-related skills | - | Results show significant effect of intervention on students' attitudes toward preventive measures | Poor |
| Donenberg et al., ^[68] (2020) | United States | 199 F | Black/African-American | 14-18 | Quasi-experimental | 12 | Strengthening mother-daughter relationships and communication, particularly regarding HIV prevention and safer sexual behavior, increasing self-efficacy to use condoms, improving maternal monitoring, promoting pride in Black/African-American culture and encouraging gender empowerment. | Health promotion control | Daughters in the intervention group were 43% less likely to contract a new STI in the 12-month post-intervention period compared with those in the health promotion control program | Fair |
| Fongkaew et al., ^[61] (2006) | Thailand | 47/64 | Students | 16-20 | Quasi-experimental | 24 | Knowledge and attitude toward child rights, duty, responsibility, and HIV/sexual and reproductive health | - | The model was effective in leadership role preparation and in empowering youth leaders to undertake activities on their own, initiate creativity, and share knowledge on sexuality education and HIV prevention messages | Poor |
| Lescano et al., ^[19] (2020) | United States | 109/118 | Latino youth | 14-17 | Parallel RCT | 72 | Knowledge of HIV prevention, how to identify high-risk behaviors, assertive communication about sex and risk behaviors, teens' decision-making processes and effects on engaging in risky behaviors, and parent-child communication and relationships in Latino families | Exercise, nutrition, sleep, smoking, and basic information about HIV, including condom use | A decrease in adolescent sexual risk behavior | Fair |
| Villarruel et al., ^[16] (2008) | United States | 131/660 | Students | 14-24 | RCT | 48 | Pregnancy and HIV prevention, and sexual-specific communication | Provide participants with information regarding health problems related to behaviors other than sexual behaviors such as heart disease, certain cancers, and diabetes | Intervention group reported significantly more general communication, more sexual risk communication and more comfort with communication | Fair |

Contd...

Table 2: Contd...

| First author (Publication year) | Country | Total sample size (M/F) | Target population | Age range (year) | Study design | Duration | Intervention of experimental group | Intervention of control group | Main findings | ROB |
|-------------------------------------|---------------|-------------------------|-------------------|------------------|--------------|----------|---------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|
| Wang et al. ^[22] (2014) | Bahamas | 1117/1447 | Students | 13-17 | RCT | 72 | The parent-adolescent sexual risk communication intervention, or the goal-setting intervention on the basis of social cognitive model | A factual presentation of HIV and pregnancy prevention and discussions about marriage and parenting | Intervention is effective in improving parent-adolescent communication on sex-related issues and perceived parental monitoring as well as the youth's condom use skills and self-efficacy | Poor |
| Brown et al. ^[17] (2014) | United States | 311/410 | Students | 13-18 | RCT | 12 | HIV/AIDS-related attitudes and prevention-related skills | General health intervention | Participants of the intervention group reported fewer unsafe sex acts, greater condom use, and greater likelihood of avoiding sex. They also showed improved HIV knowledge and self-efficacy. The family-based intervention, compared with the other interventions, produced significant improvements in parent-teen sexual communication, parental monitoring, and parental permissiveness | Poor |

M: Male, F: Female, RCT: Randomized controlled trial, ROB: Risk of bias, Sexually transmitted infection: STI, HIV: Human immunodeficiency virus, AIDS: Acquired immunodeficiency syndrome

Discussion

The epidemic of HIV/AIDS continues to be one of the most urgent issues of public health, as the number of people living with this infection is at the highest rate since 1981 when it was reported for the first time. Therefore, a focus on preventing it among young people is still a public health priority. The current systematic review was done to answer this issue by reviewing and summarizing available literature regarding family-based HIV/AIDS preventive interventions among the youth population.

Based on the available literature, family-based HIV prevention interventions seem to be effective in terms of improving HIV/AIDS knowledge and also parent-youth communication. Moreover, some points need to be addressed. The enrolled studies were heterogeneous in terms of educational approach, implemented models, duration of intervention, sample size, and ethnicity. This issue impacts the internal validity of our study and diminishes the generalizability of the findings. Moreover, four out of seven studies ranked as poor quality with no high-quality study. These issues highlighted the need for further high-quality studies on this topic.

Young people do their best when their relationship with their father and mother is positive and communication is open.^[23] These parenting practices are often difficult to keep on as their children become older because the child-parent relationship becomes less cohesive, less warm, and more conflictual.^[24] Parents need support, especially during this transitional period when young people sexually maturing and may involve in unsafe behaviors which predispose them to a higher risk of HIV infection. Most of the family-based interventions among young people focus on the communication of parents with their children regarding substance use and sexual topic through the teaching of parents.^[25-34] Although this approach was successful in increasing intentions to communicate about sex and the knowledge of safe sex, it was not successful to improve the behavioral outcomes of young people (e.g., increasing condom use). The lack of involvement of families' children may be the reason for this issue^[35]; more accurately, these are parent-based interventions. Later interventions bring young people and parents together in at least one session to improve behavioral outcomes.^[36-39] Despite a family-based approach being suggested, parents need some time to be taught alone regarding reproductive health and developmental growth, in addition, to clarifying their values and recognizing their attitudes.^[40] Caregivers' attitudes regarding young people's sexual activity affect their adolescents' behavior and should be acknowledged in any parent-based or family-based education.^[41] Young people are less likely to involve in

Table 3: Risk of bias assessment for included studies

| First author (publication year) | Random sequence generation | Allocation concealment | Blinding of participants and personnel | Blinding of outcome assessment | Incomplete outcome data | Selective reporting | Other sources of bias | Overall quality |
|------------------------------------|----------------------------------|---------------------------|----------------------------------------------|--------------------------------------|-------------------------------|------------------------|-----------------------------|--------------------|
| Akpabio <i>et al.</i> , (2009) | L | H | H | U | L | L | L | Poor |
| Donenberg <i>et al.</i> , (2020) | L | H | H | L | L | L | L | Poor |
| Fongkaew <i>et al.</i> , (2006) | U | H | H | U | L | L | L | Poor |
| Lescano <i>et al.</i> , (2020) | L | U | U | L | L | L | L | Fair |
| Villarruel <i>et al.</i> , (2008) | L | U | U | L | L | L | L | Fair |
| Wang <i>et al.</i> , (2014) | L | H | H | U | L | L | L | Poor |
| Brown <i>et al.</i> , (2014) | L | H | H | H | L | L | L | Poor |

high-risk sexual activity when their parents are clear about their expectations and attitudes and discuss them with their adolescents.^[42] Moreover, it was summarized by Johnson *et al.* that family-based interventions should build effective adolescent behavior change strategies, incorporate theory, and encourage earlier preventive activities to support young people's protective behaviors before sexual debut that subsequently led to efficacy and behavioral skills.^[43,44]

It was reported by Pedlow *et al.* that only 57% of interventions were effective in reducing high-risk sexual behaviors.^[45] Most of the reviewed interventions implemented social cognitive theory and partially may explain limited success; therefore, we need to expand our current models to improve the efficacy of interventions.^[46] Other individual-level theories that were implemented in the context of HIV prevention interventions include the Information, Motivation, Behavioral Skills Model,^[47] the Trans-theoretical Model,^[48,49] Planned Behavior,^[50] and the Theories of Reasoned Action.^[51] These models were reported to be effective in changing behavior in different groups with diverse risk levels, although they primarily focus on the individual level.^[52,53] Moreover, recent reviews of these models suggested that because these theoretical models do not explicitly consider high-level connections, their success in the context of HIV prevention is limited.^[54]

Although the current systematic review was among the first investigations which summarized the available evidence regarding the efficacy of family-based interventions in HIV/AIDS prevention, some limitations need to be addressed. The most substantial limitation was the heterogeneity of enrolled studies. They were heterogeneous in terms of the target population (i.e., age, sex, geographical location, and socioeconomic status), methodology (i.e., sample size, study design, study duration, and quality), and different interventional approaches. This heterogeneity precludes us to conduct a meta-analysis and also diminishes the internal validity of our work. Moreover, there is a lack of well-designed studies with an adequate length of follow up which highlighted the need for further investigations.

Conclusion

According to what was discussed, it seems that family-based interventions in youth to prevent HIV/AIDS are effective; however, further well-designed studies are needed to help the researchers reach a firm conclusion on this issue. The current systematic review may be used by investigators for future studies in terms of settings and the selection of educational approaches. Moreover, it strongly suggested that further studies investigating the role of family-based education in the prevention of HIV/AIDS utilize more sample size and also a more robust educational framework.

Ethics approval and consent to participate

All methods were performed following the relevant guidelines and regulations of the Helsinki Declaration and approved by the Isfahan University of Medical Sciences ethics committee with IR.MUI.RESEARCH.REC.1397.106 code.

Availability of data and materials

The data supporting this study's findings are available from the corresponding author upon reasonable request.

Authors' contribution

AAE: Conceptualization, Methodology, Writing - Review and Editing, Supervision

ZE and FB: Conceptualization, Methodology, Formal analysis, Writing - Original Draft, Writing - Review and Editing

MR: Writing, Critical Revision, and Editing for content and English language

ZFD: Methodology, Writing - Review and Editing

All authors reviewed the manuscript.

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Conflicts of interest

There are no conflicts of interest.

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