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REVIEW ARTICLE

Health risk behaviour prevention/intervention programmes targeted at youth/adolescents engaging in risky behaviour—a scoping review

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Abstract

Background Youth in disadvantaged socio-economic circumstances in South Africa face significant risks to their physical and mental well-being due to exposure to harmful behaviours. More than 50% of the global disease burden is attributed to non-communicable diseases linked to such behaviours. While interventions have been initiated to address these risks, the limited reduction in risky behaviour necessitates closer examination and the exploration of more targeted or innovative approaches for effective mitigation.

Objectives To explore existing health risk behaviour prevention/intervention programmes targeting youth, focusing on decreasing risky behaviour engagement and to discuss the success of the intervention used.

Methods Three electronic databases were searched from 2009 until November 2023. Studies specifically reported using an intervention programme in youth or adolescents aged 9 to 19 were included. Data extracted included age, grade, sample size, targeted risky behaviour, and outcome.

Results A total of 1072 articles were screened across three major databases, and of the nine included studies, $n=7$ yielded mild to moderate intervention success results. The use of incentives yielded unsuccessful results. The most successful intervention strategy identified was school-based intervention programmes targeting multiple risky behaviours.

Conclusion School interventions combining counselling, electronic screening, and personalized feedback effectively modified behaviour, while incentive-based programs had minimal impact. This underscores the importance of targeted interventions to discourage risky behaviour among young people.

Clinical implications Effective intervention and prevention programs targeting health risk behaviours in youth are essential in safeguarding their mental and physical well-being. A clear link between risky behaviour engagement and the potential development of non-communicable diseases or trauma should be emphasised.

Keywords Risky behaviour · Prevention · Intervention · Programme · Youth · Adolescence

Introduction

The South African health system has experienced dramatic fluctuations since the abolishment of Apartheid in 1994. Despite efforts to reduce both social and economic inequality within the system, the exposure of youth from more disadvantaged socio-economic circumstances to behaviours that place them at risk of either physical or mental harm has remained a consistent problem in South Africa. Non-communicable diseases (NCD) linked to risky behaviour account for more than 50% of the global disease burden (Benziger et al. 2016). From 2007 to 2019, a decrease in the overall mortality rate was noted in South Africa (Achoki et al. 2022). However, an alarming exception to this generally positive trend is the noteworthy increase in adolescent mortality in both males and females during the same period (Achoki et al. 2022).

Although numerous interventions have been conducted to mitigate risky behaviours, young people continue to engage in unsafe sex, binge drinking, the use of illicit drugs and violent activities (Khuzwayo et al. 2020). The relative lack of

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change in these risky behavioural choices could be attributed to the lack of consistency and structure when developing interventions, and to the focus on adolescent intervention strategies rather than targeting a younger pre-adolescent age group. Studies focussing on intervention strategies often suffer from heterogeneous methodologies and do not report details of the interventions, making replication and application difficult for determining who may benefit and in which circumstance (Wong et al. 2023). Some programmes emphasise skills development, while others emphasise harm reduction (Pharaoh et al. 2014). In truth, most non-communicable diseases are modifiable/preventable by behavioural changes, accepting responsibility for one's health, and adopting a healthy lifestyle (Betty et al. 2017).

Health risk behaviour prevention/intervention programmes are defined as methods, activities, or interventions that endeavour to reduce or deter specific or predictable behaviours, protect the current state of well-being, and promote desired outcomes or behaviours of an individual or community (Prinz 2016). The development of community-based youth programs should include purposeful environments encouraging positive and beneficial, sustainable relationships with both peers and adults (Perkins and Borden 2003). Thus, the active engagement of youth as a stakeholder in developing the content of intervention programmes is postulated to significantly increased buy-in, participation, and success of the intervention programme (Pharaoh et al. 2014). Previously implemented approaches to prevention programmes include school-based programmes, family/parenting-based programmes, community-based programmes, and the multi-domain approach (which involves a combination of the individual, family, school, and community elements), as well as mass-media intervention and access and marketing restrictions (Pharaoh et al. 2014).

It is evident that there is a need to establish a baseline of current literature regarding intervention/prevention programmes. Thus, the aim of this scoping review is to identify and collate recent literature focussing on health risk behaviour intervention/prevention programmes targeting adolescents, preadolescents, and youth, and to report on their effectiveness at reducing risky behaviours in that population.

Methods

This scoping review was conducted following the framework designed by Arksey and O'Malley (Arksey and O'Malley 2005) and reported according to the PRISMA guidelines.

Data sources and search strategy

A total of three computerised databases were accessed for this review, initially accessed through the University of KwaZulu–Natal Library (September 2022), and subsequently updated through the University of Witwatersrand Library (November 2023). Each of the databases included: PubMed, Cochrane Library, and EBSCOhost (APA PsycINFO; Global Health; Psychology and Behavioural Science Collection and CINAHL) were independently searched by two researchers (KD and IH) using variations of the following main search terms: 'health risk behaviour (MESH)'; 'prevention'; 'youth OR adolescents'; 'intervention OR strategies."

Study selection

Once the searches were completed and duplicates removed, the relevant titles and abstracts were independently screened by KD and IH. A third independent reviewer (HP) was consulted if any disagreements between the reviewers could not be resolved. Full-text article inclusion followed the same screening procedure until the final full-text inclusions were determined. Each full-text article included in the final analysis was independently assessed using inclusion and exclusion criteria. Original research and articles published in English between 2009 and 2023, explicitly reporting on an intervention programme, were included in the review.

Inclusion criteria

- All articles published in the period 2009–2023 on the development of health risk prevention programmes or workshops amongst the youth, with a focus on the last 15 years.
- Age: adolescents and youth aged 9–19 years old.
- Content: developed or implemented risk behaviour prevention programmes. However, not limited to prevention only but may also include reduction and intervention.

Exclusion criteria

- Any articles that do not include youth or adolescence.
- Risk-behaviour programmes that do not focus on health.
- Risk-behaviour programmes targeting HIV prevention and not specifically risky sexual behaviour.
- Articles not written in English or peer-reviewed.

Charting the data

The adapted "JBI Data Extraction Form" was used to extract data from the designated articles. Data from eligible studies were chartered using a standardized data-extraction tool

designed for this study. The tool captured the relevant information on key study characteristics and detailed information on all metrics used to describe health risk behaviour prevention/intervention programmes on youth/adolescents engaging in risky behaviour. Researchers reviewed each article for the necessary information. Any reviewer disagreements were resolved through discussion or with an additional revieweror reviewers.

Collating, summarizing, and reporting the results

The results of each study were summarised in a narrative form. Homogenous data was grouped with similar themes and trends highlighted, and non-homogenous data was described in a more narrative approach. The articles were evenly divided between the researchers, with each paper being reviewed by two researchers. The researchers independently extracted and analysed data, and if a disagreement was encountered, a third researcher was called upon to re-evaluate the situation.

Ethical considerations

This article followed all ethical standards for research without direct contact with human or animal subjects. Ethical approval was applied for and approved via the University of KwaZulu Natal Ethics Board (Study approval number: HSSREC/00004179/2022).

Results

A total of 1072 articles were screened across the three major databases. After title screening, duplicate removal, and abstract screening, 17 articles remained. Of the 17 remaining

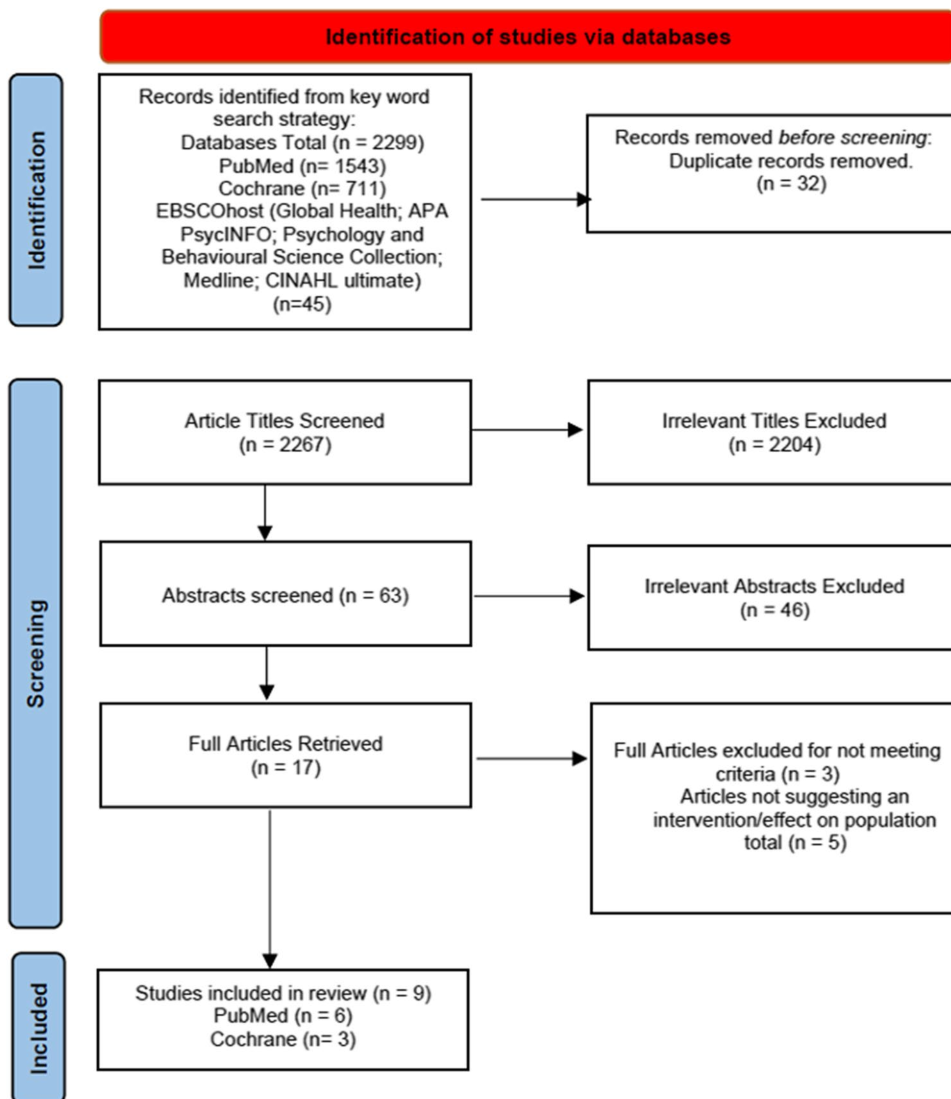

Fig. 1 The PRISMA flow diagram

Table 1 Summary of interventions

Author and study design	Year	Country	Sample size	Age (years) or grade	Health risk behaviour targeted	Type of intervention/ behaviour modification	Behaviour modification/ intervention effective	Authors' conclusion
Pasch, KE et al. Design: nested randomised cluster design	2009	USA	n =4658	Grade 6	Alcohol use	Self-administered questionnaire	Moderately effective with suggestions for improved efficacy	Results suggest that all youth should receive prevention programs, with specific messages about alcohol use prior to sixth grade. High-risk students should receive developmentally appropriate messages about academic achievement, conduct, and peer influence. Parent involvement in prevention programs is crucial
Bartlett, R. et al. Design: one group pre-test/post-test	2018	USA	n =29 Girls (n = 15) Mothers (n = 14)	Grades: 6; 7; 8 Age: 11—14	Risky sexual behaviour	Group education sessions for mothers and daughters. Girls participated in service-learning activities in the community (2 h per week for 6 weeks)	Moderately effective	There were demonstrated improvements in self-efficacy in condom communication and condom consistency, as well as mother–teen sexual risk communication. Girls not yet sexually active maintained this status for 3 months post-intervention, and some girls decreased their risky sex behaviours at 3 months post-intervention
McCarty, CA. et al. Design: randomised clinical trial	2019	India	n=148 Intervention (n= 73) Control (n= 75)	Age: 13–18	Alcohol and Marijuana	School-based health centre visit (motivational counselling)	Mildly effective	School-based health center (SBHCs) appears to be an excellent venue for delivery of brief substance-use interventions; doing so may reduce the amount of alcohol used by adolescents without detracting from their positive experiences and satisfaction with care. The use of an electronic screening tool did not contribute to better outcomes overall

Table 1 (continued)

Author and study design	Year	Country	Sample size	Age (years) or grade	Health risk behaviour targeted	Type of intervention/ behaviour modification	Behaviour modification/ intervention effective	Authors' conclusion
Richardson L.P et al. Design: randomised clinical trial	2019	USA	$n=300$ Intervention (n = 147) Control (n = 143)	Age: 13–18	Multiple	Intervention: Electronic screening with feedback on intention to treat basis Control:	Moderately effective	Electronic screening with personalized feedback requires minimal training and clinician time for implementation, and may be an effective strategy for delivering preventive and risk reduction counselling to youths

full-text articles, six were excluded for not meeting the criteria, and a further two did not suggest an effect of interventions on the population total (Fig. 1).

The nine remaining articles included full-text articles were divided into study types and summarised in table format. The study types were: (a) interventions (Table 1), including randomised control trials ($n=2$), pre/post-test design ($n=1$) and nested randomised cohort ($n=1$), (b) systematic reviews (Table 2, $n=2$) and (c) Cochrane reviews (Table 3, $n=3$).

The earliest study included in this scoping review was published in 2009, with the latest published in 2019. Most intervention studies were published in the USA ($n=3$), with the remaining ones in India. Systematic and Cochrane reviews were published in developed countries, including the USA, Canada, the UK, Italy, and Australia. The four most prevalent health risk behaviours identified were risky sexual behaviour, alcohol use, illicit drug use, and tobacco use. A variety of intervention programme types were utilised across the nine studies. These consisted of self-administered questionnaires, education sessions, school-based education sessions with counselling, electronic screening with personalised feedback, parent-based intervention strategies and incentive-based strategies.

Most studies yielded mild to moderate success results ($n=7$). The most unsuccessful prevention strategy utilised was the use of incentives as a means of trying to deter adolescents from smoking. The most successful prevention strategy identified was school-based intervention programmes targeting multiple risky behaviours, which are prevalent in the schooling environment, and showed moderate evidence that these interventions effectively promoted physical activity engagement (MacArthur 2018).

Discussion

This scoping review aimed to identify, collate, and summarise the evidence regarding health risk behaviour intervention/prevention programmes amongst youth and adolescents in the context of its influence on behavioural change and sustainability. South Africa's report on adolescent health risk behaviour exposed the severe impact which risky behaviour is having on the youth of South Africa and on the detrimental physical and mental effects of this behaviour. However, few interventions have managed to dissuade risky behaviour engagement. Alarmingly, there is a paucity of evidence regarding the effectiveness of any intervention/prevention programmes published in South Africa in the last decade.

This scoping review provides global insight into the existing prevention/intervention programmes aimed at youth and adolescents, as well as the potential effectiveness of

Table 2 Summary of systematic reviews

Author and study design	Year	Country	Sample size	Age (years) or grade	Health risk behaviour targeted	Type of intervention/behaviour modification	Behaviour modification/intervention effective	Authors' conclusion
Vahedo Z, et al. Systematic review with meta-analysis	2018	Canada	Media literacy $n = 5000$ (15 studies) Risky health behaviour $n = 9177$ (20 studies)	11–19	Multiple	• Treatment/control • Treatment only – post questionnaires • Treatment only – pre/post questionnaires • Treatment and control – pre/post questionnaires • Treatment and control – questionnaire only • Solomon four-group • Randomised crossover – pre/post questionnaires	Moderately effective	Small to medium effect of media literacy interventions on media literacy skills. Media literacy interventions also have a small but positive effect on adolescent attitudes and behavioural intentions towards substances, smoking, and risk")' sexual behaviour
Bo A, et al. Systematic review with meta-analysis	2018	USA	21 studies included with participants ranging from 59 to 3111	10–18	Alcohol use	Parent-based intervention strategies • Intervention vs no treatment • Intervention vs treatment as usual • Intervention vs attention control (psycho-educational)	Good effectiveness with suggestions for improved efficacy	Parent-based interventions appeared to have a larger mean effect size on adolescent drinking intention than on binge drinking. Interventions targeting both general and alcohol-specific strategies had larger average effect sizes than interventions targeting alcohol specific parenting only

the programmes. Programmes that utilised school-based sessions with counselling (McCarty et al. 2019) and electronic screening with personalised feedback (Richardson et al. 2019) showed the most promising results. Generalised parent-based intervention strategies targeting multiple risky behaviours were also shown to have a positive effect compared to targeted health-risk behaviour parenting (Bo et al. 2018).

While the studies mentioned above utilise a rather logical and pragmatic approach, youth in developing countries face unique behavioural influences. A South African study by Visser (2003) identified that primary school children are still susceptible to being positively influenced by well-planned intervention programmes; however, South African youth are faced with alcohol and drug abuse in their own homes and lack the appropriate adult support systems (Visser 2003). Thus, a modification to the pragmatic approach used in developed countries is needed. A more recent study by Pharaoh et al. (2014) identified four aspects that should be considered if programmes were to effectively combat risky

Table 3 Summary of Cochrane reviews

Author and study design	Year	Country	Sample size	Age (years) or grade	Health risk behaviour targeted	Type of intervention/behaviour modification	Behaviour modification/intervention effective	Authors' conclusion
Faggiano F, et a. Cochrane review	2014	Italy	51 studies, $n = 127,146$	12–13	Illicit drug use including marijuana and hard drug use	Experimental intervention: school-based primary prevention interventions (educational approaches and targeting substances) control intervention: usual curricular activities and different school-based intervention	Moderately effective	School-based programmes based on a combination of social competence and social influence approaches show, on average, small but consistent protective effects in preventing drug use, although some outcomes did not show statistical significance. The effects of school-based programmes are small; a recommended option is to include them in more comprehensive strategies for drug prevention to achieve a population level impact

Table 3 (continued)

Author and study design	Year	Country	Sample size	Age (years) or grade	Health risk behaviour targeted	Type of intervention/behaviour modification	Behaviour modification/intervention effective	Authors' conclusion
McArthur G, et al. Cochrane review	2018	United Kingdom	73 studies	8–18 If the intervention was targeted at parents, then the age limit was 25	Multiple behaviours	• Targeted individual level interventions • Universal individual level interventions • Targeted family level interventions • Universal family based interventions • Targeted in-school level interventions • Universal school based interventions	Moderately effective	School-based programmes provided universally without consideration of individual risk are likely to be effective in preventing tobacco use, alcohol use, and physical inactivity (moderate-quality evidence), and may also be beneficial in relation to illicit drug use (low-quality evidence). There is scope to consider adaptation of universal school-based models to particular contexts and implementation more widely
Hefler M, et al. Cochrane review	2018	Australia	Eight studies $n = 7275$	11–14	Smoking	Incentive for smoking cessation: smoke-free class competition	Not effective	Very limited evidence suggests that incentive programmes do not prevent smoking initiation among youth

behaviour, specifically in the South African context: 1) identify the health risk behaviour (HRB) that youth engage in, 2) identify the perceived reasons why youth engage in HRB, 3) identify the places of exposure to HRB, and 4) targeting content (Pharaoh et al. 2014). Therefore, it is postulated that by including the youth in acquiring the relevant content when designing the intervention programmes, the unique environmental circumstances facing youth in South Africa could be mitigated, while programme buy-in and sustainability would be improved (Pharaoh et al. 2014). Incentive strategies to deter risky behaviour engagement proved to be the least effective (Hefler et al. 2017).

It is worth noting that none of the included articles in this scoping review provided details of the utilisation of behavioural theories or overarching frameworks used in the programme's design or how the researchers opted for a specific intervention. Thus, there is a high degree of heterogeneity in this study in the choice of intervention and the methodological approach to the study design.

Limitations

A limited number of databases were accessed for this review. It was the author's intention to strategically select databases that would most likely cover the overall topic of health risk behaviour. However, the inclusion of more databases could have yielded more results. Only articles published in English and articles published in the last decade were included in this review. Time and resource constraints prevented translation of articles, and the authors wanted the latest available data to be included in this review. Only one intervention article included in this review was published in a developing economy country. While this is not a direct limitation of this review, the paucity of published data from developing countries lends itself to these countries adopting strategies that have been created for developed countries and may not be suitable for implementation in a developing country.

Conclusion

School-based intervention programmes with counselling sessions as well as electronic screening with personalised feedback showed promising results for positive behaviour modification of risky behaviour, while incentive-based programmes showed little to no effect. The results of this review once again reiterate the need for strategic and targeted intervention programmes to deter risky behaviour engagement amongst youth and adolescents. A clear link between health risk behaviour engagement and the potential development of non-communicable diseases or trauma should be emphasized. Researchers developing intervention programmes should clearly detail the rationale behind the intervention choice or utilise a standardized framework (e.g., Intervention Mapping) to limit heterogeneity and make intervention studies repeatable. While the fight against health risk behaviour engagement may not be won overnight, the lack of conclusive evidence regarding positive behaviour modification strategies suggests that society may be losing the war.

Authors' contributions KJD is the primary author responsible for the overall conceptualisation, article writing, database searching and data extraction, and has completed this review in partial fulfilment of a PhD degree. IH is a secondary researcher responsible for independent database searching, data extraction, collation, and final article approval. HP is the overall supervisor responsible for the study concept design and approval of the final article submission. All authors have read and approved the final manuscript.

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Data availability The authors declare that the article contains the data to support the study's findings.

Declarations

Ethical approval This article followed all ethical standards for research without direct contact with human or animal subjects. Ethical approval was applied for and approved via the University of KwaZulu Natal Ethics Board (Study approval number: HSSREC/00004179/2022).

Conflict of interests The authors and corresponding affirm that they have no financial or personal ties that could have inappropriately impacted their writing for this article.

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