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

Ahmad Ali Eslami, Zahra Ebrahimi<sup>1</sup>, Majid Rahimi, Zohre Fathian-Dastjerdi, Fahimeh Bagherikholenjani<sup>2</sup>

#### 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

A dolescents and young people are the fastest-growing populations at risk for human immunodeficiency virus (HIV)/ acquired immunodeficiency syndrome (AIDS) in developing and developed countries.<sup>[1]</sup> 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.<sup>[1,2]</sup> It is currently the leading cause of death among 15–24-year-old individuals.<sup>[2]</sup> Most young

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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 12<sup>th</sup> grade.<sup>[3]</sup> Moreover, 33.5% of males and 17.6% of females report using drugs or alcohol before the last sexual intercourse.<sup>[3,4]</sup>

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.<sup>[5,6]</sup> 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.<sup>[5-7]</sup>

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.<sup>[5,8,9]</sup> 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

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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.<sup>[14]</sup> 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,<sup>[15]</sup> 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

PubMed

#### Table 1: Search strategy of selected databases

#### Search hits: 15993

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 (httv-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 (spouses) OR TITLE-ABS-KEY (mothers) OR 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 (spouses) OR TITLE-ABS-KEY (family) OR TITLE-ABS-KEY (mother) OR TITLE-ABS-KEY (home))) AND ((TITLE-ABS-KEY (prevent) OR TITLE-ABS-KEY (family) 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 "T-Lymphotropic Virus Type III Infections" (Topic) or "T-Lymphotropic Virus Type III Infections" (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 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,<sup>[16-19]</sup> Nigeria,<sup>[20]</sup> Thailand,<sup>[21]</sup> and the Bahamas.<sup>[22]</sup> Four studies were randomized clinical trials (RCT),<sup>[16,17,19,22]</sup> and three were quasi-experimental in design.<sup>[18,20,21]</sup> Five studies implemented an intervention in the control group; however, two studies provided nothing for those in the control group.<sup>[20,21]</sup> Study characteristics are presented in Table 2.

Two studies ranked as fair<sup>[16,19]</sup> and five as poor quality.<sup>[17,18,20-22]</sup> 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.*<sup>[21]</sup>, 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.<sup>[20]</sup> 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.<sup>[18]</sup> After 12 months of intervention, participants of the



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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.*<sup>[21]</sup> 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.<sup>[19]</sup>

Villarruel *et al.*<sup>[16]</sup> 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.*<sup>[22]</sup> 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.<sup>[17]</sup>

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Country ample Size (MIX)   Cali ample Size (MIX)   Cali Size (MIX) Submiss   Cali Submiss <th>ha</th> <th>racterist</th> <th>tics of th</th> <th>e included studi</th> <th>es</th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th>	ha	racterist	tics of th	e included studi	es						
169:170   Students   2-20   Quasi- transversion   12   HV/AIDS-related attluctes and untervention on statutes experimental   Pesults structures activation statutes activation statutes   Results structure activation statutes     198 F   Black   1-18   Quasi- experimental   12   Rivation-statuted statis   Intervention on statutes activation statutes   Intervention on statutes     198 F   Black   Intervention- experimental   12   Streaghtening mother- activation statutes   Health promotion control   Daughter intervention activation statutes     47/64   Students   16-30   Quasi- statutes   24   Knowledge and attlucte control statutes   Promotion control promotion control pro- compared with hose and encoursigning grade in monitoring, promoting provening activation and encoursigning grade in and encoursigning grade in and encoursigning grade in and encoursigning grade in and encoursigning and and encoursigning and and and encoursigning and and and encoursig	ountry		Total sample size (M/F)	Target population	Age range (vear)	Study I design	Duration	Intervention of experimental group	Intervention of control group	Main findings	ROB
199F   Batcu/ Incar-American   14-18   Quasi- communication, particulary communication, particulary communication, particulary communication, particulary communication, particulary commonitoring, particulary compares virtual and safets sexual behavior, improving pride in Back/Antennatican culture condons, improving pride in Back/Antennatican culture and encouraging gende and encouraging and encouraging gende and encouraging and encouraging gende and encouraging and encouraging gende and encouraging gende and encouraging gende and encouraging gende and encouraging gende and encouraging and encouraging gende and encouraging and encouraging and and encouraging and and and and and an	ligeria		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
I 47/64 Students 16-20 Quasi- experimental experimental and reproductive health and reproductive health behaviors, assertive behaviors, assertive decision-mation and relationship processes and fieldes and affects on engaging in risky behaviors, assertive decision-mation and relationship in Latino and relatino and re	tates		199 F	Black/ African-American	14-18	Quasi- experimental	0	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
109/118 Latino youth 14-17 Parallel RCT 72 Knowledge of HIV prevention, Exercise, nutrition, sleep, smoking, and behavior assertive basic information about communication about sex HIV, including condom and risk behaviors, and decision-making processes and effects on engaging in risky behaviors, and parent-child communication and risky behaviors, and freeds on engaging in risky behaviors, and freeds on engaging in risky behaviors, and the freeds on engaging in risky behaviors, and the freeds on engaging in risky behaviors, and the freeds on engaging in risky behaviors, and risky behaviores and risky behaviores and risky behaviores and risky behaviors,	hailanc	-	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
131/660 Students 14-24 RCT 48 Pregnancy and HIV Provide participants Intervention group re prevention, and sexual-specific with information significantly more gen communication regarding health communication, more problems related to communication and r problems related to communication and r sexual behaviors such as heart disease, certain cancers, and diabetes	tates		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
	tates		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

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Contd...

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	onta									
First author	Country	Total	Target	Age	Study	Duration	Intervention of experimental	Intervention of control	Main findings	ROB
(Publication year)		sample size (M/F)	population	range (year)	design		group	group		
Wang	Bahamas	1117/1447	. Students	13-17	RCT	72	The parent-adolescent	A factual presentation	Intervention is effective in	Poor
<i>et al.</i> , <sup>[22]</sup>							sexual risk communication	of HIV and pregnancy	improving parent-adolescent	
(2014)							intervention, or the goal-setting	prevention and	communication on sex-related	
							intervention on the basis of	discussions about	issues and perceived parental	
							social cognitive model	marriage and parenting	monitoring as well as the youth's	
									condom use skills and self-efficacy	
Brown	United	311/410	Students	13-18	RCT	12	HIV/AIDS-related attitudes and	General health	Participants of the intervention	Poor
et al., <sup>[17]</sup>	States						prevention-related skills	intervention	group reported fewer unsafe sex	
(2014)									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	
M: Male, F: Fe	male, RCT: Re	indomized cc	ontrolled trial, RO	B: Risk of bias	, Sexually trans	smitted infection	on: STI, HIV: Human immunodeficiend	cv virus, AIDS: Acquired immu	unodeficiency syndrome	

ROB: Risk of bias, Sexually transmitted infection: STI, HU': Human immunodeficiency virus, AIDS: Acquired immunodeficiency syndrome

F: Female, RCT: Randomized controlled trial,

#### 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 parentyouth 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.<sup>[23]</sup> 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.<sup>[24]</sup> 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<sup>[35]</sup>; 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.<sup>[40]</sup> 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

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nYQp/IIQrHD3i3D0OdRyi7TvSFI4Cf3VC1y0abggQZXdtwnfKZBYtws= on 11/12/2024

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 et al., (2009)	L	Н	Н	U	L	L	L	Poor
Donenberg et al., (2020)	L	н	Н	L	L	L	L	Poor
Fongkaew et al., (2006)	U	н	Н	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	н	Н	U	L	L	L	Poor
Brown <i>et al</i> ., (2014)	L	Н	Н	Н	L	L	L	Poor

#### Table 3: Risk of bias assessment for included studies

high-risk sexual activity when their parents are clear about their expectations and attitudes and discuss them with their adolescents.<sup>[42]</sup> 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.<sup>[43,44]</sup>

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.<sup>[46]</sup> Other individual-level theories that were implemented in the context of HIV prevention interventions include the Information, Motivation, Behavioral Skills Model,<sup>[47]</sup> the Trans-theoretical Model, [48,49] Planned Behavior, [50] and the Theories of Reasoned Action.<sup>[51]</sup> 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.<sup>[54]</sup>

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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