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Original article

Risk and Protective Factors for the Sexual and Reproductive Health of Young Adolescents: Lessons Learnt in the Past Decade and Research Priorities Moving Forward



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 A B S T R A C T

Purpose: To review the published literature on what has been reported on risk and protective factors for early adolescent sexual and reproductive health (SRH) in the recent decade.

Methods: A scoping review of English language, peer-reviewed literature on risk and protective factors for early adolescent (aged 10–14 years) SRH published between January 2010 and January 2023 using Medline, Web of Science, PsycInfo, CINAHL, and Google Scholar. Articles reporting only on non-modifiable demographic factors, or on the effect of interventions, were beyond the scope of this review.

Results: Of 11,956 screened records, 118 were included of which half (49.2%) were published since 2018. Most articles (44.9%) presented research conducted in North America, followed by sub-Saharan Africa (20.3%) and East Asia and Pacific (16.1%). Five percent were based on multicountry studies or reported on pooled global data. Two-thirds (61.0%) reported on quantitative cross-sectional research designs, and 78.8% included both females and males. The most common SRH outcomes were sexual behaviors (34.7%); sexual and dating violence (28.8%); and sexual attitudes, beliefs, and intentions (19.5%). Most (83.0%) articles reported on risk/protective factors at the individual level, followed by interpersonal (family 58.5%, peers 33.0%, partners 11.9%), school (21.2%), and community (15.2%) factors. None of the included articles reported on macro/structural-level factors.

Discussion: While there has been growing attention to risk/protective factors for early adolescent SRH, gaps remain with regards to study contexts (mainly North America), focus (mostly individual factors), and conceptualizations (generally risk-oriented). We offer recommendations for research priorities over the coming decade.

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IMPLICATIONS AND CONTRIBUTION

Interventions to improve young adolescents' sexual and reproductive health need to be informed by an understanding of the contexts where young people, especially the most vulnerable, live. Additionally, research should address macro-level determinants of sexual and reproductive health (e.g., climate, migration, and displacement).

Conflicts of interest: The authors have no conflicts of interest to declare.

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Early adolescence, the ages between 10 and 14 years, is marked by several simultaneous developmental processes, including physical, mental, and social changes as young people transition from childhood toward adulthood [1]. Sexual and reproductive maturation is one of the cornerstone changes in this age group [2]. It is also a period where the acquisition of sexual and reproductive knowledge and skills begins, closely interconnected with the formation of intimate social and sexual relationships [3]. Relatedly, young adolescents experience extensive socialization, especially regarding gender and sexuality, that forms the foundation of lifelong behaviors and their related outcomes [4].

In 2010, the UNDP/UNFPA/UNICEF/WHO/World Bank Special Program of Research, Development, and Research Training in Human Reproduction (HRP) held a technical consultation with an expert panel to review the evidence on the sexual and reproductive health (SRH) of young adolescents, with focus on low-income and middle-income countries (LMICs) [5]. As the HRP consultation pointed out, young adolescents are often excluded from research for a variety of reasons—their perceived vulnerability, challenges of consent in this age group, and anticipated parental and social pushback. The expert panel emphasized the need to better understand the factors that exacerbate SRH risk and reduce vulnerability in this age group even before they become sexually active [5].

Informed by priorities of that 2010 consultation, the present paper takes stock of the literature published since then (i.e., during the second decade of the 21st century) on risk and protective factors for SRH among young adolescents aged 10–14 years. Specifically, the review aims to understand (1) what risk/protective factors have been reported in research on young adolescents and in relation to SRH outcomes and (2) how these risk/protective factors have been conceptualized and measured. Drawing on these questions, we provide a set of recommendations for research to further advance our understanding of risk/protective factors for SRH among young adolescents.

Conceptual framework

This review is informed by the conceptual framework first articulated in the Social Development Project by Hawkins et al. (2007) [6]. It builds on Bronfenbrenner's social-ecological systems theory [7], illustrating how risk and protective factors at different levels (individual, interpersonal [family, peer, partners], school, community, and broader society) interact to shape adolescent health and wellbeing. In this review, we define risk factors as elements or conditions that increase the likelihood of negative health outcomes or behaviors, while protective factors are those that reduce the likelihood of negative health outcomes and/or promote positive outcomes or behaviors. While one thinks of a given factor as either risk or protection, the context in which a young person lives can determine whether a given factor is protective, risky, or both [8]. Given that the same factor can both promote or impede health depending on the context, we refer to “risk/protective” factors throughout the paper and focus less on determining their specific direction of influence.

Methods

We conducted a scoping review of available peer-reviewed, English language literature on risk and protective factors associated with SRH outcomes among young adolescents. As Mak

and Thomas [9] note, such a review is useful to map literature on a specific topic and to identify gaps. In contrast to systematic reviews, which investigate the evidence for a given topic based on the quality of the included articles, scoping reviews help to provide a (quicker) snapshot of what has been reported irrespective of the strength of the evidence, and may serve as a foundation for subsequent systematic reviews [10].

Here, we consider qualitative, quantitative, and mixed-methods articles. We follow the steps suggested by Mak and Thomas [9] including clarifying the questions under study, identifying relevant publications, deciding what should be included in the review, selecting the publications, extracting and charting the data, and summarizing the most salient findings. The review is structured according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for scoping reviews checklist.

Information sources and search strategy

We searched the English language, peer-reviewed literature published between January 2010 and January 2023, in five databases: Medline, Web of Science Core Collection, PsycInfo, CINAHL, and Google Scholar. The search strategy was developed in collaboration with librarians at Karolinska Institutet, using free text and controlled vocabulary (e.g., medical subject headings terms). The strategies were peer-reviewed before execution. Duplication was eliminated and digital object identifiers were compared. Full search strategies for all databases are available in [Appendix A](#). The search focused on the risk and protective factors relevant for SRH outcomes. Grey literature reports were beyond the scope of the present review.

Study selection

Initially, titles and abstracts were independently screened by two reviewers using the electronic software *Rayyan* [11]. Article selection was based on reviewer agreement. In cases of disagreement, a third member of the research team resolved the disagreement. Articles that passed the title and abstract screening were promoted to full-text review.

Inclusion criteria

Articles were included for full-text review if they met the following criteria.

1. Published in a peer-reviewed journal between January 2010 and January 2023.
2. Written in English.
3. Presented original research.
4. The study population included adolescents between ages 10 and 14 years, or a broader age group as long as one of the following conditions was met: (i) findings present age disaggregated data for young adolescents, (ii) the mean age of the full sample was between 10 and 14 years, or (iii) at least 80% of participants were aged 10–14 years.
5. Reported one or more SRH-related outcomes in line with the 2018 Gutmacher-Lancet [12] definition of SRH and rights. Given the age and developmental stage of 10–14-year-olds, we applied a deliberately broad definition of SRH outcomes to include knowledge, attitudes, and behaviors as part of early adolescent sexuality development, in addition to “traditional”

public health outcomes such as pregnancy and human immunodeficiency virus (HIV) [13].

- Reported SRH-related modifiable risk/protective factors (i.e., those that are amenable to change, such as knowledge, attitudes and behavior, schooling, parental support, or poverty) at one or more levels of the social-ecological framework.

Exclusion criteria

We excluded articles that reported on intervention studies or program evaluations given our focus on social-ecological risk/protective factors rather than the effect or impact of interventions to address such factors. However, intervention or program studies that presented observational details on risk/protective factors were still considered. We further excluded articles that focused only on nonmodifiable factors such as age or genetics. Articles that reported demographic factors such as age and sex were included when descriptive of the study population if the study focused on other modifiable factors.

Data charting

Following full-text review, key characteristics of included articles were recorded in a structured Microsoft Excel template (Appendix B). We extracted the following information: author names, publication year, country/countries of study, aim/objective, design, setting, population, sample and sample size, SRH outcomes, independent variables (i.e., risk and/or protective factors), socio-ecological levels(s) of risk/protective factors, data collection methods, measures, analysis, key findings, and study limitations. The data were synthesized using a narrative, thematic approach, whereby extracted SRH outcomes were first grouped into themes. Next, each risk/protective factor extracted was reviewed and categorized into themes according to the social-ecological levels (individual, interpersonal, school, community, macro/societal). For example, if two articles reported on the influence of perceived peer behaviors and attitudes, these

were grouped into “peer norms”. We then mapped the risk/protective factors in relation to geography and types of SRH outcomes explored so as to visualize which factors received the most attention and to identify the gaps in the literature.

Results

Below, we summarize findings from the synthesis, beginning with a description of the included articles. We then provide an overview of the SRH-related outcomes explored, followed by the risk and protective factors examined in relation to these outcomes, organized by the social-ecological framework.

Characteristics of the included articles

Figure 1 presents the Preferred Reporting Items for Systematic Reviews and Meta-Analyses flow diagram for the process of screening, inclusion, and exclusion. A total of 11,956 records were initially identified. Subsequently, 6,934 duplicates were excluded, and 5,022 unique records retained. After abstract review, an additional 4,849 records were excluded because they did not meet the inclusion criteria. Full texts of the remaining 173 articles were assessed, and 55 additional articles were excluded because they did not report on risk and protective factors and/or SRH-related outcomes. The remaining 118 articles—105 quantitative and 13 qualitative—were included for data extraction.

Geographical distribution and study setting. Nearly half (44.9%) of the articles presented research conducted in North America, all of which were conducted in the United States. Additionally, 20.3% reported on research conducted in sub-Saharan Africa, 16.1% from East Asia and Pacific, 8.5% from Europe and Central Asia, and 5.1% from Latin America and Caribbean. Five percent reported on research conducted in multiple regions or used pooled data from multiple countries (Table 1). Notably, none of the identified articles reported on research conducted in the Middle East and North Africa (MENA) or South Asia regions. Altogether, 31 countries were

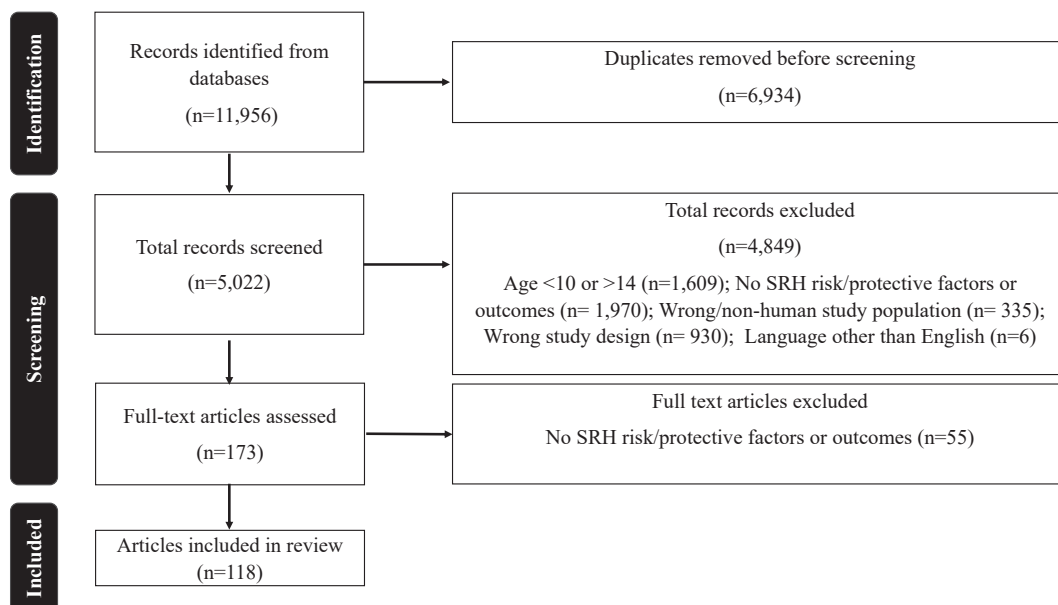


Figure 1. PRISMA flow diagram.

Table 1
Characteristics of the included articles, published 2010–2022

Characteristics	n	%
Publication year		
2010–2013	33	28.0
2014–2017	27	22.9
2018–2022	58	49.2
Regions ^a		
East Asia and Pacific	19	16.1
Europe and Central Asia	10	8.5
Latin America and Caribbean	6	5.1
North America	53	44.9
Sub-Saharan Africa	24	20.3
Multiple regions ^b	3	2.5
Global (consolidated data)	3	2.5
Country income level ^c		
High income	81	68.6
Upper middle income	16	13.6
Lower middle income	9	7.6
Low income	15	12.7
Multicountry study ^d	7	5.9
Study design		
Quantitative cross-sectional	72	61.0
Quantitative cohort/longitudinal	33	28.0
Qualitative	13	11.0
Participant sex		
Male	6	5.1
Female	19	16.1
Mixed	93	78.8
Study setting		
Rural	12	10.2
Urban	43	36.4
Mixed	63	53.4
Urban poor/slum	6	5.1
Humanitarian context	1	0.8
Data source		
Primary data	72	61.0
Secondary data	46	39.0
Study Location		
School	75	63.6
Health facility	8	6.8
Community/household	34	28.8
Internet	1	0.8
Data collection method		
Interviewer administered paper survey	42	35.6
Self-administered paper survey	18	15.3
CAPI/CASI/ACASI	39	33.1
Qualitative methods	14	11.9
Simulated internet chat room	1	0.8
Clinical records	4	3.4
Risk/protective factor measure		
Existing validated scales/measure	81	68.6
Existing unvalidated scale/measure	12	10.2
Developed new scale/measure	10	8.5
Qualitative interview guide	13	11.0
Not specified	2	1.7

CAPI = Computer-assisted personal interviewing; CASI = Computer-assisted self-interviewing; ACASI = Audio-computer-assisted self-interviewing.

^a Regions according to World Bank classifications (<https://datatopics.worldbank.org/sdcatlas/archive/2017/the-world-by-region.html>).

^b Multiple regions refer to articles reporting on studies that presented disaggregated data for countries across more than one region. These included East Asia and Pacific, sub-Saharan Africa, Latin America and Caribbean (n = 1); Europe and Central Asia, East Asia and Pacific, sub-Saharan Africa, Latin America and Caribbean (n = 1); Latin America and Caribbean and North America (n = 1). Global consolidated data refer to articles which only presented aggregated analyses of large-scale, multicountry data from the Global School-based Student Health Surveys (GSHS).

^c According to World Bank country classifications by income levels, 2023–2024.

^d Multicountry refers to articles reporting on studies conducted in more than one country of different income level classifications. One article focused on three countries within the sub-Saharan African region, and the remaining on countries from multiple regions and global consolidated analysis of GSHS data.

represented in the included research (Figure 2). In addition, three articles (2.5%) presented consolidated findings from the Global School-based Student Health Survey [14–16] (these were not included in the above regions because the data were not disaggregated by country). A majority (68.6%) of articles were based on research from high-income countries, followed by upper middle income (13.6%), low income (12.7%), and lower-middle income countries (7.6%); seven articles (5.9%) reported on multicountry studies spanning multiple income levels.

As shown in Figure 3, the proportion of articles reporting on research conducted in North America decreased over time (from 63.6% of articles in 2010–2013 to 31.0% in 2018–2022), while the share of articles focused on sub-Saharan Africa increased from 0% to 34.5%, respectively. Similarly, the proportion of articles that presented research from high-income countries declined by half over time (from 97.0% of articles in 2010–2013 to 48.3% in 2018–2022) parallel to an increased focus on low-income countries (from 0% to 22.4% of articles during the same time periods) and other income levels (data not shown).

About half (53.4%) of the articles reported on studies conducted in both rural and urban settings. A third of the articles (36.4%) were based on studies conducted only in urban settings, six of which used data from the Global Early Adolescent Survey, which focused on young adolescents residing in urban poor communities in 11 countries worldwide. One article reported on young adolescents living in refugee camps in Ethiopia [17]. Two-thirds (63.6%) of the articles were based on studies conducted in school settings with the rest being conducted in health facilities, communities or households, and online.

Study design. Half of the included articles (49.2%) were published since 2018. About two-thirds (61.0%) across the publication years reported on studies using quantitative cross-sectional study designs. About a quarter (28.0%) reported on quantitative longitudinal or cohort studies, and one in 10 (11.0%) on qualitative studies of which half were published after 2018 (not shown in table). Two-thirds of articles (61.0%) were based on primary data. The remaining were based on secondary data from studies such as the Global Early Adolescent Survey (n = 6) [18–23], the UK Millennium Cohort Study (n = 1) [24], the Three-City Asian Study of Adolescents and Youth (n = 1) [25], and the Promoting Sexual and Reproductive Health Among Adolescents in Southern and Eastern Africa study (n = 2) [26,27].

Measurement. About a third of the articles (35.6%) reported on studies using interview-administered paper surveys while a similar proportion (33.1%) used either computer-assisted personal interviews or computer-assisted self-interviews. One article reported on a study that used an in vivo experimental procedure involving the use of a simulated internet chat room to measure peer influence susceptibility [28].

Two-thirds of articles (68.6%) reported on studies that used existing validated measures of risk/protective factors. About one in 10 publications (10.2%) reported data from unvalidated scales or other measures. Two articles did not specify the measures used.

Sexual and reproductive health–related outcomes in studies with young adolescents

Table 2 presents the SRH-related outcomes explored in the included articles, grouped into 10 themes and ordered according

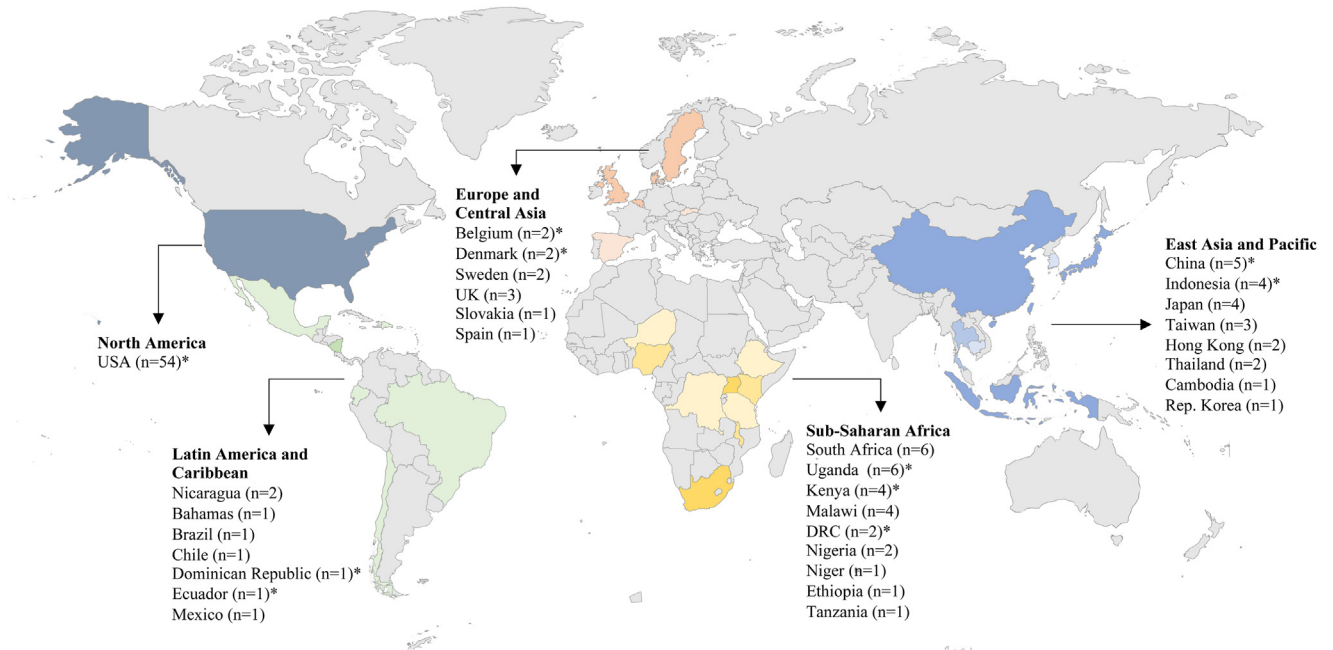


Figure 2. Geographical distribution of study countries in the included articles, by region. The figure displays the number of articles (n) across study countries, organized by color-coded geographical regions with darker shades representing higher number of articles. Countries that were included in one or more multicountry articles are marked with an asterisk (*). DRC = Democratic Republic of Congo; Rep. Korea = Republic of Korea (South Korea); UK = United Kingdom. Articles reporting on global consolidated analyses of data from > 10 countries are excluded from the figure (n = 3).

to the number of articles exploring each theme: (1) Sexual behaviors; (2) Sexual and dating violence; (3) Sexual attitudes, beliefs, and intentions; (4) Romantic and noncoital behaviors; (5) Condom/contraceptive use; (6) SRH knowledge; (7) SRH communication; (8) Early pregnancy; (9) Pornography use/exposure; and (10) Other (including topics explored in a total of four articles: pubertal comfort, sexual self-efficacy [perceived

control or confidence over one’s sexuality], and HIV/sexually transmitted infections [STIs]).

Sexual behavior was the most common outcome explored in about a third of articles (n = 41), with focus on penile-vaginal intercourse, early sexual debut, and multiple sexual partners. This was followed by sexual and dating violence (n = 34) including both victimization and perpetration. One article

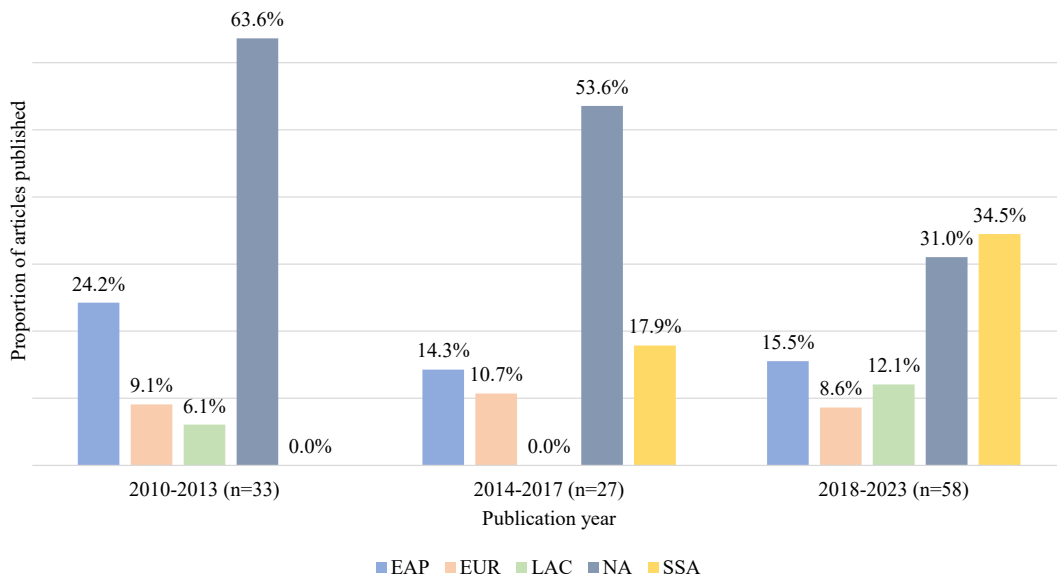


Figure 3. Trends in geographical distribution of the included articles, by time period of publication. The figure displays the proportion of articles reporting on research for each geographical region, according to time period (year) of publication (2010–2013, 2014–2017, 2018–2022). EAP = East Asia and Pacific; EUR = Europe and Central Asia; LAC = Latin America and Caribbean; NA = North America; SSA = sub-Saharan Africa. Articles reporting on global consolidated analyses of data from > 10 countries are excluded from the figure (n = 3).

Table 2
Sexual and reproductive health (SRH) outcomes assessed among young adolescents in the included articles (N = 118)

SRH-related outcomes			
Theme	Category	Nr. of articles	References
1. Sexual behaviors (n = 41)	Penile-vaginal sexual intercourse	27	[14–16,20,24,29–50]
	Early sexual debut	10	[33,51–59]
	Multiple sexual partners	8	[15,32,37,43,46,51,57,60]
	Transactional sex	3	[59–61]
	Sexual risk-taking (general)	2	[62,63]
	Oral sex	1	[42]
2. Sexual and dating violence (n = 34)	Sex under the influence of alcohol/drugs	1	[37]
	Dating violence victimization	14	[27,29,64–75]
	Dating violence perpetration	14	[27,64,66–72,76–80]
	Sexual violence victimization	10	[26,27,74,81–87]
	Sexual violence perpetration	8	[26,27,81,88–92]
	Reproductive coercion	1	[93]
3. Sexual attitudes, beliefs, and intentions (n = 23)	Sexual intentions	11	[23,28,49,63,94–100]
	Attitudes toward gender and sexuality	8	[17,18,101–106]
	Attitudes toward sexual violence	2	[107,108]
	Perceived SRH needs	1	[109]
4. Romantic and noncoital behaviors (n = 17)	Attitudes toward early pregnancy/childbearing	1	[110]
	Noncoital behaviors including sexting	13	[14,20,24,30,31,35,40,44,47,50,92,94,111]
	Romantic relationship involvement	7	[20,23,30,40,112–114]
5. Condom/contraceptive use (n = 15)	Condom use	12	[14,15,29,32,33,37,43,45,50,51,59,115]
	Contraceptive use	3	[57,60,116]
6. SRH knowledge (n = 6)	Comprehensive HIV knowledge	4	[19,117–119]
	SRH knowledge (general)	2	[120,121]
	Pregnancy knowledge	1	[19]
7. SRH communication (n = 6)	Caregiver SRH communication	6	[19,21,122–125]
	Peer SRH communication	2	[21,125]
8. Early pregnancy (n = 5)		5	[39,126–129]
9. Pornography use/exposure (n = 3)		3	[22,103,130]
10. Other topics (n = 4)	HIV/STIs	2	[119,131]
	Pubertal comfort	2	[19,132]
	Sexual self-efficacy	1	[19]

The table presents the SRH outcome themes and categories (subthemes) identified based on outcomes reported in the included articles.

Please note that some articles reported on more than one outcome category within a given theme.

(n) = total number of articles for each theme; Nr. of articles = number of articles for each category; STIs = sexually transmitted infections; HIV = human immunodeficiency virus; SRH = sexual and reproductive health.

reported on reproductive coercion [93]. About a fifth of articles (n = 23) reported on sexual attitudes, beliefs, and intentions, mainly intentions to have sexual intercourse and attitudes toward gender and sexuality. Seventeen of articles reported on romantic and noncoital behaviors, including experiences such as kissing, hugging, and touching with an intimate partner, and being in a romantic relationship. Condom and contraceptive use were explored in 15 articles, five reported on early adolescent pregnancy, and two on HIV/STI. SRH knowledge and SRH communication were explored by six articles, respectively, and three articles reported on pornography use among young adolescents. Finally, one article reported on risk/protective factors associated with sexual self-efficacy during early adolescence, and two articles reported on pubertal comfort. Although menstrual health was included in the list of search terms, no articles were included on this topic, mainly due to the older age range of the study samples (mean age > 14). Several of the aforementioned outcomes were also assessed as risk and protective factors for other SRH outcomes (e.g., SRH knowledge as a risk/protective factor for sexual attitudes).

Sexual and reproductive health risk and protective factors

As shown in Figure 4, most articles reported on risk/protective factors at the individual level (n = 98, 83.0%), followed by family (n =

69, 58.5%), peers (n = 39, 33.1%), and partners (n = 14, 11.9%) at the interpersonal level; school (n = 25, 21.2%) and community (n = 18, 15.2%). None of the included articles reported on macro or structural risk/protective factors for early adolescent SRH such as climate change, pandemics, or broader social norms. In addition, about one in four of the included articles explored factors at multiple levels.

Table 3 further maps the risk/protective factors examined across the SRH outcome areas, noting the geographical region(s) where the research was conducted. Below, we summarize key themes that emerged from these articles in terms of the focus, context, and measurement of risk/protective factors. We also give examples of findings in terms of the associations between risk/protective factors with SRH outcomes; however, all associations should be interpreted with caution as a quality assessment was not conducted given the scoping review design.

Individual. Among the 98 articles that reported individual-level risk or protective factors for early adolescent SRH outcomes (Table 3), the most commonly examined factors were substance use (n = 25) and attitudes, beliefs, and intentions toward sexuality/gender (n = 24).

Research on substance use and SRH spanned numerous geographies such as Nigeria [52], Uganda [122], South Africa [109], Brazil [58], and global consolidated analysis [16] and was mainly examined in relation to (risky) sexual behaviors.

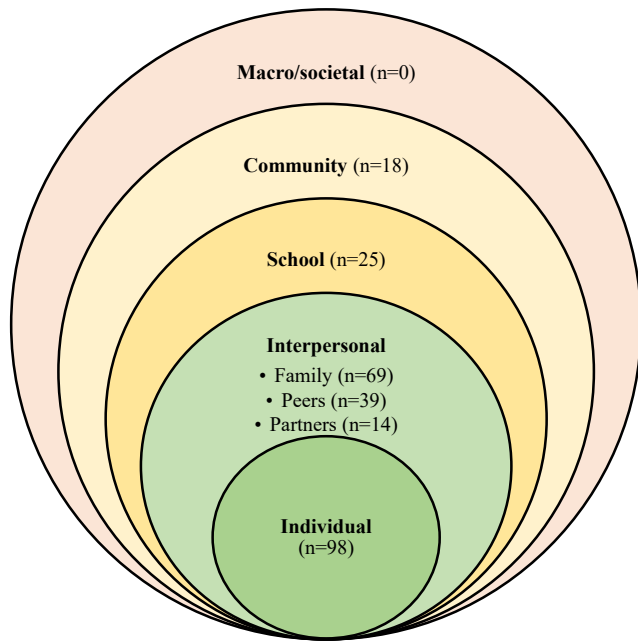


Figure 4. Distribution of risk/protective factors reported on in the included articles, by social-ecological levels. The figure displays the social-ecological level of the risk and protective factors assessed by the included articles. Given that some articles reported on factors at more than one level, the sum of articles displayed in the figure ($N = 265$) exceeded the total number of articles included in the review ($N = 118$).

Several articles ($n = 24$) at the individual level reported on sexual knowledge, attitudes, and behaviors as risk/protective factors for other SRH outcomes. Taken together, knowledge, attitudes, and behaviors were the second most common risk/protective factors explored across multiple outcomes and geographies. Within these articles, most examined associations between knowledge and attitudes as exposures for sexual behavior outcomes. Seven articles in which sexual behavior was treated as an exposure (rather than outcome) reported on this as a risk factor for sexual and dating violence victimization.

Psychosocial wellbeing ($n = 20$) and mental health ($n = 14$) were other prominent themes, explored in different world regions and mainly in relation to sexual behaviors and sexual and dating violence. Relatedly, 16 articles reported on childhood adversity as a risk factor for SRH. Several articles further explored the association between violence and bullying experiences ($n = 10$) and sexual/dating violence ($n = 9$) with SRH outcomes, and a similar number presented findings on the potential protective role of young adolescent's agency ($n = 10$). Internet, phone, and media use, including social media, was also reported as a potential risk factor affecting SRH ($n = 11$), primarily in relation to sexual attitudes, beliefs, and intentions, based on research from different world regions.

Other topics explored across multiple regions included sedentary/behavioral problems ($n = 8$) and religiosity ($n = 7$). In contrast, some risk/protective factors at the individual level were only examined in a single region, including cultural identification and acculturation ($n = 2$), discrimination exposure ($n = 1$), gambling ($n = 1$), and body/sexual comfort ($n = 1$)—all in North America, and early pregnancy and early marriage ($n = 3$) and condom use ($n = 1$) in sub-Saharan Africa.

Interpersonal—family. Of the 69 articles that reported family or household-level risk or protective factors, most focused on family socio-economic status ($n = 27$), family structure ($n = 26$), and parental closeness and parent/family support ($n = 23$). Family socio-economic status was examined primarily as a risk or protective factor for sexual behavior. In Korea, Lee, Song, and Choi [33] found that adolescents who perceived themselves as from wealthier families were more likely to engage in sexual behaviors, while Roman-Lay et al. [58] found that, among girls in Brazil, those from wealthier households had lower odds of early sexual debut. Family socio-economic status was also explored as a risk/protective factor for several other outcome categories, including SRH attitudes and intentions, sexual/dating violence, and romantic/noncoital behaviors. The role of family structure was mostly examined in relation to sexual attitudes, intentions, and behaviors in different world regions; for example, in the United States, Shreffler et al. [110] explored the relationship between having parents in union (rather than separated) and the likelihood of idealizing teen parenthood; and in Nigeria, Durowade et al. [52] examined the relationships between several family structure factors (who adolescent lives with, living mother, living father) and early sexual debut. Furthermore, parental monitoring and parental closeness were consistently found to be protective factors for a host of SRH outcome themes, mainly sexual behaviors across different geographies. The role of parent-child communication, as well as parental SRH communication specifically, was further reported on in a number of articles, mainly in East Asia Pacific and North America. For example, a study among young adolescent girls living in an urban area of the United States found that poorer parent-child communication was associated with greater likelihood of participation in noncoital behaviors such as spending time alone with a boy, kissing, and cuddling [113].

Family-level and household-level factors were generally reported by young adolescents themselves, including reports of parental attitudes [69], or family functioning factors such as parenting practices [39,44,61,127]. Research that collected data from other household members, such as mothers [63], or parent-adolescent dyads [92], was less common.

Interpersonal—peers. The most common factors explored by the 39 articles that reported peer-related risk/protective factors were peer attitudes/beliefs and peer pressure ($n = 16$), deviant peer influences ($n = 12$), followed by peer sexual/dating behavior ($n = 7$), and peer social connection and support ($n = 6$). Research on peer attitudes and beliefs commonly focused on relationships with sexual intentions [97–99] or favorable beliefs about sex [101] as well as whether peer norms related to sexual violence [26,77,88,107] shape exposure to such violence. Peer sexual and dating behavior was examined across multiple regions, although its association with sexual behavior was explored only in the North American context. Specifically, three articles conducted in the United States reported that young adolescents who believed their peers to be sexually active were more likely to be sexually active or engage in risky sexual behavior themselves [49,53,127]. Research primarily from North America further found positive associations between having deviant peers and sexual activity [29,34,42,49] as well as dating violence perpetration and victimization [67,78]. Research on peer social connection and support was conducted in multiple geographical regions. For example, articles explored whether close confiding friendships were associated with noncoital and coital behavior [24], and

Table 3

Matrix of risk/protective factors investigated in relation to early adolescent SRH outcomes in the included studies, published between 2010 and 2022

Individual (n = 98)											
Risk/protective factors	Region	SRH outcome theme									
		SRH knowledge	SRH attitudes/intentions	SRH communication	Sexual/dating Violence	Romantic/noncoital	Pornography	Sexual behavior	Condom/contraceptive use	Pregnancy	Other
Substance use (n = 25)	EAP		n = 4		n = 7						
	EUR		[47,95,104,109]		[29,67–69,73,76,79]						
	LAC										
	SSA										
	NA										
Attitudes, beliefs, intentions toward sexuality/gender (n = 24)	Global										
	EAP	n = 2		n = 6		n = 4					
	EUR	[71,80]		[28,36,50,94,96,109]		[67,72,79,84]					
	SSA										
	LAC										
Psychosocial wellbeing (n = 20)	NA										
	EAP	n = 1		n = 5		n = 2					
	EUR	[71]		[17,49,103,104,109]		[67,70]					
	SSA										
	NA										
Childhood adversity (n = 16)	Global										
	EUR		n = 3		n = 5						
	SSA		[56,95,110]		[26,67,70,88,89]						
	LAC										
	NA										
SRH knowledge* (n = 15)	Global										
	EAP	n = 2		n = 5		n = 1					
	SSA	[104,132]		[95,97,104,106,131]		[84]					
	LAC										
	NA										
Mental health (n = 14)	Global										
	EUR		n = 2		n = 3						
	SSA		[47,95]		[67,79,82]						
	LAC										
	NA										
Sexual behavior including sexting* (n = 14)	Global										
	EAP		n = 2		n = 7						
	EUR		[19,95]		[26,30,68,74,85–87]						
	SSA										
	NA										
Internet, phone, and media use (n = 11)	Global										
	EAP		n = 5		n = 2						
	EUR		[95,101,102,106,128]		[84,87]						
	SSA										
	LAC										
Violence/bullying experiences (n = 10)	Global										
	SSA		n = 4		n = 4						
	EUR		[16,23,94,102]		[67,77,79,133]						
	LAC										
	NA										
Agency (n = 10)	Global										
	EAP		n = 5		n = 2						
	SSA		[17,19,95,96,100]		[19,21]						
	LAC										
	NA										
Sexual or dating violence* (n = 9)	Global										
	EUR				n = 7						
	LAC				[27,66,69,70,81,91,133]						
	SSA										
	NA										
Sedentary/behavioral problems (n = 8)	Global										
	EAP				n = 1						
	LAC				[69]						
	SSA										
	NA										
Religiosity (n = 7)	Global										
	EAP		n = 3		n = 1						
	SSA		[19,95,103]		[19]						
	LAC										
	NA										
Early pregnancy* and early marriage (n = 3)	Global										
	SSA		n = 1								
	LAC		[119]								
	SSA										
	NA										
Conflict management and refusal/avoidance skills (n = 4)	Global										
	LAC		n = 1		n = 1						
	SSA		[110]		[79]						
	LAC										
	NA										
Work experience and extra-curricular activities (n = 3)	Global										
	SSA		n = 1		n = 1						
	LAC		[95]		[82]						
	SSA										
	NA										

(continued on next page)

Table 3
Continued

Individual (n = 98)		SRH outcome theme									
Risk/protective factors	Region	SRH knowledge	SRH attitudes/intentions	SRH communication	Sexual/dating violence	Romantic/noncoital	Pornography	Sexual behavior	Condom/contraceptive use	Pregnancy	Other
Aspirations (n = 2)	SSA	n = 2	n = 2	n = 1	n = 5	n = 4	n = 2	n = 13	n = 2	n = 1	
	NA	[17,95]			[26,27,67,77,82]	[20,24,30,113]	[103,130]	[20,24,30,38,42,48,55,56,58,59,61,62,127]	[115,127]	[127]	
	NA										
	NA										
	NA										
	NA										
Cultural identification and acculturation (n = 2)	NA	n = 1	n = 1	n = 4	n = 3	n = 4	n = 2	n = 12	n = 2	n = 1	
	NA	[47]	[47]	[21,111,122,123]	[73,78,79]	[20,24,111,113]	[22,103]	[20,24,31,39,42,46,52,57,58,60,61]	[37,57]	[39]	
Discrimination exposure (n = 1)	NA	n = 1	n = 1	n = 4	n = 3	n = 4	n = 2	n = 9	n = 2	n = 1	
	NA	[95]	[95]	[19,49,95,101,103,110]	[67,79,83]	[20,24,113]	[22,103]	[15,20,24,32,46,55,57,62,121]	[37,57]	[39]	
Gambling (n = 1)	SSA	n = 1	n = 1	n = 4	n = 3	n = 4	n = 2	n = 9	n = 2	n = 1	
	SSA	[109]	[109]	[19,49,95,101,103,110]	[67,79,83]	[20,24,113]	[22,103]	[15,20,24,32,46,55,57,62,121]	[37,57]	[39]	
Condom use* (n = 1)	SSA	n = 1	n = 1	n = 4	n = 3	n = 4	n = 2	n = 9	n = 2	n = 1	
	SSA	[109]	[109]	[19,49,95,101,103,110]	[67,79,83]	[20,24,113]	[22,103]	[15,20,24,32,46,55,57,62,121]	[37,57]	[39]	
Body/sexual comfort* (n = 1)	NA	n = 1	n = 1	n = 4	n = 3	n = 4	n = 2	n = 9	n = 2	n = 1	
	NA	[115]	[115]	[19,49,95,101,103,110]	[67,79,83]	[20,24,113]	[22,103]	[15,20,24,32,46,55,57,62,121]	[37,57]	[39]	
Interpersonal – family (n = 69)											
Risk/protective factors		SRH outcome theme									
Risk/protective factors	Region	SRH knowledge	SRH attitudes/intentions	SRH communication	Sexual/dating violence	Romantic/noncoital	Pornography	Sexual behavior	Condom/contraceptive use	Pregnancy	Other
Family socio-economic status (n = 27)	EAP	n = 1	n = 5	n = 1	n = 5	n = 4	n = 2	n = 13	n = 2	n = 1	
	EUR	[118]	[23,40,49,103,110]	[122]	[26,27,67,77,82]	[20,24,30,113]	[103,130]	[20,24,30,38,42,48,55,56,58,59,61,62,127]	[115,127]	[127]	
	LAC										
	NA										
Family structure (n = 26)	SSA	n = 6	n = 6	n = 4	n = 3	n = 4	n = 2	n = 12	n = 2	n = 1	
	EUR	[19,49,95,101,103,110]	[19,49,95,101,103,110]	[21,111,122,123]	[73,78,79]	[20,24,111,113]	[22,103]	[20,24,31,39,42,46,52,57,58,60,61]	[37,57]	[39]	
	LAC										
	NA										
Parental closeness and parent/family support (n = 23)	EAP	n = 5	n = 5	n = 4	n = 3	n = 4	n = 2	n = 9	n = 3	n = 3	
	EUR	[17,19,71,95,119]	[17,19,71,95,119]	[19,21,122,123]	[67,79,83]	[20,24,113]	[22,103]	[15,20,24,32,46,55,57,62,121]	[32,37,57]	[39]	
	LAC										
	NA										
Parental monitoring (n = 18)	SSA	n = 1	n = 1	n = 1	n = 3	n = 3	n = 1	n = 10	n = 1	n = 1	
	EUR	[95]	[95]	[21]	[67,70,79]	[24,30,111]	[22]	[24,30,31,39,42,46,56,57,59,92]	[57]	[39]	
	LAC										
	NA										
Parental SRH communication* (n = 11)	SSA	n = 3	n = 3	n = 3	n = 3	n = 1	n = 1	n = 4	n = 1	n = 1	
	EUR	[71,106,109]	[71,106,109]	[122,124,125]	[70,89]	[111]	[111]	[32,34,42,109]	[32]	[32]	
	LAC										
	NA										
Parental/caregiver education (n = 9)	SSA	n = 1	n = 1	n = 1	n = 1	n = 1	n = 1	n = 7	n = 2	n = 1	
	EUR	[95]	[95]	[122]	[79]	[24,113]	[24,113]	[15,37,39,42,53,57,58]	[37,57]	[39]	
	LAC										
	NA										
Family functioning (n = 9)	SSA	n = 1	n = 1	n = 1	n = 2	n = 1	n = 1	n = 6	n = 1	n = 1	
	EUR	[49]	[49]	[123]	[70,89]	[44]	[130]	[44,49,55,61,92,127]	[127]	[127]	
	LAC										
	NA										
Parent-child communication (n = 7)	SSA	n = 3	n = 3	n = 1	n = 1	n = 2	n = 1	n = 1	n = 2	n = 1	
	EUR	[71,95,106]	[71,95,106]	[123]	[79]	[24,113]	[24,113]	[24]	[37,57]	[39]	
	LAC										
	NA										
Immigrant background (n = 7)	SSA	n = 2	n = 2	n = 1	n = 2	n = 1	n = 1	n = 4	n = 1	n = 1	
	EUR	[48,128]	[48,128]	[21]	[70,89]	[44]	[130]	[38,49,55,61]	[127]	[127]	
	LAC										
	NA										
Parental attitudes (n = 7)	SSA	n = 4	n = 4	n = 1	n = 2	n = 1	n = 1	n = 2	n = 1	n = 1	
	EUR	[63,96–98]	[63,96–98]	[122]	[65,67]	[96]	[96]	[31,96]	[116]	[116]	
	LAC										
	NA										
Caregiver SRH knowledge (n = 2)	SSA	n = 1	n = 1	n = 1	n = 2	n = 1	n = 1	n = 1	n = 1	n = 1	
	SSA	[122]	[122]	[122]	[65,67]	[96]	[96]	[31,96]	[116]	[116]	
Parental health and health behaviors (n = 1)	NA	n = 1	n = 1	n = 1	n = 2	n = 1	n = 1	n = 1	n = 1	n = 1	
	NA	[122]	[122]	[122]	[65,67]	[96]	[96]	[31,96]	[116]	[116]	

Interpersonal – peers (n = 39)										
Risk/protective factors										
Region	SRH outcome theme			SRH-related outcome			SRH outcome theme			
	SRH knowledge	SRH attitudes/intentions	SRH communication	Sexual/dating violence	Romantic/noncoital	Pornography	Sexual behavior	Condom/contraceptive use	Pregnancy	Other
Peer attitudes/beliefs and peer pressure (n = 16)	EAP NA n = 2 [105,120]	n = 7 [23,51,96–98,107,119]	n = 1 [123]	n = 4 [26,78,88,107]	n = 2 [86,112]	n = 1 [22]	n = 3 [34,42,96]	n = 1 [116]		
Deviant peer influences (n = 12)	SSA n = 3 [28,47,95]	n = 3 [28,47,95]	n = 1 [123]	n = 3 [67,79,81]	n = 1 [113]		n = 5 [32,34,39,47,121]	n = 1 [32]	n = 1 [39]	
Peer sexual/dating behavior (n = 7)	EAP n = 1 [120]	n = 2 [99,104]					n = 3 [32,53,127]	n = 2 [32,127]	n = 1 [127]	
Peer social connection and support (n = 6)	LAC n = 1 [119]		n = 1 [21]	n = 1 [79]	n = 1 [24]		n = 3 [24,37,46]	n = 1 [37]		
Pregnant/parenting peers (n = 2)	NA n = 1 [101]						n = 1 [31]			
Peer SRH communication (n = 1)	NA n = 1 [107]		n = 1 [125]							
Peer group composition (n = 1)	NA n = 1 [107]			n = 1 [107]						
Peer prosocial behavior (n = 1)	NA n = 1 [107]			n = 1 [107]						
Peer dating violence (n = 1)	NA n = 1 [79]			n = 1 [79]						
Interpersonal – partners (n = 14)										
Risk/protective factors										
Region	SRH-related outcome			SRH-related outcome			SRH-related outcome			
	SRH knowledge	SRH attitudes/intentions	SRH communication	Sexual/dating violence	Romantic/noncoital	Pornography	Sexual behavior	Condom/contraceptive use	Pregnancy	Other
Romantic relationship involvement* (n = 12)	EAP n = 6 [19,63,72,95,104,108]	n = 1 [19]	n = 1 [19]	n = 3 [69,76,79]	n = 1 [22]		n = 2 [31,40]			
Sexual risk communication (n = 2)	EUR n = 1 [28,32]						n = 1 [32]	n = 2 [28,32]		
School (n = 25)	LAC n = 1 [28,32]									
NA n = 2 [28,32]										
School (n = 25)										
Risk/protective factors										
Region	SRH outcome theme			SRH-related outcome			SRH outcome theme			
	SRH knowledge	SRH attitudes/intentions	SRH communication	Sexual/dating violence	Romantic/noncoital	Pornography	Sexual behavior	Condom/contraceptive use	Pregnancy	Other
School belonging and connectedness (n = 12)	EAP n = 1 [71]	n = 1 [104]		n = 2 [27,89]	n = 3 [20,24,44]	n = 1 [22]	n = 7 [20,24,35,39,44,55,62]	n = 1 [39]		
Academic performance (n = 8)	EUR n = 1 [27,89]		n = 1 [21]	n = 2 [79,89]	n = 1 [20]		n = 4 [20,34,38,42]			
Educational aspirations (n = 6)	LAC n = 1 [19]		n = 1 [19]		n = 1 [20]		n = 5 [20,34,37,52,62]	n = 1 [37]		
School safety (n = 5)	EUR n = 1 [19]		n = 1 [19]	n = 2 [27,89]			n = 2 [43,62]			
School type and composition (n = 3)	SSA n = 1 [118]		n = 1 [19]				n = 2 [38,58]	n = 1 [38]		

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Table 3
Continued

School (n = 25)											
Risk/protective factors	Region	SRH outcome theme									
		SRH knowledge	SRH attitudes/intentions	SRH communication	Sexual/dating violence	Romantic/noncoital	Pornography	Sexual behavior	Condom/contraceptive use	Pregnancy	Other
Truancy (n = 2)	NA	n = 1	n = 1			n = 2		n = 2			
	SSA	[35]	[35]			[20,35]		[20,35]			
SRH education (n = 1)	EAP	n = 1									
		[118]									
Educational subsidy (n = 1)	SSA							n = 1			
								[59]			
Community (n = 18)											
Risk/protective factors	Region	SRH outcome theme									
		SRH knowledge	SRH attitudes/intentions	SRH communication	Sexual/dating violence	Romantic/noncoital	Pornography	Sexual behavior	Condom/contraceptive use	Pregnancy	Other
Neighborhood cohesion and safety (n = 9)	EAP		n = 1	n = 1	n = 1		n = 1	n = 5	n = 2		
	EUR		[17]	[21]	[79]		[22]	[20,46,55,57,62]	[20,57]		
	SSA										
	LAC										
	NA										
Neighborhood resources and poverty (n = 5)	SSA		n = 1		n = 3			n = 1			
	NA		[17]		[73,78,121]			[62]			
Community attitudes (n = 5)	EAP		n = 4						n = 1		
	SSA		[16,17,105,131]						[116]		
Healthcare experiences (n = 4)	EAP		n = 2					n = 1	n = 1	n = 1	
	NA		[119,131]					[57]	[57]	[129]	
	SSA										
Neighborhood disorder (n = 2)	EAP			n = 1				n = 1	n = 1		
	SSA			[21]				[57]	[57]		
	LAC										
	NA										

* Risk/protective factors that were also examined as SRH outcomes by some of the included articles. Macro—no studies identified. The matrix shows the risk/protective factors reported on in the included articles, organized by social-ecological levels. The most commonly reported factors are listed first, and mapped across the SRH-related outcome areas. Psychosocial well-being includes the following categories: youth development, cognitive/behavioral competence, spiritual cognition, achievement motivation, prosocial attributes, and loneliness.

SRH = sexual and reproductive health; EAP = East Asia and Pacific; SSA = Sub-Saharan Africa; LAC = Latin America and Caribbean; NA = North America; EUR = Europe and Central Asia.

whether social support from friends was associated with condom use [32] or the frequency of sexual behavior [41].

Most research on peer-level factors was based on reports of what respondents believe about peers. A few articles applied analytic techniques such as network analysis [107] or aggregating responses to identify norms within one's class [77].

Interpersonal—romantic/intimate partners. Involvement in a romantic relationship was the dominant factor examined by the 14 articles at this level and was studied across multiple geographies. This research mainly examined the (negative) influence of early adolescent romantic relationships on sexual attitudes, beliefs, and intentions. In the United States, one study found that discussing more sexual health topics with one's partner was associated with more frequent condom use [125]. Another study explored whether communication about sex with one's partner was associated with greater sexual risk behaviors among a sample of African-American girls who were seeking psychiatric care [49].

School. Of the 25 articles that reported on school-related risk/protective factors, most focused on school belonging and connectedness ($n = 12$), academic performance ($n = 8$), and educational aspirations ($n = 6$). Articles examining school-based factors were generally done using North American ($n = 8$) or East Asian ($n = 6$) samples, while only one study examined school-based factors with a Latin American sample [58] and just two covered multiple geographic regions [21,22]. Relationships between school belonging/connectedness and sexual behaviors were explored in seven studies. Minnis et al. [55], for example, found that greater school connectedness was associated with lower risk of early sexual initiation among a sample of Latinx adolescents in the United States, while in England, Phillips-Howard et al. [134] found that sexual activity was more common among those who thought school was not a nice place to be. In Korea [33], and in the United States [29], better academic performance was associated with lower likelihood of sexual behavior, although Markham et al. [37] did not find such a relationship in a sample of American Indian and Alaska Native youth.

Similar to articles focusing on interpersonal factors, most measures of school-related factors were based on young adolescent's reports, such as perceived teacher connectedness.

Community. The 18 articles that reported on community-level risk/protective factors focused on a diverse range of exposures and outcomes. They mainly focused on neighborhood cohesion and safety ($n = 9$) as well as neighborhood resources and poverty ($n = 5$) and community attitudes ($n = 5$), although the majority of associations were only investigated by one or two articles. The most common relationship investigated was between the theme of neighborhood cohesion and safety and the outcome of sexual behavior. In the United States, Ritchwood et al. [41] found that perceptions of greater community support were associated with a higher number of sexual partners, while Minnis et al. [55] and Orihuela et al. [57] found that more social control and efficacy in the neighborhood was associated with later sexual debut. The influence of community attitudes about SRH on adolescents' SRH attitudes and intentions were explored by four articles, including three qualitative [17,23,105] articles. Additionally, Dombola et al. [116] conducted a qualitative exploration of the ways community

attitudes about contraceptives shape contraceptive use among adolescents.

Discussion

A decade ago, the global community led by the World Health Organization called for more research on risk and protective factors associated with young adolescents' SRH with priority given to studies in contexts with high proportions of sexually active adolescents, and where early childbearing is more prevalent—particularly in LMICs. Findings from the present review indicate that there has been increased attention to this field during the second decade of the 21st century, particularly since 2018. We found that articles have explored a range of different outcomes and exposures, using (mostly) validated measures, with both males and females and across different geographical settings. While this growing attention to the drivers of early adolescent SRH is promising, gaps remain—particularly related to the context, focus, and conceptualization of peer-reviewed research. As our review has shown, North America is disproportionately represented in the literature as are individual factors. Additionally, the focus has been on negative SRH outcomes (e.g., violence). Below, we discuss these gaps in more detail and provide four recommendations for key research priorities to further advance the field in the coming decade and beyond.

Closing the geographical gap—continue investing in research in contexts with the greatest sexual and reproductive health needs

First, we found that the geographical distribution of peer-reviewed articles published in the last decade remains significantly skewed toward high-income countries, particularly in North America. However, we also found that this geographical gap—which has been highlighted in other studies [135]—is narrowing, with a larger share of articles conducted in the second half of the decade focusing on sub-Saharan Africa. Nonetheless, there is need for continued investments in research on what drives early adolescent SRH in LMICs that are home to approximately 90% of adolescents and where the risks for adverse outcomes such as early pregnancy and childbearing are highest due to poverty and limited access to health services. None of the included articles reported on research from the MENA region, and only one article in this review [17] was conducted in a humanitarian setting. That article was one of several published as a part of special supplement to the journal *Conflict and Health* that examined the lived experiences of young adolescents in refugee settings in Ethiopia, Lebanon, and Thailand. The United Nations High Commission for Refugees estimates that 110 million children, women, and men have been displaced in various humanitarian crises globally [136]. Humanitarian crises increase the risk for sexual violence particularly for girls. Furthermore, disruption of schooling and health services, as well as the breakdown of social support networks, can expose young adolescents to poor SRH outcomes. As the risk for humanitarian crises escalates with rising conflict and extreme weather conditions, there is an urgent need for research to understand the SRH needs of young adolescents in these settings to inform the design of services to meet those needs.

Focus on understanding the broader social-structural drivers of young adolescents' sexual and reproductive health

Second, a substantial majority of the included articles focused on risk and protective factors at the individual level, followed by interpersonal factors. Few focused on school or community factors, such as school health services or the influence of cultural beliefs and practices, and no articles examined modifiable macro-level risk and protective factors. In addition, there has been no real change over the past decade in the number of articles that focused on multiple levels concurrently. Thus, there is need for more research that examines the broader social-structural determinants of SRH, including distal factors such as laws or policies, social norms, politics, and significant national or global events such as the COVID-19 pandemic, climate change or conflict—especially given growing attention on these macro-level factors in the broader field of adolescent health [137–143]—as well as their interactions with factors at other social-ecological levels. Furthermore, while a relatively large number of articles set out to examine gender-related norms as drivers of SRH, the bulk of these papers focused on individual attitudes or beliefs—echoing previous recommendations that further research is needed to understand how social norms related to gender and sexuality affect SRH outcomes among young adolescents [144,145]. There are also opportunities to improve measurement beyond the individual level, for example, by aggregating data to calculate norms at the peer or community levels, or by using qualitative methods as was done by Ortiz-Echevarria et al. [17] in their use of focus-group discussions to examine gender norms. In addition, the fact that many studies are conducted in schools provides ample opportunity to collect additional data on school contexts [146].

Move beyond risk factors to better understand those that are protective or promote sexual and reproductive health

Third, we found that most of the reviewed articles remain negatively oriented in that they focus on factors that put young adolescents at risk for adverse SRH outcomes rather than those that are protective or promote health. This was particularly true for the large number of articles reporting on individual-level factors (e.g., harmful attitudes) as well as peer influences (e.g., deviant peers), and mainly in the context of sexual and dating violence and sexual (risk-taking) behaviors. In contrast, we found that articles reporting on parental factors (such as monitoring, and closeness) as well as school factors (such as teacher connectedness) were more positively oriented; and these studies focused on a broader range of SRH outcomes.

The prevailing focus on (sexual) risk is not surprising given the young age of participants, for whom issues related to sexuality can be both ethically and socially challenging to research [146]. Nonetheless, studies conducted in diverse settings such as Indonesia [19], Ecuador, and Uganda [147] have demonstrated both the feasibility and utility of researching early adolescent SRH from a positive perspective. There is need for more research on what promotes SRH and wellbeing during this critical period of life, and that draw on a broader range of measures to capture “soft” outcomes such as agency, resilience, and comfort in relation to one’s body, pubertal development, and sexuality [13].

In addition, very few of the included articles reported on early adolescent pregnancy and HIV/STI, which is (again) understandable given the young age of the study population. However,

nearly 500,000 girls aged 10–14 years gave birth globally in 2021, and 67% of these births were reported among girls in sub-Saharan Africa [148]. Given the significant health and developmental consequences associated with early pregnancy [149,150], further studies to understand what protects girls from early pregnancy are warranted, particularly in sub-Saharan Africa.

Disaggregate findings for young adolescents in studies with broader populations

Fourth, some articles were excluded in this review because they did not disaggregate analysis and findings for young adolescents specifically. For example, several articles on menstrual health—a topic that is highly relevant to early adolescence and for which we expected to find numerous articles—were not included since the mean age of the total sample was more than 15 years; and while some articles presented the proportion of 10–14-year-olds in the sample, they did not conduct stratified analysis for this age group. Similarly, a recent 12-country feasibility study of adolescent health indicators—many of which relate to SRH, found that most countries lack disaggregated data for young adolescents despite this being mandated in the indicator definition, thereby limiting their implementation [151]. These findings underscore the need to not only include young adolescents in SRH research but also to specifically stratify analysis and results for this age group.

Adopt longitudinal, mixed-methods designs

Concerning the measurement of risk and protective factors, experts at the 2010 HRP technical consultation underscored the importance of understanding the pathways through which protective factors at multiple levels can be strengthened as part of efforts to create a more enabling environment for adolescents' health. However, this review finds that two-thirds of articles across the reviewed years used cross-sectional designs, which preclude causal inferences. The field needs studies that adopt longitudinal designs that enable an understanding of antecedent risk and protective factors, as well as the pathways to SRH outcomes; and donors need to better understand the practical applications that such improved knowledge can have. Such longitudinal research needs to use a mix of both qualitative and quantitative methods to demonstrate both associations between SRH outcomes with risk/protective factors, as well as *why* and *how* such factors shape health and wellbeing. The growing number of articles reporting on qualitative and participatory research methods is thus promising.

Strengths and limitations

Findings from this review should be interpreted in light of several limitations. First, given the nature of the scoping review design, our findings reflect what has been reported on in the peer-reviewed research, but do not tell us about the quality of the included articles. Future systematic reviews will be important to determine the evidence-base of risk/protective factors for early adolescent SRH. Second, by limiting our review to peer-reviewed articles published in English (due to time and resource constraints), we may have missed relevant articles published in other languages, or articles that were published in the grey literature. However, we expect that our search covered a substantial breadth of existing research given evidence that three-

quarters of research in peer-reviewed journals is published in English [152]. That said, future analyses would benefit from broader language inclusion especially because of the paucity of research coming from the MENA region. Additionally, while we included a broad range of search terms, we may have missed some eligible articles; and the fact that we focused on modifiable factors means that we did not review research that (only) examined the influence of demographic factors such as age, sex, gender identity, or ethnicity. Finally, articles reporting on the effect of interventions or programs to improve early adolescent SRH were beyond the scope of the present review. However, our review broadly maps out the breadth of recent research on modifiable risk and protective factors associated with young people's SRH and highlights critical gaps for further research and interventions.

Conclusions

This review identified a growing body of peer-reviewed research on the risk and protective factors for young adolescents' SRH. However, we also found that many articles fail to disaggregate data by age, limiting our understanding of the drivers of SRH outcomes for young adolescents specifically. While the geographical distribution of peer-reviewed articles published in the last decade remains skewed toward high-income countries, particularly in North America, there is a growing focus on research in sub-Saharan Africa, which continue to have some of the world's poorest SRH indicators. Continued investment in research in contexts with the greatest SRH needs is essential to inform services and programs that can reduce global inequalities in young adolescents' SRH. Furthermore, existing research concentrates on individual and interpersonal factors and more effort is needed to deepen the understanding of broader socio-structural determinants of early adolescent SRH, such as laws and policies, and global events including pandemics, climate change, and conflicts. Finally, if the research is to better guide the design of interventions, researchers must adopt designs that allow for causal inferences and that demonstrate the pathways through which risk and protective factors lead to SRH outcomes.

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Supplementary Data

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