A Systematic Review on Adolescents' Premarital Sexual Behaviour In Malaysia

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Abstract

Background: Premarital sexual behaviours among adolescents and the associated negative consequences of teenage pregnancy is an increasing public health concerns in Malaysia. Despite the extensive research related to sexual and reproductive health of adolescents, the problems remain reflecting the possible poor understanding of the underlying causes contribute to the problem. This systematic review is aimed at critically evaluating the available evidence on the contributing factors related to premarital sexual behaviours among adolescents in Malaysia.

Methods: Five databases; Scopus, MEDLINE/ PubMed, CINAHL, Science Direct and Google Scholar were utilized to systematically searched related articles up to July 2018. Searching involved local quantitative, qualitative and mixed methods studies with premarital sexual behaviours among adolescents in Malaysia being the primary outcome. Two reviewers independently extracted data and assessed study risks of bias.

Results: We identified 1762 articles, of which only nine articles were included, which was dominated by six cross sectional studies. A total of 41 939 adolescents aged between 12 to 19 years old were included in this review. The prevalence of premarital sexual behaviours among adolescents was ranging between 2.9% to 8.3%, reported by history of ever had sex. Religiosity, attitude towards sexual urge (pornography and masturbation), high-risk behaviours (bullying, smoking and substance intake – alcohol and drugs) and parents-peers influence were main contributing factors identified to associate with premarital sexual behaviours.

Conclusion: Negative attitude towards sexual urge and involvement in high risk behaviours put adolescents at higher risk of premarital sexual behaviour, while religious beliefs and reciprocal relationship between parents and peers influence may act as protective factors. However, more qualitative, and mixed methods studies needed to get in-depth understanding on the relationship between these factors and premarital sexual behaviours.

Background

Adolescence is the phase of life between childhood and adulthood, from ages 10 to 19, characterised by rapid physical, cognitive and psychosocial growth, indicating an important time for laying the foundations of good health [1]. They make up about 20% of the world's population [2] and is considered vulnerable population to engaging in poor and risky sexual behaviours, such as unprotected sexual intercourse and having multiple partners, which can result in adverse health outcomes, including unintended pregnancy and HIV or other sexually transmitted diseases [3]. Sexual activity among adolescents varies markedly by gender and region with more girls reported sexually active in sub-Saharan Africa, Asia, and central Asia compared to in Latin America and Caribbean, which were dominated by boys [4].

The unsafe and risky sexual practices put them at risk of complicated pregnancies and childbirth, which are listed as one of the leading causes of death among adolescent girls aged 15 to 19 years [5]. Teenage pregnancy has been linked with poor outcomes particularly related to multiple maternal and children's health risks. A report by WHO in 2011 demonstrated that 15.9 million infants were born to adolescent mothers among whom at higher risk of dying at their first two years of life, with approximately 15% of total number of maternal mortality were among young women worldwide [6].

In Malaysia, the prevalence of adolescents who ever had sex had increased steadily throughout the years with reducing age pattern observed. In 2017, 7.3% of secondary school aged adolescents aged 13 to 17 years old

reported to have experienced a sexual event, compared to only 1% in 1995 [7]. Significant numbers of quantitative studies have been published locally related to risky sexual behaviours among adolescents and its negative sequelae with very limited qualitative or mixed methods studies exploring the same problem. Despite the intensified efforts to educate the community as a whole and adolescents particularly, the public health concern related to Malaysian adolescents' sexual behaviours remained. By reviewing quantitative and qualitative studies, this article aims to identify the contributing factors of premarital sexual behaviours among the Malaysian adolescents.

Methods

This review was conducted and reported in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines [37].

Eligibility criteria

We included observational, qualitative, and mixed methods studies that identified, predict, explored and explained factors associated with premarital sexual behaviours among adolescents in Malaysia. We excluded experimental studies, non-English language studies, editorial, proceedings, descriptive studies, protocol, and studies among non-Malaysians living in Malaysia and articles published before the year of 2008.

Data sources and search strategy

We systematically searched for relevant articles published in Scopus, MEDLINE/ PubMed, CINAHL, Science Direct and Google Scholar up to July 2018. The search was limited to 10 years, from 2008 until 2018. Combination of keywords were used: Malaysia AND adolescent OR youth OR teen* OR teenager* AND "premarital sex" OR "premarital sexual activity" OR "premarital sexual intercourse" OR "sex before marriage" AND behaviour OR behaviour in the abstract, title or keywords fields.

Study selection

A pair of authors independently assessed the titles and abstracts of a defined set of articles based on the keywords used. Each study was recorded as include, exclude or unclear. The full articles were retrieved to further assess the include and unclear categorized articles. Eligible studies were identified based on the pre-determined inclusion criteria. Discussion between authors were conducted to identify discrepancies in the assessment in order to achieve consensus on the final articles should be included in the review.

Data extraction, data analysis and quality assessment

The data from the selected studies were extracted according to prevalence of adolescents' premarital sexual activities, and the contributing factors associated with premarital sexual behaviours. Data extraction from all potential studies was documented in Table 1 (See Table 1). The table included information related to the study design, study characteristics (year of study, study objective and sample size), characteristics of study population (age and setting) and the key findings of individual articles.

Table 1
Description of studies included for the review and their key findings.

Authors	Year	Study location	Study objective	Study population	Key Findings	
					Premarital sexual behaviour	Factors contributing
Quantitative studies						
Cross sectional study design						
Ahmadian et al.	2014	10 states in Peninsular Malaysia	To determine risk and protective factors of premarital sexual behaviour among rural female adolescents in Peninsular Malaysia.	770 female students in secondary schools, aged 13 to 17	Prevalence of pre-marital sex, 3.2%	Predictors of premarital sexual intercourse; • Peer-sexual disorder (OR 5.85, 95% CI; 2.06–16.58) • Attitude towards sexual health (OR 4.03, 95% CI; 1.35–12.03) • Midnight activities (OR 8.75, 95% CI; 3.11–24.62) • Negative self-evaluation (OR 6.49, 95% CI: 1.45–28.99)

Authors	Year	Study location	Study objective	Study population	Key Findings	
					Premarital sexual behaviour	Factors contributing
Abdul Manaf et al.	2014	Selangor	To identify prevalence of premarital sex among youth undergoing national skill training program and to evaluate the predictors.	1328 youth trainee in PLKN institutions aged 18	Prevalence of pre-marital sex, 4.6%	<p>Significant predictors;</p> <ul style="list-style-type: none"> • Other races (AOR 2.8, 95% CI; 1.1–7.1) • Religion (AOR 11.7, 95% CI; 1.3–107.1) • Have lover (AOR 5.1, 95%CI; 2.6–9.8) • Have read or watched pornography (AOR 4.1, 95% CI; 1.8–9.3) • Masturbate (AOR 2.7, 95% CI; 1.3–5.6) • Bully (AOR 6.1, 95% CI; 1.8–20.6)
Ahmad et al.	2014	Malaysia	To determine the national prevalence of sexual activity among secondary school adolescents and to examine selected risk and protective factors associated with sexual activity.	23 645 secondary school students, aged 12 to 17	Prevalence of ever-had sex, 8.3%.	<p>Predictors for ever-had sex includes;</p> <ul style="list-style-type: none"> • Ever-used drugs (AOR 7.71, 95% CI; 6.51–9.13) • Ever smoked (AOR 1.83, 95% CI; 1.62–2.07) • Ever-consumed alcohol (AOR 1.33, 95% CI; 1.15–

Authors	Year	Study location	Study objective	Study population	Key Findings	
					Premarital sexual behaviour	Factors contributing
						2.53) • Indians (AOR 1.32, 95% CI; 1.01–1.65) Protective factors include; • Parental connectedness (AOR 0.88, 95% CI; 0.78–0.99) • Supportive peers (AOR 0.77, 95% CI; 0.69–0.86) • Parental bonding (AOR 0.72, 95% CI; 0.65–0.81) • Having a close friend (AOR 0.63, 95% CI; 0.50–0.81)

Authors	Year	Study location	Study objective	Study population	Key Findings	
					Premarital sexual behaviour	Factors contributing
Awaluddin et al.	2015	Secondary data, Malaysia	To determine the prevalence of sexual activity in older adolescents and to examine the most common risk factors associated with it.	11676 adolescents, aged 18 to 19	Prevalence of premarital sexual intercourse, 6.4%	<p>Significant predictors for sexual activity;</p> <ul style="list-style-type: none"> • Pornographic viewing (AOR 2.55, 95% CI; 2.01 – 3.22), • Risky behaviour (AOR 2.62, 95% CI; 2.11 – 3.25) • Anti-social behaviour (AOR 2.44, 95% CI; 2.06 – 2.90) • Female gender (AOR 2.24, 95% CI; 1.76 – 2.85) • History of abuse (AOR 1.81, 95% CI; 1.46 – 2.24) • Low religiosity (AOR 1.71, 95% CI; 1.30 – 2.26) • Masturbation (AOR 1.34, 95% CI; 1.07 – 1.68)

Authors	Year	Study location	Study objective	Study population	Key Findings	
					Premarital sexual behaviour	Factors contributing
Cheah et al.	2016	Peninsular Malaysia	To examine the effects of demographic and lifestyle factors on the likelihood of engaging in sexual intercourse.	2991 adolescents, aged 13 to 17	Prevalence of ever had sex, 4.08%	<p>Protective factors include;</p> <ul style="list-style-type: none"> • Self-rate their academic performance as fair (OR 0.48, 95% CI; 0.231–1.001) • Parents are married (OR 0.41, 95% CI; 0.215–0.789) <p>Risk factors includes;</p> <ul style="list-style-type: none"> • Aged above 16 years (OR 2.61, 95% CI; 1.593–4.282) • Alcohol drinkers (OR 2.510, 95% CI; 1.306–4.825) • Cigarette smokers (OR 5.26, 95% CI; 3.329–8.317)

Authors	Year	Study location	Study objective	Study population	Key Findings	
					Premarital sexual behaviour	Factors contributing
Nawi et al.	2017	Selangor	To determine the prevalence of sexual practices among school-going adolescents and to identify predicting factors associated with these practices.	306 secondary school students, aged 16	Prevalence of pre-marital sex, 2.9%.	<p>Predictive factors associated with sexual practices;</p> <ul style="list-style-type: none"> • Male (AOR 2.7, 95% CI; 1.4–2.5) • Truancy (AOR 2.3, 95% CI; 1.3–4.2) • Bully (AOR 3.5, 95% CI; 1.7–7.3) • Hanging out (AOR 2.8, 95%; 1.4–5.6) • Staying out late (AOR 3.2, 95% CI; 1.5–6.8) • Conflict with family (AOR 4.1, 95% CI; 1.9–8.9)
<i>Qualitative studies</i>						

Authors	Year	Study location	Study objective	Study population	Key Findings	
					Premarital sexual behaviour	Factors contributing
Wong LP.	2012	Selangor & Kuala Lumpur	To investigate sexual attitudes and behaviours, and contraceptive use among Malaysian youth.	83 female students in secondary schools, aged 15 to 19	Prevalence of ever had sex, 30.1%	Categories of factors influencing sexual attitudes and behaviours: <ul style="list-style-type: none"> • Ethnic group and religion • Level of religiosity • Peer pressure and norms • Parental monitoring
Nik Farid et al.	2015	Kuala Lumpur & Selangor	To explore the factors associated with early sexual initiation and how these factors are related to lifestyle, values and the home environment among a sample of high-risk Malaysian adolescents.	29 inmates aged 13 to 19	All had experienced of sexual act below age of 18	Distal factors: <ul style="list-style-type: none"> • Poor religiosity • Domestic violence • Poor interest in school • Loitering with friends Proximal factors: <ul style="list-style-type: none"> • Curiosity • Stress reliever • Partner acquiescence • Peer pressure
<i>Mixed methods studies</i>						

Authors	Year	Study location	Study objective	Study population	Key Findings	
					Premarital sexual behaviour	Factors contributing
Nik Farid et al.	2013	Welfare & Rehab institutions in Peninsular Malaysia	To investigate the determinants of sexual intercourse initiation among incarcerated adolescents aged 12–19 years in Malaysia.	1082 inmates aged 12 to 19 for quantitative component. 29 inmates aged 14 to 19 for qualitative component.	Prevalence of ever had sex, 62.3%	<p>Factors significantly associated with having experienced sexual intercourse:</p> <ul style="list-style-type: none"> • History of sexual abuse (OR 5.41; 95% CI; 3.52–8.32) • Attitudes toward premarital sex (OR 4.34; 95% CI; 2.17–8.70) • Viewing of pornography (OR 2.84; 95% CI; 1.65–4.89) • Previous alcohol consumption (OR 1.80; 95% CI; 1.10–2.94) • Illicit drug (OR 1.85; 95% CI; 1.07–3.22) <p>Themes for initiation of sexual intercourse;</p> <ul style="list-style-type: none"> • Partner influence • Inability to control sex drive • Family issues • Perception of sex as an expression of love

The Crowe Critical Appraisal Tool (CCAT) was utilized in the quality assessment as the tool covered methodological assessment of both quantitative and qualitative studies [8]. The CCAT examined the studies based on eight criteria which included preliminaries, introduction, design, sampling, data collection, ethical matters, result, discussion, and conclusion. Total score was then converted into percentage whereby the following categories were assigned to allow for comparison; poor quality ($\leq 50\%$), acceptable quality (51–74%), high quality ($\geq 75\%$) [9].

Results

Search results.

We identified 1762 articles using the previously stated databases. After excluding 948 duplicated studies, a total of 814 articles were screened based on titles and abstracts, leading to further 765 articles excluded due to study location other than Malaysia, irrelevant topics and non-English written articles. Forty-nine full text articles were screened, of which 40 articles were further excluded for the following reasons: irrelevant outcomes (22), experimental studies (7), study population aged more than 19 years old (10) and articles with uncertain statistical analysis (1). A total of nine studies were included in this review [10–18]. Three studies were included in the qualitative analysis compared to seven studies in the quantitative analysis, with quantitative and qualitative findings of the mixed methods articles were separated accordingly for the purpose of this review. Figure 1 shows the PRISMA flowchart.

Characteristics of included studies.

A total of 41 939 adolescents aged between 12 to 19 years old were included in this review. Seven studies were conducted at various states in the peninsular of Malaysia, one article was published based on the National Health Morbidity Survey 2012 data and the other article was published based on a national health screening data among adolescents conducted in 2010. A total of six studies conducted among secondary school adolescents [10, 12, 14, 15, 16] and another three were among institutionalized adolescents such as National Service Training Program (PLKN) and rehabilitation homes [11, 18]. Among all, two studies recruited only female participants [10, 16].

Quality assessment.

Quality assessment for each study was conducted using Crowe Critical Analysis Tool; an established and validated tool used in assessing quality of observational studies [8]. A total of seven studies were rated as of high-quality with percentage scores ranged between 75 to 85% and the remaining two were rated as of acceptable quality (total score ranged between 51–74%) [9] as tabulated in Table 2.

Table 2
Crowe Critical Analysis Tool Result

Category	Wong, L., P. et al (2012)	Nik Farid, N., D., et al (2013)	Ahmadian et al., (2014)	Abdul Manaf, et al (2014)	Ahmad et al (2014)	Awaludin et al (2015)	Nik Farid et al (2015)	Cheah (2016)	Nawi et al (2017)
Preliminaries (/5)	5	5	5	4	4	4	5	5	5
Introduction (/5)	4	4	4	3	5	5	4	4	4
Design (/5)	4	5	5	3	5	4	3	4	5
Sampling (/5)	5	4	4	3	4	3	4	3	4
Data collection (/5)	4	4	4	3	4	4	4	3	4
Ethical matters (/5)	5	5	5	3	5	4	4	3	4
Results (/5)	4	4	4	4	4	3	3	3	4
Discussion (/5)	5	5	5	3	5	3	4	2	4
Total score (/40)	36	36	36	26	36	30	31	27	34
Percentage (%)	90	90	90	65	90	75	77.5	67.5	85

Prevalence of premarital sexual behaviours among Malaysian adolescents.

Prevalence of premarital sexual behaviours among the Malaysia adolescents as reported by history of ever had sex, ranged from 2.9–8.3% among secondary school adolescents [10, 12, 14, 15, 16] and as high as 62.3% among those that were institutionalised [18]. Two studies were conducted in Selangor which recorded prevalence of 4.6% in 2014 [11] and 2.9% in 2017 [15]. Other studies did not specifically mention their study location but were being generalized to either peninsular or east Malaysia. On average, the mean age of was 14 years old [10, 12, 18].

Contributing factors of premarital sexual behaviours among Malaysian adolescents.

All quantitative studies included in this review used questionnaires as their study aimed to measure the association between contributing factors and adolescents' premarital sexual behaviours, presented as odds ratio (OR) or adjusted odds ratio (AOR). We have specifically categorized the factors identified in this review according to the constructs of the Social Cognitive Theory, personal, behaviour and environmental factors.

a. Personal factors

All the studies included reported mixed findings related to the role of personal factors predicting premarital sexual behaviours among adolescents. Religiosity was mentioned in two of the cross-sectional studies and both qualitative studies [11, 13, 16, 17], with low religiosity was reported to associated with higher risk of premarital

sexual behaviours among adolescents. Abdul Manaf et al. [11] reported the highest odds of 11.7 likelihood towards sexual behavior among adolescent due to religiosity (AOR 11.7, 95% CI: 1.3-107.1).

b. Behaviour factors

The review found that most of the articles emphasized the role of behavioural factors predicting premarital sexual behaviours, particularly attitude and involvement in high-risk behaviours. Attitude towards sexual urge, which was also reported by the act of watching and reading pornography and masturbation significantly predict sexual behavior in three of the cross-sectional studies and also in the mixed methods study [10, 11, 13, 18]. Meanwhile, high-risk behaviours such as bullying, smoking and substance intake (alcohol and drugs) were also significantly predicted sexual behaviours among Malaysian adolescents in five of the cross-sectional studies [11, 12, 13, 14, 15]. History of ever used drug predicted the highest likelihood of 7.71 odds towards sexual behaviours among adolescents [12], compared to 6.1 odds by bullying [11].

c. Environmental factors

Meanwhile, family and peers related factors were identified under environmental factors that were associated with sexual behaviours among adolescents. The influence of family, particularly parental role on involvement of adolescents in sexual behaviours were reported in three of the cross-sectional studies [12, 14, 15], one qualitative study [16] and the qualitative findings of the mixed methods study [18]. Having both parents who are still married served as the strongest protective factor (OR 0.41, 95% CI: 0.215–0.789) among Malaysian adolescents, with 59% less likelihood to be involved in sexual behaviours [14]. Meanwhile, the role of peers in influencing sexual behaviours among adolescents were more prominent in the qualitative findings in both qualitative studies [16, 17] and the mixed methods study [18]. Only two of the cross-sectional studies reported the role of peer in influencing sexual behaviours among Malaysian adolescents [10, 12].

Discussion

Prevalence of premarital sexual behaviours among adolescent in Malaysia.

The review found the prevalence of pre-marital sexual behaviour among Malaysian adolescents ranged between 2.9 and 8.3%. The review finding was higher in comparison to finding by national health survey in 1996 which reported prevalence of ever had sex among adolescents at 1.8% but the prevalence range were in keeping with subsequent series of national surveys on adolescents' at 8.3% in 2012 [19] and 7.3% in 2017 [7]. The poor response rate and the lack of representativeness in the selection of study population in the study by Nawi et al. [15] may have contributed to the low prevalence of premarital sexual behaviour among adolescents. Additionally, the use of self-reported and non-anonymous questionnaires among seven studies may have led to under-reporting of the prevalence of pre-marital sex among Malaysian adolescents.

Nevertheless, the reported prevalence of pre-marital sex behaviour among Malaysian adolescents in these studies were lower as compared to the neighbouring countries, including 11.2% in Brunei [20] and 11.0% in Thailand [21], but higher as compared to Cambodia (8%) and Vietnam (3%) [22]. Possible causes for the variation could be due to characteristics of the respondents, tools used to collect the data and locality of study.

Contributing factors associated with adolescents' premarital sexual behaviours.

The role of religion was the only personal factor consistently reported in few of the articles reviewed, particularly in the qualitative results. Having a more conservative religious connection reported to delay sexual debut [23]. A review done in the United States which analysed evidence of adolescents' religiosity causal relationship with their sexual behaviours noted all 10 longitudinal studies conducted from 1980 to 2000 reported that religious adolescents and those who were actively attending religious activities were unlikely to be involved in sexual activity [23], reflecting the important role of religious beliefs in shaping adolescents' sexual behaviour.

Meanwhile, attitude towards sexual urge and involvement in high-risk behaviours were important factors contributed towards sexual behaviours among Malaysian adolescents, identified from this review. Masturbation and reading or watching pornography were two manifestations of negative attitude towards sexual urge reported to predict sexual behaviours among adolescents in this review. Masturbation or solitary sex is defined as an act of exciting one's sexual organs by rubbing, stroking, pressing, folding or other forms of manipulation to reach orgasm [24]. According to Herbenick et al. [25], the physiological changes and emergence of sexual urges among adolescents may be manifested in the form of masturbation or other activities, ranging from hugging and kissing to vaginal intercourse. Association between masturbation and pornography watching has been reported in previous studies as well. In a case study of undergraduate students in Bangladesh found that, the prevalence of masturbation among the students was 33% and was significantly higher among male students [26]. The study also reported, students who watched pornography at least once a week (OR: 161.43, 95% CI = 38.64-674.39) or once a month (OR: 112.30, 95% CI = 22.80-553.22) were more likely to masturbate. Pornography consumption was also reported to positively associated with extramarital sex.

Similarly, risky behaviours such as cigarette smoking, intake of drugs and alcohol were also found as main contributors towards adolescents' premarital sexual behaviour. These factors were also consistently reported as significant predictors of premarital sexual behaviour in several other Asian countries such as India, China, Indonesia, Thailand and Vietnam [22]. A recent local study also reported that history of ever used drugs (AOR = 10.201) and ever smoked (AOR = 1.628) were significantly associated with sexual activity of adolescents [27]. According to Hops et al. [28], adolescents who abuse substances are more likely to engage in health-risking sexual behaviour (HRSB) and are at particularly high risk for HIV/AIDS. Evidence showed that as many as 22.1% of adolescents engaged in substance use during their most recent sexual encounter [29]. Adolescents who regularly abuse substances are more likely to become sexually active at an earlier age [30], have more sexual partners [31], and are more likely to have unprotected sex [32]. A meta-analysis on risky sexual behaviour and substance use among adolescents reported the role of moderators such as sex, ethnicity and age on the relationship between drug use and risky sexual behaviour [33].

On the other hand, parents and peers were found to be important protective factors towards sexual behaviours among Malaysian adolescents. Wang et al., [3] suggested that there are reciprocal relationships between parenting, peer influence and adolescent sexual risk involvement. Parents and peers are two major potential influences on risky and protective behaviours among adolescents by creating a social context for behavioural development, act as role models, and provide opportunity and reinforcement for risk and protective behaviours [3]. Interestingly, literatures have also reported the interplay between parental and peer influences in order to better understand risky behaviours among adolescents. Parental monitoring may buffer negative peer influence on adolescent risk involvement [34], influence the type of peers with whom adolescents associate [35] and decrease the likelihood that adolescents will affiliate with deviant peer groups [36]. To effectively reduce sexual risks among adolescents, peers and parents should be included in any related intervention [3].

Conclusion

Premarital sexual involvement among Malaysian adolescents is increasing and is affecting adolescents of younger age groups. Religious beliefs, attitude towards sexual urge (masturbation and pornography watching), high-risk behaviours (smoking and substance intake), and parent-peer influences were identified as contributing factors towards adolescents' sexual behaviours. The inclusion of quantitative and qualitative findings contributes to the strength for this review in order to better understand the contributing factors of Malaysian adolescents' sexual behaviours. However, the scarcity of qualitative research included in this review may also limit the overall interpretation and must be delineated with caution. Future studies should consider more qualitative exploration and mixed methods approach with incorporation of the reciprocal role of parents and peers in intervention studies.

Abbreviations

SRH	Sexual and reproductive health
HIV	Human immunodeficiency virus
AIDS	Acquired immunodeficiency syndrome
PRISMA	Preferred Reporting Items for Systematic Reviews and Meta-Analyses
CCAT	Crowe Critical Appraisal Tool
PLKN	National Service Training Program
OR	Odds ratio
AOR	Adjusted odds ratio
HRSB	Health-risking sexual behaviour

Declarations

7.1 Ethics approval and consent to participate

Not applicable

7.2 Consent for publication

Not applicable

7.3 Availability of data and materials

All data generated or analysed during this study are included in this published article [and its supplementary information files]

7.4 Competing interests

The authors declare that they have no competing interests

7.5 Funding

Not applicable

7.6 Authors' contributions

All Authors read and approved the manuscript

MHS initiated the idea and performed full editing of the review

NRI & FJ performed information gathering, preparation and editing of the review and was a major contributor in writing the manuscript

NAMZ and NA conducted review and editing of the manuscript

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7.8 Authors' information (optional)

Nil

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Figures

Figure 1

Flow diagram of the selection process used to identify studies for inclusion in this review based on PRISMA Statement