

European Journal of
Health Sciences
(EJHS)




**Strategies Used by Adolescents to Curb Adolescent
Pregnancy and Abortion: An Integrative Review**

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Strategies Used by Adolescents to Curb Adolescent Pregnancy and Abortion: An Integrative Review

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Article history

Submitted 06.05.2024 Revised Version Received 10.06.2024 Accepted 12.07.2024

Abstract

Purpose: In spite growing recent attention on adolescent sexual and reproductive health (ASRH), there is persistently high prevalence of adolescent pregnancy and abortion (ADOPA) & related consequences. Thus, this integrative literature review on “Strategies used by Adolescents to curb adolescent pregnancy and abortion” from 2000-2020. The general objective was to assess existing strategies used by Adolescents (ADOs) to curb ADOPA with the purpose of creating a better understanding it.

Materials and Methods: An integrative review was carried out using the theoretical model Toronto and Remington (2020). The review question was formulated. 75 included studies sourced from 9 data bases & others were systematically selected, reviewed guided by PRISMA, & their quality appraised by best fit standard tools. An inductive thematic analysis with mixed-methods synthesis was then done.

Findings: As key results, 65.3% (49) of studies were primary empirical & 34.7% (26) systematic review. Based on review questions, two main strategies were identified: research & outreach programs. Research implementation strategic component (IMSTRATCOM) was mainly Sexual and reproductive education (SRE). Six major strategies of outreach programs were identified constituting 35 specific programs. Most were complementary & multifaceted in their IMSTRATCOM. They include with components (in bracket) Sex & STIs/HIV Education (SRE); Protocols for Health Clinic Appointments & Supportive Activities (Curriculum development (CUD), SRE, Case management, peer educator training, employment & leadership, Collaboration, increasing access to RH services); Service Learning (CUD, SRE, peer monitoring, social worker supervision, Field work); Healing & Restoration (SRE, Coaching & resource referral, group therapy & Parent participation); Collaborative approach (CSE, community support & engagement, Increasing access to RH services); and Child Development & Aid/Motivation (cash transfers, school uniforms & contraception provision, paid employment, medical care, services to parents & community). Limitations of research & outreach programs were similar & include methodology problems; no stratification of ADOs in intervention & results; mostly late ADOs & females involved. Strategies exist that can successfully curb ADOPA. However, variability in study populations, interventions & outcomes, & paucity of studies for comparison renders difficult reliable conclusion on most effective strategy.

Implications to Theory, Practice and Policy: High-quality research with their evaluation considering multicomponent be done; and permanent institutions for support of ASRH projects established.

Keywords: *Curbing Strategy, Adolescent, Adolescent Pregnancy, Adolescent Abortion, Integrative Review*

JEL Codes: I11

Resume

But: Malgré l'attention croissante portée récemment à la santé sexuelle et reproductive des adolescents (SSRA), la prévalence de la grossesse et de l'avortement chez les adolescentes (GADO) et les conséquences qui en découlent restent élevées. Ainsi cette revue de littérature intégrative sur les "stratégies utilisées par les adolescents pour réduire les grossesses et les avortements chez les adolescentes" entre 2000 et 2020. L'objectif général était d'évaluer les stratégies existantes utilisées par les adolescents (ADOs) pour réduire le nombre de grossesses et d'avortements chez les adolescentes, afin de mieux les comprendre.

Methodologie: Une review intégrative a été réalisé sur le modèle conceptuel de review intégrative de Toronto et Remington (2020). La question de la review a été formulée. 75 études incluses provenant de 9 bases de données et d'autres ont été systématiquement sélectionnées, conformément à PRISMA, & leur qualité a été évaluée à l'aide des outils standard les mieux adapté. Une analyse thématique inductive avec une synthèse des méthodes mixtes a ensuite été réalisée.

Resultats: Comme résultats clés, 75 études ont été utilisées, 65,3 % (49) étaient empiriques primaires et 34,7 % (26) des revues systématiques. Sur la base des questions de la revue, deux stratégies principales ont été identifiées: la recherche et les programmes de stratégie avancé. La composante stratégique d'implémentation de la recherche (CSI) était principalement l'éducation sexuelle et reproductive (ESR). Six grandes stratégies des programmes de stratégie avancé ont été identifiées, constituant 35 programmes spécifiques. La plupart étaient complémentaires et à multiples facettes dans leur CSI. Ils comprennent (CSI entre parenthèses) : éducation sexuelle (ES) et aux IST/VIH ; protocoles pour les rendez-vous dans les cliniques de santé et activités de soutien (développement du programme (DP), ESR, soins médicaux, formation des pairs éducateurs, emploi et leadership) ; apprentissage par le service (DP, ESR, suivi par les pairs, supervision par un travailleur social, travail du terrain) ; Guérison et restauration (ESR, coaching et orientation, thérapie de groupe); approche collaborative (CSE, engagement communautaire, services SR); et développement et aide/motivation de l'enfant (transferts d'argent, uniformes scolaires, contraception, emploi rémunéré, soins médicaux, services aux parents et communauté). Les limites de la recherche et des programmes de sensibilisation étaient similaires et comprennent problèmes méthodologiques, l'absence de stratification des ADOs dans l'intervention et les résultats, les ADOs tardifs et femmes impliqués. Il existe de multiples stratégies susceptibles d'enrayer la GADO. Cependant, la variabilité des populations étudiées, des interventions et résultats, la rareté des études pour comparaison rendent difficile une conclusion fiable sur la stratégie la plus efficace.

Recommandations: Des recherches de haute qualité, leur évaluations et l'évaluation tient compte des composantes multiples, doivent être menées et des institutions permanentes de soutien aux projets de SSRA doivent être mises en place.

Mots clés: *Stratégie de réduction, Grossesse chez les adolescents, Avortement chez les adolescents, Review Intégrative.*

JEL: I11.

1.0 INTRODUCTION

Worldwide, 1 in 5 people are adolescents (ADOs) aged 10-19 years old (UNICEF, 2022). Due to the physiological and psychological changes that take place, adolescents are interested in exploring the world around them & become sexually active but are less likely to use contraception than adults, even in places where contraceptives are widely available (UNFPA, 2015). This puts them at a risk of sexually transmitted infection (STIs) & pregnancy, as some young people may often lack adequate knowledge of safe sex (Boislard, 2016). The International Initiative for Impact Evaluation (3ie) (2016) purports that programming that addresses SRH has the potential to greatly improve not only adolescents' SRH, but also their overall health and their ability to reach their full potential. This can range from clinical interventions such as STI treatment, health systems strengthening, community engagement approaches aimed at changing norms around gender, marriage, and sexual health. Worldwide ADO pregnancy and abortion are highly plagued with high prevalence, morbidity, and mortality. According to WHO (2018), 21 million girls aged 15 -19 years, 2.5 million under 16 years and 1 million under 15 year (Ramraj et al, 2018) give birth each year globally (11%). 95% of these births occurring in low and middle-income countries (WHO, 2016) with the largest occurring in Eastern Asia and western Africa (Every Woman every Child, 2015; UNICEF, 2013).

Worldwide, roughly 121 million unintended pregnancies occur each year with 61% ending in abortion with a total of 73 million abortions occurring every year (Gutmacher Institute; Bearak J et al, 2020). An estimated 5.6 million abortions occur each year among adolescents among which 3.9 million are unsafe: contributing to maternal morbi-mortality and lasting health problems (Darroch et al, 2016). Furthermore, risk of death associated with pregnancy about 1/3 higher among 15-19-year-old than 20-24-year-old (Nove et al, 2012). Moreover, Adolescent pregnancy and abortion are associated with grave complications to both mother and child with sometimes entire life-time health and socio-economic burden. Complications of ADO pregnancy and abortion are a leading cause of the global burden of poor maternal morbidity & the 2nd cause of death among girls aged 15-19 years; with this rate being 2.5 times higher in girls <15 years (WHO, 2018; Darroch et al, 2016). Associated to these complications significant social costs including financial one; borne by the teenagers themselves, by society, and perhaps most poignantly by the children of teenage mothers, who start out life at serious disadvantage (Manlove et al, 2002). Most pregnant ADO girls' potential remain unfulfilled, and their basic human rights denied (3ie, 2016).

In addition, a guideline was published on ASRH in developing countries, with the goal of improving adolescent morbidity and mortality by reducing the chances of early pregnancy and its associated negative consequences. Two main objectives were set including identify effective interventions to prevent early pregnancy and providing an analytical framework for policymakers and program managers to use when selecting evidence-based interventions with contextualisation of them. (WHO & UNFPA, 2012; WHO et al, 2011). No contextual specificities were however given. Moreover, the United Nations Population Information Network (Popin) et al (2006) stipulate that the SRH care of young people are usually limited due to them being overlooked or viewed from cultural perspectives. The authors added that vulnerability of the young to SRH problems is mostly due to lack of information and access to services.

In Africa and more specifically sub-Saharan Africa, risky adolescent sexual behaviour is of concern where the prevalence of adolescent pregnancy, unsafe abortion and HIV remain exceptionally high (Isaksen et al, 2020, Sedgh et al, 2015). Compounding the situation, are

restrictive abortion laws, with some cultural norms condoning with early marriages and conflicting with health values, knowledge gaps and misconceptions regarding contraception and health worker bias or unwillingness (WHO, 2011). These laws most often appear controversial or paradoxical as sometimes permission is allowed for adolescent marriage in specific contexts; perpetrators of criminal abortion go unpunished with the criminal abortions even done within public settings by public health personnel with state awareness of the illegality of the context of it being done. Moreover, clandestine abortion services offered by lay abortionists, trained midwives, and so-called native doctors, unknown to the public health service and self-performed abortions are becoming common; this especially when performed early, makes difficult to determine the true prevalence of adolescent pregnancy and abortion (Sherris et al, 2005, Ngowa et al, 2015). Abortifacients like misoprostol tablets are poorly restricted in many African countries (ibid). Cameroon's case seems exceptional as 1 in 4 (24%) ADOs of age 15-19 are already mothers or are pregnant with their first child, with childbearing ranging from 6% in Douala to 44% in East region (NIS & ICF, 2020). 84% of married & 50% of unmarried, sexually active ADO girls are not on any contraceptive method (INS & ICF, 2017). Even the very few health facilities offering ASRH services are plagued personnel negative attitudes, incompetence & conflicting attitudes & values to services needed.

Given the above facts and with the continuous and persistent rise in ADO pregnancy and abortion rates and unsafe abortion and their associated consequences, indicative of failure in primary prevention efforts, the researcher had to question curbing efforts of ADO pregnancy. Thus, the take-off question "what are the strategies used by adolescents to curb Adolescent pregnancy and abortion?" and this integrative review on the strategies used by Adolescents curb adolescent pregnancy and abortion. Unveiling this information & its judicial use is strongly believed will have great significance to parents, adolescents, policymakers, program planners, & advocates as would curb the incidence of unintended pregnancies, abortion and especially unsafe abortions, & consequently maternal and child morbi-mortality, increase in the number of healthy women, healthy children & healthy economy. This work was modelled by the integrative review conceptual framework of Toronto and Remington (2020). Thus, review made 6 stages integrated in 4 chapters: chapter one-introduction, chapter two-methodology, chapter three-results and chapter four-discussion, conclusion, and recommendations.

Problem Statement

Adolescent pregnancy and unsafe abortion in spite their serious public health and social concerns and highly neglected worldwide. Worldwide, prevalence of ADOPREG, morbidity and mortality & related complications are high with 21M girls aged 15 -19 giving birth yearly, 95% of which occur in LMIC & mostly in West Africa. Complications of ADOPA are most responsible for global burden of poor maternal morbidity & the 2nd cause mortality among girls 15–19 years (2018). Compounding the situation, are restrictive abortion laws, cultural norms condoning with early marriages and conflicting with health values, knowledge gaps and misconceptions regarding contraception and health worker bias or unwillingness (WHO, 2011). Despite the influence of pre-adult factors such as family context on ASRH attitudes & behaviours and which at formed before age 12 (Pacheco & Kreitzer, 2016; 3ie, 2016), parents have given child education an ancillary role in preference for work & career pursuits & still consider communication on ASRH a taboo (Yibrehu and Mbwele; 2020, Atanga et al, 2015).

With the rise in moral decadence & violence especially in schools, most teachers & counsellors seems for their safety's sake, now reticent getting personally involved with ADOs. Most strategies by political stakeholders especially foreign stakeholders are mostly guidelines or

short-term programs which even though established based on foreign & high-income context and have not been scientifically scrutinised for their adaptation to the African context, are being used by Africa who has the highest rates of ADOPA. Key partners including Adolescents, parents and men particularly, are hardly actively involved (PLAN International & EVIHDAF, 2019; MINPH et al, 2015). Most ADO strategies to curb ADO pregnancy and abortion are research, insufficient, institution-based & sometimes contradictory in results. Persistent rise in ADOPA rates and their associated consequences, coupled with paucity of integrative review on ADOPA justifies this integrative review.

Purpose of the Integrative Review

The purpose of this review is to create a better understanding of the strategies used to curb adolescent pregnancy and abortion, through critical appraisal, synthesis, determination, and communication of current empirical and theoretical strategies used to curb ADO pregnancy & abortion, thus give an informed direction for future this doctoral research & amelioration of practice.

Identification of Variables

Independent variable: adolescent strategies to curb adolescent pregnancy and abortion.

Dependent Variable: incidence of adolescent pregnancy and abortion

Extraneous variable: wide age range of age of adolescent study population and other curbing strategies.

Integrative Review Questions

General Integrative Review Question

What are the existing Adolescent strategies used to curb adolescent pregnancy and abortion?

Specific Integrative Review Questions

- What are the strategies used by Adolescents to curb adolescent pregnancy and abortion?
- What are the components of the strategies used by adolescents to curb adolescent pregnancy and abortion?
- What are the limitations of the strategies used by adolescents, to curb adolescent pregnancy and abortion?

Integrative Review Objectives

General Integrative Review Objective

To Assess the existing Adolescents strategies used to curb adolescent pregnancy and abortion.

Specific Integrative Review Objectives

- To identify the strategies used by adolescents, to curb adolescent pregnancy and abortion.
- To explore the components of the strategies used by adolescents to curb adolescent pregnancy and abortion.
- To determine the limitations of the strategies used by adolescents to curb adolescent pregnancy and abortion.

Integrative Review

Conceptual Framework

This work was guided the 6 stages integrative review conceptual framework of Toronto and Remington (2020). An abridged version of was used to better fit the work's context. Thus, review made 6 stages integrated in 4 chapters and 4 phases:

Phase1: Conceptual Phase

Chapter 1: Introduction

- Formulation of the review purpose and questions

Phase 2: Empirical Phase

Chapter 2: Methodology

- S2: Systematically search and select literature
- S3: Quality appraisal

Phase 3: Interpretive phase

Chapter 3: S4: Data analysis and synthesis

- S4: Presentation of Results

Chapter 4: S5: Discussion, conclusion, and recommendations

Phase Four: Communicative Phase

S6: Dissemination of findings

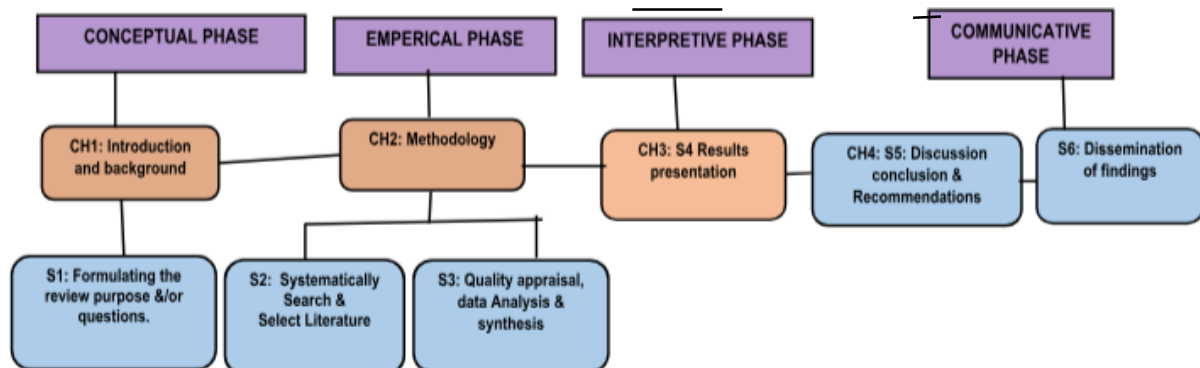


Figure 1: Integrative Review Framework Revealing the Phases And Stages

Source: Atanga Vivian Manka 'ah (2022)

2.0 METHODOLOGY

Review design

This was an integrative review with narrative thematic analysis, and a descriptive qualitative synthesis. An integrative review design was chosen because the review question is broad needing a broad approach and secondly, there was need to appraise strategies thus best design as stipulated by Toronto and Remington (2020). A search was conducted to include studies from the year 2000-December 2020.

Systematic Search and Selection of Literature

Selection Criteria/Criteria for Eligibility

Inclusion Criteria

- All empirical and theoretical literature on strategies or related approaches aimed at curbing Adolescent pregnancy and abortion by adolescents.
- Qualitative, quantitative, and mixed research, relevant grey literature.
- Studies published in English and French languages.
- Studies from the year 2000-2020.
- Full-text articles with a clear definition/identification of adolescent according to the WHO definition of adolescent (age 10–19 years).

Exclusion Criteria

- Literature primarily related to adults or had mixed population and did not include a sub-analysis of an adolescent population. it will not reflect the reality of the phenomenon of focus for ADOs.
- All unpublished theses/dissertations below master's level, pilot studies not evaluated and protocols (difficulties of access, need for methodological rigor).
- Studies on ADOs in vulnerable settings such as refugee camps, street children. (not reflect the real situation of focus).
- Abstracts-only and incomplete studies (pertinent information may be missing).
- Editorials and comments, position papers, keynotes, tutorial summaries (need for methodological rigour).
- Studies which did not actively involve adolescents as target population.
- Articles with no specified age group (target adolescent population cannot be determined for reliable result).

Search Sources and Search Strategy

Search was conducted in a stepwise manner in 4 phases. The first phase was a broad preliminary search that was developed with the guidance of an experienced librarian using natural language to generate key word, the Mesh controlled language to help generate a list of appropriate search terms (key words), and then controlled language (Mesh) with revision using Boolean Logic operators OR, “AND” and “Not” for richer results. The final search strategy involved a title and abstract search of the following terms: “Adolescent pregnancy” OR “Teen pregnancy” OR “Adolescent Abortion” OR “Teen Abortion”*; (“Adolescent Abortion” OR “Teen Abortion”*) AND (“curbing strategies”*); (Adolescent pregnancy” OR “Teen pregnancy” OR “Adolescent Abortion” OR “Teen Abortion”*) AND (“Prevention strategies”*); (“Adolescent pregnancy” OR “Teen pregnancy” OR “Adolescent Abortion” OR “Teen Abortion”*) AND (“Prevention Approaches” OR “prevention programs” OR prevention interventions”*); (“Adolescent pregnancy” OR “Teen pregnancy” OR “Adolescent Abortion” OR “Teen Abortion”*)AND (“Prevention strategies” OR “Control strategies” OR “Limiting strategies” OR “control approaches” OR “control interventions”*)).

In the second phase, literature search was conducted using 9 specific electronic databases of nursing and related sciences; HINARY, CINAHL (comprehensive database for nursing research and information), Cochrane library, EMBASE, Medline, Pubmed, Pubmed Central,

Scopus, Joanna Briggs Institute and PsycInfo. In the third phase, there was manual search for additional sources of data and in the fourth phase, there was consultation with experts and colleagues in the fields related to adolescent health. In the second phase, literature search was conducted using 9 specific electronic databases of nursing and related sciences; HINARY, CINAHL (comprehensive database for nursing research and information), Cochrane library, EMBASE, Medline, Pubmed, Pubmed Central, Scopus, Joanna Briggs Institute and PsycInfo. Searches were conducted between October 2019 to December 2020. Update was done in March 2021. Search considered studies between the years 2000 and 2020. Due to the nature/lack of standardisation of MeSH terms in the field it was decided a title and abstract search was the most appropriate way to proceed.

In the third phase, there was search for additional sources of data through a manual search of reference lists of included reports and articles, other online and off-line resources. Relevant Gray literature were also searched using the search engine Google scholar, Google Chrome, and Microsoft Edge.

In the fourth phase, there was consultation with experts and colleagues in the field of Adolescent, maternal and child health and related fields for recommendations on any new data sources not yet identified through the means described above, including unpublished data. Of 7 experts consulted, only two responded with sources of information consisting of articles not available through the databases searched. A summary of the search strategy is as presented on the figure below. (See Fig 2.)

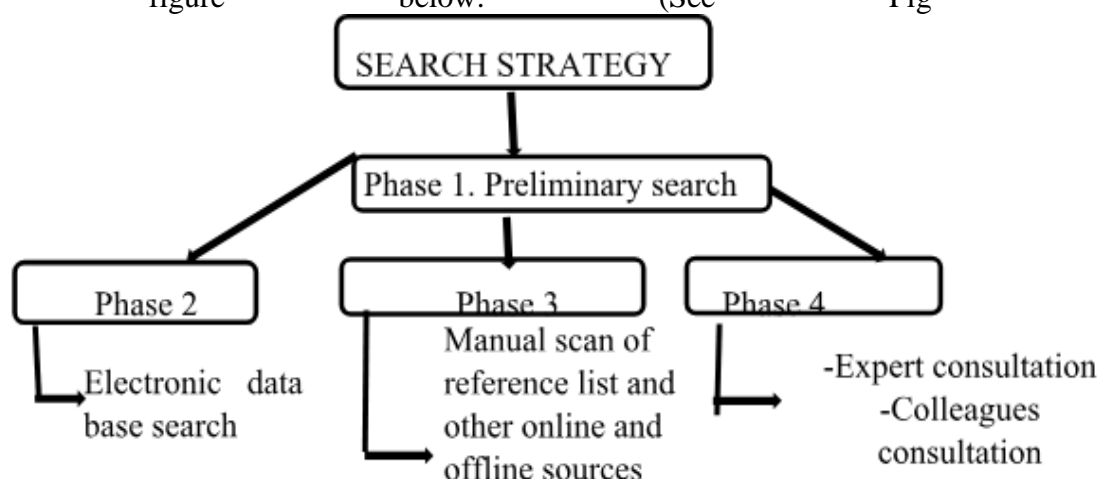


Figure 2: Major Steps in Data Search for Study Materials

Source: Atanga Vivian Manka 'ah(2022)

Screening for Study Selection

This review process was undertaken according to Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) guidelines (Moher et al, 2015). This was done in 4 main phases. Firstly, search results were imported into the Zotero database where duplicates were screened for and deleted. Secondly, articles then went through an extensive screening process to identify sources of relevant data. Thirdly, initially, titles were scanned for relevance and titles obviously not meeting the inclusion criteria were excluded. Then, the screening of abstracts of those titles that met the inclusion criteria began and abstracts not meeting the inclusion criteria were excluded. Following the screening of abstracts was the reading of full-text articles of the included abstracts, and articles not meeting all the inclusion criteria were excluded, as well as the articles that did not have full text available. Lastly, the full texts that

met the inclusion criteria were then sorted into studies. Finally, the rigorous and extensive assessment of the included full-text articles as they met the inclusion criteria was conducted. The visual summary of the review process was presented using the PRISMA flow chart as shown below. (see Figure 3).

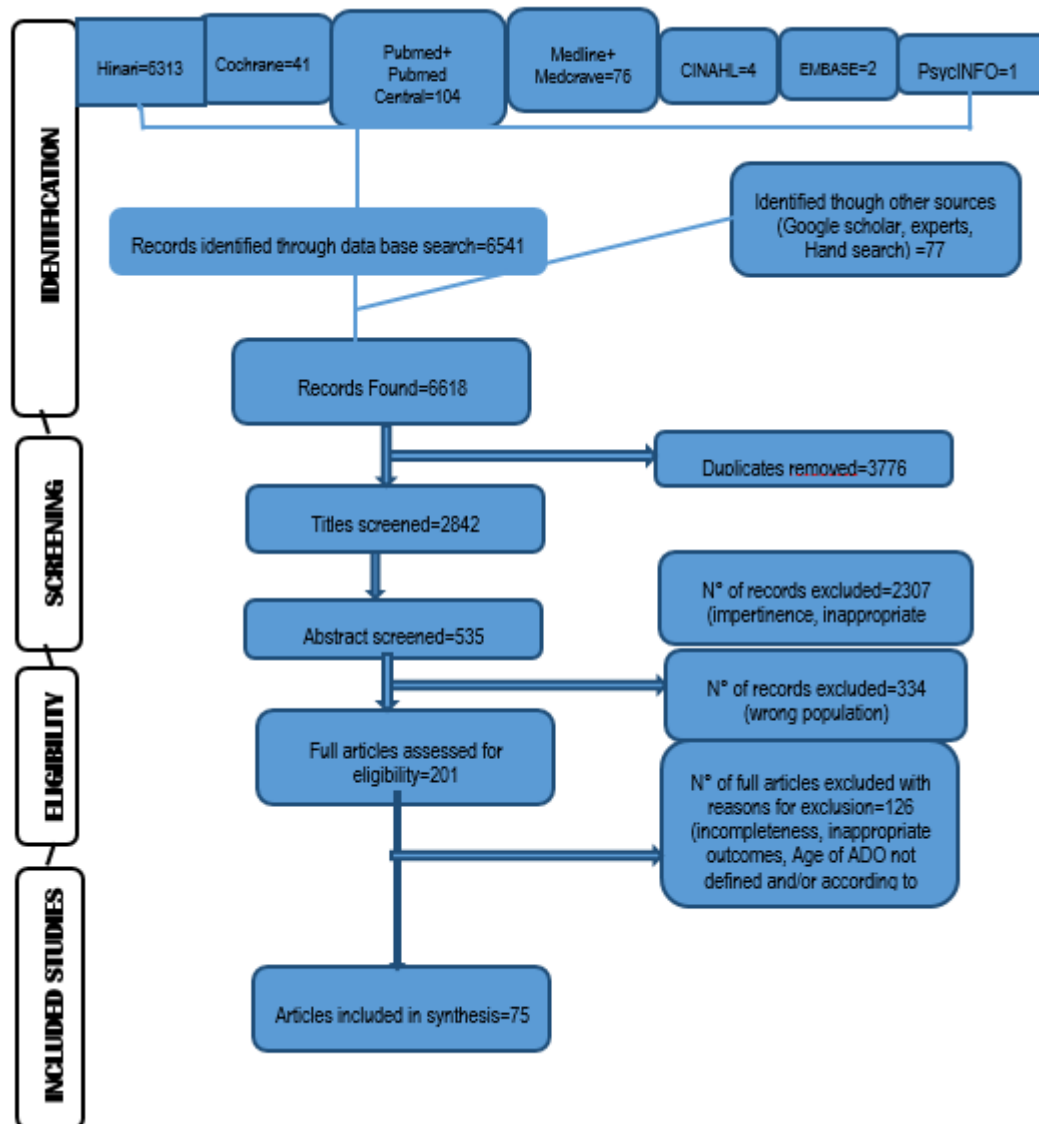


Figure 3: PRISMA Flow Chart of Visual Summary of the Review Process

Source. Atanga Vivian Manka'ah (2022) Adapted from PRISMA

Quality Appraisal of Selected Literature

To ensure accuracy and minimize bias and given the diverse types of literature/studies; the quality was assessed and graded separately for the different strategies and type of literature using the best-fit existing standard design-specific. Firstly, the different types of studies were assessed and graded according to the level of evidence and quality based on methodological approach using the John Hopkins Nursing Evidence-Based Practice evidence appraisal tool. This tool grades studies 5 levels of evidence and quality into 3 levels (High quality, Good quality and Low quality/major flaws) based on specific criteria (Dearholt, & Dang, 2012). The 5 levels of evidence include:

Level I: experimental study-randomized controlled trial (RCT) Systematic review of RCTs, with or without meta-analysis.

Level II: quasi-experimental study-systematic review of a combination of RCTs and quasi-experimental, or quasi-experimental studies only, with or without meta-analysis.

Level III: non-experimental study-Systematic review of a combination of RCTs, quasi-experimental and non-experimental studies, or non-experimental studies only, with or without meta-analysis, Qualitative study, or systematic review with or without a meta-analysis

Level IV: opinion of respected authorities and/or nationally recognized expert committee's/consensus panels based on scientific evidence. Includes: Clinical practice guidelines, Consensus panels.

Level V: based on experiential and non-research evidence. Includes Literature reviews, Quality improvement, program or financial evaluation, Case reports, Opinion of nationally recognized experts(s) based on experiential evidence (Appendix 1).

For quantitative studies, an abridged version of the Effective Public Health Practice Project (EPHPP) tool was used. Here each study was given an overall rating as strong (no weak rating, moderate (1 weak rating) or weak (2 or more weak rating) based on 8 criteria: study design, 2) selection bias, 3) withdrawals and drop-outs, 4) blinding, 5) intervention integrity (if applicable), 6) data collection practices, and 7) analysis and confounders (Armijo-Olivo et al, 2012; Heller et al, 2008). (Appendix 2). For qualitative studies an abridged version of the Critical Appraisal Skill Program (CASP) guide was used (rating studies as strong, moderate, weak or unclear based on nine criteria: 1) aims, 2) methodology, 3) link to theory, 4) study design, 5) fieldwork procedures, 6) data analysis, 7) credibility of findings, 8) reflexivity (Process of examining both oneself as a researcher and the research relationship) and 9) ethical considerations. (Appendix 3). For mixed studies (quantitative and qualitative), the overall quality of each study was assessed by summarizing the section ratings for each criterion into a global rating for the study as strong (no weak ratings), moderate (one or two weak ratings), or low (three or more weak or unclear ratings) quality. Systematic reviews (scoping, integrative, narrative, systematic review) were critically appraised using the GRADE system of rating quality of evidence. GRADE is the most widely adopted tool for grading the quality of evidence and for making recommendations (Siemieniuk and Guyatt, 2020).

It distinguishes between quality assessment conducted as part of a systematic review and that undertaken as part of guideline development (recommendations). GRADE has four levels of evidence; also known as certainty in evidence or quality of evidences that are applied to a body of evidence, not to individual studies (Siemieniuk and Guyatt, 2020; Balshem et al, 2011): very low (The true effect is probably markedly different from the estimated effect), low (The true effect might be markedly different from the estimated effect), moderate (The authors believe that the true effect is probably close to the estimated effect), and high (The authors have a lot of confidence that the true effect is similar to the estimated effect). This rating of the body of evidence is based on 5 main criteria; Imprecision; Indirectness; Inconsistency and Publication bias. The quality of evidence is best applied to each outcome because the quality of review evidence often varies between outcomes (Balshem et al, 2011). An overall GRADE quality rating can be applied to a body of evidence across outcomes, usually by taking the lowest quality of evidence from all the outcomes that are critical to decision making (Guyatt et al, 2013). Quality of recommendations are rated differently from quality of evidence as strong (all or almost all persons would choose that intervention (No need for presentation of both options) and weak (recommendations imply that there is likely to be an important variation in the

decision that informed persons are likely to make (Need for a shared decision-making process). (Appendix 1).

Given that grey literature is considered a vital resource for health and that it should be appraised to the same standard, and using the same critical appraisal tools as those used to evaluate black literature as stipulated by Tyndall (2013). Choosing of quality and relevant grey literature in to study was guided by the AACODS guideline which include 6 criteria to be considered: 1. Authority, 2. Accuracy, 3. Coverage, 4. Objectivity; 5. Date and 6. Significance (Tyndall, 2010).

Data Abstraction/Extraction

The selection of information to be extracted was informed by the research questions, the different types of evidence and strategic approaches and the guidelines of the different quality appraisal tools. Data from these studies included was extracted and data matrices were constructed in Microsoft Word. Regarding research strategies for qualitative, quantitative and mixed research works the information extracted include: Identification information (Authors, publication year, setting and its nature, type of research,/study, article type, domain of research, research title and objective); methodological characteristics (research design, level of evidence, sampling and participant characteristics); key results including outcome measures; characteristics of methodological rigor, and study limitations. For systematic reviews the information extracted include: identification information (publication year, setting and nature, title, document type and publisher, objectives and outcome measures), Methodological characteristics (study design, evidence level sampling characteristics, key results) and Methodological rigor (risk of bias, imprecision, inconsistency, indirectness, recommendation and rating, global quality rating and limitations). For other reviews, the information extracted include: identification information (Author(s), publication year, setting and nature and title) and Methodological rigor (objectives, study design and evidence level, key results, clarity of evidence of expertise, meaningful analysis of conclusion, gaps identification, presence of recommendation) and study limitations.

For programs/interventions strategies, information extracted include: identification (Author, year, setting/country and nature, program title/name); Methodological rigor (objective, outcome measures, design and evidence level, program/intervention components and mode, participant characteristics, frequency and facilitators, key results, adequate description of method, identification of outcome measures, adequate description on and interpretation of results, components of costs/benefits described, global quality rating and limitations). Data extraction matrices were created to record data extracted. Abridged versions are found in Appendix 2.

Data Analysis

A thematic analysis was done with a predominantly inductive approach based on the review questions. This method was chosen since proven best to explore the quality of the data and adapted for both qualitative and mixed studies and proven effective in integrative review (Hopia et al, 2016; Whitemore and Knafl, 2005; Joffe & Yardley, 2004). The recursive six-phase process of thematic analysis by Braun and Clarke (2006) was used. Analysis and synthesis were aided by the computer software ATLAS.ti 9. Firstly, there was familiarisation with the data, then generation of initial codes, searching for themes, reviewing of themes, defining, and naming themes, and finally production of the report.

Data Synthesis

A mixed-methods synthesis was used with a predominantly thematic approach where we first synthesized all studies separately according to their design (qualitative vs. quantitative), followed by an overarching synthesis across methodologies.

Quantitative Synthesis

For the quantitative studies we conducted a thematic summary where we first clustered the different strategic approaches into categories. For each approach identified, we assessed the number of studies, then the components of each of the approach and their frequencies. We then looked for common associations across studies and summarized these as themes organized guided by the review questions. Finally, we assessed the robustness of the quantitative synthesis by evaluating the number and relative quality of the studies for each theme.

Qualitative Synthesis.

For the qualitative studies we used thematic synthesis to analyze the data reported in the studies. First, using ATLAS.ti 9. software (Atlas Corporation, Berlin), we conducted open-ended coding on each text-unit (e.g. sentence or paragraphs) of the included studies. We focused on coding the “raw” participant data such as quotes, analyses and conclusions made by study authors as qualitative findings reported often reflect the authors’ own interpretations. The first round of coding generated initial broad themes (i.e., concepts identified in more than one study). Through an iterative process, these themes were subsequently broken into more refined codes and themes. Similar codes were then grouped together into descriptive themes, which in turn were grouped into analytical themes at a higher level. E.g. codes labeled “parental education of ADOs on sexuality”, parental attitude on ADO pregnancy were organized into the descriptive theme “parent-child communication on sexual and reproductive health”. This in turn was structured in the overarching analytical theme “quality of parent-ADO communication on sexual and reproductive health is capital in curbing ADO pregnancy and abortion”.

3.0 FINDINGS

Studies by Type and Year of Publication (2000-2020)

Table 1: Distribution of Studies by Type and Year of Publication

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Total
Systematic Review	-	-	2	-	-	-	-	-	-	-	3	-	1	-	2	2	6	4	1	1	4	26
Empirical studies	-	-	1	-	1	2	1	1	1	-	3	3	-	1	1	5	7	7	6	6	2	49
Dissertation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	1
Total	0	0	3	0	1	2	1	1	1	0	5	3	1	1	3	8	14	11	7	7	6	75

There were no studies before 2002, number of studies increased gradually between 2002 to 2015 with most studies carried out between 2016 and 2020. Most studies 65.3% (49) were primary empirical followed by 34.7% (26) systematic review.

Results by Review Questions

Types of Adolescent Strategies

Two main strategies are used by adolescents to curb adolescent pregnancy and abortion: research and outreach programs. Summary is as presented on the table below.

Table 2: Distribution of Adolescent Strategies by Type and by Context

Type of Strategy	Research (empirical +systematic reviews)	Outreach programs/interventions	Total
World	46	10	56
Africa	9	0	9
Cameroon	10	0	10
Total	65	10	75

Most adolescent strategy was research with 86.6% (65) followed by outreach programs with 13.4% (10); there was no outreach program (0%); neither for African nor Cameroon.

Components of the Different Strategies Used by Adolescents to Curb Adolescent Pregnancy and Abortion

Components were considered on three facets: major themes/topics of research, major outcome measures and major implementation components.

Components of Research Strategy

Common Research Themes for Adolescent Strategy

Table 3: Summary Presentation of Studies by Common Research Themes and Context

WORLD CONTEXT	AFRICAN CONTEXT	CAMEROONIAN CONTEXT
Education and sources of adolescent information on sexual and reproductive health (Macintyre et al, 2015; Chernick et al, 2016 ; Coyle et al, 2005 ; Sieving et al, 2011 ; Yoo et al, 2004 ; OAH, 2018 ; OAH and OPA, 2019 ; OPA , 2019 ; OAH , 2015 ; OAH, 2018 ; OPA, 2019 ; OAH, 2018)	Influence of access to ADO pregnancy prevention information and services (Ahinkorah et al, 2019; MBA et el, 2007; Ochiogu et al, 2010).	Prevalence and outcomes of ADO pregnancy (Henry et al, 2020; Tamambang et al, 2018; Njim & Agbor , 2017; Wirsiy,2019;Tebeu et al, 2017; Agbor et al, 2017).
Effectiveness/impact of ADO sexual and reproductive health programs (Macintyre et al, 2015; Chernick et al, 2016; Riquelme et al, 2005; Brinkman et al, 2016; Mueller et al, 2017; Mitchell et al, 2017; Black et al, 2006 ; Morrison-Beedy et al , 2013; O'donnell et al, 2002; Doniger et al, 2010; Barnet et al, 2010; OAH, 2017; Jennings et al, 2014)	Knowledge, access and use of ADO sexual and reproductive services (Amankwaa et al, 2017)	Knowledge and practice of contraception (Henry et al, 2020; Tebeu et al, 2017).
Contributing factors to the effectiveness of adolescent pregnancy prevention programs (Hadley et al, 2016)	Factors influencing decision making to keep or not to keep pregnancy by ADOs (Bain et al, 2019).	Factors associated to Adolescent pregnancy (Layu et al, 2018).
Adolescent sexual activity and use of contraception (Rose & Garrett, 2016; Young et al, 2018; Liddon, 2016; Decat et al, 2015; OAH, 2018)		Quality of parent-child communication on SRH (Atanga et al, 2015).
Prevalence and outcome of adolescent pregnancy (Sedgh et al, 2015).		

- Regarding research themes and in all contexts, there is great paucity in research and themes on adolescent abortion.
- Most World themes (67%) are focused on impact evaluations of ADO SRH programs/interventions with emphasis on discovery of what program attributes are most effective in reducing teen pregnancy and its antecedents.

- In Africa focus is predominantly on knowledge, attitudes, existing programs, and program satisfaction including factors influencing access to ADOPREG prevention information and services (67%). In Cameroon, most research focus is predominantly on basic elements of ASRH with emphasis on knowledge, attitudes, and rates including, prevalence and outcomes of ADO pregnancy (60%), followed by knowledge and practice of contraception (20%).

Major Common Outcomes Measured for Adolescent Research Strategy

Table 4: Summary Presentation of Outcomes Measured of Adolescent Strategies by Context

WORLD CONTEXT	AFRICAN CONTEXT	CAMEROONIAN CONTEXT
Types of SRH programs implemented; sites and frequency of implementation (Mueller et al, 2017).	Access of ADOs to pregnancy prevention information and source of information (Ahinkorah et al, 2019).	ADOs pregnancy and delivery rates (Henry et al, 2020 ; Tamambang et al, 2018; Wirsiy, 2019 ; Agbor et al 2017; Njim & Agbor ,2017) and abortion rates (Henry et al, 2020).
Rates/incidence of ADO pregnancy and abortion (Stephenson et al, 2008; Riquelme et al, 2005; Sieving et al, 2011 ; Sedgh et al, 2015), repeat pregnancy (Barnet et al -2010), unintended pregnancy rates (Kirstin et al, 2016), live births by age 20 years (Stephen et al, 2008). Barriers to safe abortion services (Macintyre et al, 2015))	Knowledge and attitude towards SRH education (MBA et el, 2007)	ADOs pregnancy and delivery outcomes (Tebeu et al, 2017; Agbor et al , 2017).
	ADOs Knowledge on SRH services, availability and use of SRH services (Reduced just to counselling only) (Amankwaa et al, 2017)	ADOs knowledge on condom use (Cumber and Tsoka-Gwegweni, 2016). Parental communication style, frequency, topics treated and age of commencement of adolescent SRH education (Atanga et al, 2015).

Table 4: Continuation

<p>Sexual risky practices and marital rates (Black et al, 2006).</p>	<p>Factors influencing ADOs decision making about pregnancy, degree of certainty of decision about pregnancy, barriers to safe abortion services (Bain et al, 2019).</p>	<p>Factors associated to ADO pregnancies (Henri, et al, 2020; Agbor et al 2017).</p>
<p>Attitudes towards sexual intercourse and limits set (Coyle et al, 2005); Refusal of sex and avoidance of sexual situations (Mitchell et al, 2017).</p>	<p>Unintended pregnancy rates (Ochiogu et al, 2010).</p>	
<p>Attitudes and beliefs about adolescent pregnancy (Doninger et al, 2010); beliefs about masculinity and cultural norms (OAH, 2015). Quality of Communication of adolescents with parents on SRH issues, ease and quality, sources of information/education of ADOs on SRH, frequency (Coyle et al, 2005). Availability of SRH services (Riquelme et al, 2005), Knowledge on and ability to identify local SRH, and use of SRH services (Stephenson et al, 2008; OAH, 2018), Age of initiation of sexual activity (Young et al, 2018), unprotected first sex, quality of current sexual relationship, diagnosis of STIs (Stephenson et al, 2008); numbers of sex partners in the last 6 months. Contraceptive intentions, use, and consistency of use with most recent partner (Sieving et al, 2013) (Brown et al, 2011; Young et al, 2018; Black et al, 2008). Factors influencing decision making about pregnancy and outcomes, degree of certainty of decision (Macintyre et al, 2015). Interest in and preference of text messages from emergency departments by ADOs on pregnancy prevention and sources (Chernick et al, 2016).</p>		

- In the world context, most outcomes are predominantly primary and proximal; emphasizing on measuring rates and behaviour change including evaluation of SRH services, availability, degree use SRH services and their barriers, rates of pregnancy, repeat pregnancy & abortion; existing ADO SRH programs and activities; and preferred source of SRH information/education and type and canal of information.
- In Africa, most outcomes are predominantly distal focusing measuring knowledge, attitudes, and program satisfaction including knowledge, attitude on SRH education, factors influencing ADOs decision making about pregnancy, barriers to safe abortion services, access of ADOs to pregnancy prevention information and source of information, ADOs Knowledge on SRH services.
- In Cameroon, most research outcomes are predominantly primary and distal; focusing on rates, measuring knowledge, attitudes, and program satisfaction including prevalence and associated factors to ADOPA; there was no evaluation outcomes.

Major Implementation Strategic Components

Implementation strategies of research was as varied as the research themes and included mainly data collection using appropriate tools sometimes preceded by training of appropriate data collectors. Most implementation strategy was SRE. Most research are not evaluated.

Components of Outreach Programs

There are six (6) major components of outreach programs aimed at curbing adolescent pregnancy and abortion. The six major components of the outreach programs with the subcomponents or strategies are as presented below.

- Sex and STIs/HIV Education Programs
- Protocols for Health Clinic Appointments and Supportive Activities Programs
- Service-Learning Programs
- Healing and Restoration Programs
- Collaborative approach Programs
- Child Development and Education AID/Motivation Programs (especially Teenage Girl).

A summary of the outreach programs and their components and sub-coponents are as summarised on the table below.

Table 5: Summary Presentation of Different Outreach Program Components and Their Subcomponents Components

Author, Year, setting and its nature (Rural, Urban, Semi-urban)	Program/ Intervention	Approach (school-based, hospital-based, etc)	Population characteristics (Sex, Age)	Program duration and Evaluation	Components and Sub-components	Impact (+/-)	
I. Sex and STIs/HIV Educational Programs							
Coyle et al (2005) USA (Urban)	Draw the Line/Respect the Line	Evaluate effectiveness of program to reduce sexual risk behaviors among middle school adolescents.	School-b	6-9 graders- Mean 11.5y (M+F)	DU=3years (20 Session of 45-50minutes per grade) -EV=1 Y after 9 th grade	Curriculum designing, SRE education (invitation, group discussion, video, demonstration session, follow-up visits). SRE (brain storming, text messaging, workshop, group discussion, face book discussion, EV).	+/-
OAH & Engenderhealth (2015.) USA (UB)	Gender Matters: Changing Teen's Perspective on Gender Roles to Decrease Teen Pregnancy	Empower youths with knowledge on gender norms to deconstruct negative norms.	School-b	14-16y (M+F)	DU=2wks EV=baseline , 6M, 12M	SRE (brain storming, text messaging, workshop, group discussion, face book discussion, EV).	+
OAH (2018). USA (RU)	Big Decision (Abstinence Plus Curriculum)	Help young people make healthy, informed decisions about sex.		9 th grader(10-19y)	DU=10 lesson(ADO), 2(parents). EV=NS	SRE, parental engagement (Recruitment, Classroom lessons, Homework with parents, Conversation with parents, training of teachers and parents, EV). SRE (recruitment, education, evaluation)	+
Mitchell et al (2017). USA (RU)	Circle of Life (COL)	Explore impact of COL on social cognitive theory, on trajectories of self-efficacy	School-b	11-16y (13y mean). (M+F)	DU=12M EV=Baseline , 12M	SRE (recruitment, education, evaluation)	+
Black et al (2006). USA (UB-Black ADOs)	Home-Based Mentoring Program	Examine effectiveness of program in preventing 2 nd births within 2y	Home and hospital-b	<18 (F)	DU=1yr (19-2wkly visits). EV=6,13,24 M	SRE, In-home follow up, mentoring (Invitation, Phone lessons, Video lessons - 15mins, Follow-up visits, evaluation), SRE (games and quizzes, role-plays, small-group projects, and brainstorming).	+
-OAH (2018). USA (UB)	Wise Guys.	Prevent teen pregnancy, STIs and dating.	School-b	9-12 th graders (10-19) (M)	DU=10-12wks (weekly 45-minute sessions)	SRE (games and quizzes, role-plays, small-group projects, and brainstorming).	+
Jennings et al (2014). USA (UB).	Teen Peer Education program (Teen PEP).	To evaluated the impact (Teen PEP on peer educator.	School-b	9 th graders (10-19y)	DU=2y(1 st advisors, 2 nd , daily peer educators). EV=NS	Training of program supervisors, peer educator training, peer-led teed education	

Morrison-Beedy et al (2013). USA (UB low inc	Sexual risk reduction intervention (SRR) supplemented with post intervention booster	Evaluate effectiveness of SRR intervention in SRR.	-School, hospital, community	15-19y	DU= 4 weekly 3H sessions+ Two 90mins booster EV= baseline, 3M, 6M	(activity-based facilitation, structured 16-unit curriculum. peer of five structured workshops with students) SRE, Booster meeting, distribution of incentives, sample collection (recruitment. Education, games, interactive group activities, and skits, collection of assessments and behavioral data using audio computer-assisted self-interview-ACASI)	+
Doniger et al (2010). USA-NY (UB & S-UB)	"Not Me, Not Now" Abstinence-Oriented, Adolescent Pregnancy Prevention Communications Program	impact evaluation to determine changes in awareness, knowledge, and attitudes toward abstinence and ADO pregnancy	School and community-b	12-14y. (M+F)	DU=3yrs (yearly survey by wave) EV= baseline, yearly for 3yrs.	Mass communications, campaigns, formation of community advisory groups, development of poster guides, sponsoring of community events (paid television and radio advertising, billboards, posters and poster process guides distributed in schools, educational materials for parents, and an educational series presented in school and community settings, education)	+
Stephenson et al (2008) Britain (RU+UB)	The long-term effects of a peer-led sex education program (RIPPLE)	Evaluate long-term effects of RIPPLE.	School-b	13-14y(M+F)	DU= 3 ; 1h sessions EV=6M, 18M, 54M, 7y	Peer-led SRE (life skills), home and school follow-up visits, distribution of incentives. (invitation, recruitment & training of peer educators, EV)	+/-
Brown et al (2011), Britain (UB & S-UB)	A theory-driven classroom-based intervention.	Evaluate program on Improving adolescent contraceptive use	School-b	11-18 (M+F)	DU=4wks, EV=baseline , 4wks.	Theory-driven SRE, distribution of materials (invitation, reading and writing, filling of workbook and	+

Kirstin et al (2016). Britain (UB)	Teens & Toddlers (T&T) positive youth development (PYD) and teenage pregnancy prevention program.	Evaluate lived-experiences of program participants.	School-b	13-114y (F)	DU=18-20wks (3-4h once weekly). EV=NS	questionnaire, EV) SRE (life skills), child mentoring in nursery, one-one counsellor coaching, giving of award (Invitation and consent, recruitment, teaching, interview, FGD, Participant observation, EV)	+
Hadley et al (2016). Britain (RU and UR)	United Kingdom's ten-year teenage pregnancy strategy for England (1999-2010)	Half the <18 conception rate (EV, implementation, accomplishment).	Varied	<18y (M+F)	DU=10y. EV=1998-2014	SRE, coordinated support for young, Collaborative action, increase access to contraception, communication campaign.	+
Brinkman et al. (2016). Western Australia (RU+S-UR+UR)	Virtual Infant Parenting (VIP) program (Infant simulator program)	Investigate the effect of such a VIP program on pregnancy outcomes (birth, induced abortion)	School-b	13-15y (F)	DU=3y (2003-2006), 1Week completion EV= 1wk, 3M, Age 20	SRE, giving of incentives (invitation, recruitment; education, evaluation)	-
II. Protocols for Health Clinic Appointments and Supportive Activities Programs							
Sieving et al (2011). USA(UB)	Prime Time	Reduce pregnancy risk among adolescent girls seeking clinic service	Hospital-b	13-17yr (F)	DU=12M (monthly visits, 7 sessions teaching) EV=Baseline , 12M	Case management, peer educator training and employment, peer-leadership, service learning, payment of incentives. (invitation, 18-monthly visit by managers, Peer-educator leadership-hand-on, group discussion, homework, payment of incentives EV, end of program celebration).	+
OAH and OPA (2019). USA. (UB).	Hartford Teen Pregnancy Prevention Initiative (HTPPI).	Reduce rates of teen pregnancy, STDs. establish SRE system, train peer-educatoters, advocates.	School-b	6-12 graders -M+F	DU=NS . EV=NS	Collaborative approach, school- and faith-based education interventions, increasing access to RH services (regrouping partners, videos, games, brainstorming, roleplaying, skill building, group discussions, Teen nights,	+

OAH (2017). USA (RU)	Delta Health Alliance Teen Pregnancy Prevention Program (TPP).	Reduce teen pregnancies rates STIs, and improve HC linkages	School + Community	15-19yrs (M+F)	DU=NS. EV=NS.	Teen-only waiting room, training of physician on ASRH). Curriculum development, SRE, Provision of safe and supportive environments and positive youth development and trauma informed services, linkages of health services to partner health clinics (recruitment, education, evaluation)	+
III. Service-Learning Programs							
Yoo et al (2004). USA (UB).	Students of Service (SOS) Program	Evaluate SOS program for Sexual Abstinence	School-b	10-12graders	DU=5y (seven monthly 50mins session). EV=Yearly-5	SRE (life skill), training of per-educators and teachers, peer monitoring, social worker supervision (family Sessions-First 2yrs, parental newsletters-last 3yrs) essay and poster contests, and teacher training and support activities)	
O'Donnell et al (2002). USA (UB).	Reach for Health Service Learning Program. (RFH-CYS intervention.	Evaluate sustained effectiveness of RFH-CYS on reducing sexual initiation and recent sex	School-b	7th-10th graders (M+F)	DU=2y (90 h -3 h/wk for 30 sessions). EV=baseline , 2y after (Grade 10)	Field work, classroom education, curriculum development, giving of incentives, (recruitment, orientation to community, training of trainers and teachers, field placement, supervision of field work-reading to elders; assisting with meals; helping with exercise, recreation, and arts and crafts groups),	+
IV. Healing and Restoration Programs							
OPA (2019). USA (UB)	Deceptions Program	Teach to recognize and avoid sexual coercion, prevent teen pregnancy	School-b	7 th graders (M+F)	DU=NS. Six 45-50min lessons, 16wkly grp meeting, EV=NS	SRE (deception curriculum), Coaching and resource referral, Trauma recovery and empowerment	+

Barnet et al (2010)	Computer-Assisted Motivational Intervention (CAMI)	Change behaviour through enhanced motivation to use contraception & avoid pregnancy	Community & home-b	12-18y (F)	DU=2Y (9 quaterly session).EV= baseline, 2y	group sessions, Parent participation (recruitment, classroom lessons, workshops, one-on-one coaching, videos, Evaluation) Parenting education, motivational interview, counseling , case management, home visits.	+
OAH(2018). USA- Luisiana- Urban.	Practice Self-Regulation	decrease risky sexual behavior of youth affected by adverse child experiences and promote their ability to regulate behavior.	Hospital-b	14-19y (M+F)		Therapy-education session; workbook & fact sheets, multisensory activities (visualization, art therapy, breathing exercises, personal shield)	
V. Collaborative approach Programs							
Mueller et al (2017). USA (UB)	Healthy teen Network program (multicomponent)	To reduce teen pregnancy and birth rates	School & Community	All ASRH stakeholders	DU=5y(2011-2015) EV=End of program	CSE, educating key stakeholder, collaborative work, community support, establish evidence-based guidelines for ASRH, community mobilization, workforce development.	+
OPA (2019). USA (UB).	Thrive: Sexual Health Collective for Teen Pregnancy Prevention	provide education, ensure medical access and community engagement	School and Community	13-19y (M+F)	DU=NS EV=NS	SRE for ADOs and parents (risk reduction), Collective impact approach (bring together partners), Increasing access to reproductive health services, Community engagement	+
VI. Child Development and Education AID/Motivation Programs							
Kirby et al (2002; Philliber et al, 2001).	The Children's Aid Society-Carrera Program (CAS-Carrera Program)	Prevent teen pregnancy (Evaluation)	Home, school, community, hospital-based	13-15y (M+F)	DU=3y EV=3y	Holistic approach: Education, sports, provision of contraception, special events, paid employment, mental health care and comprehensive medical care, provision of	+

Duflo et al (2014); Stephenson et al., 2008 ; Handa et al, 2015).	Conditional and Non-Conditional Cash-Transfer Program	To encourage appropriated child development and education.	School and home-b	4y, 13-5y	DU=Varied Evaluation=Varied	services to parents and other community members (academic assessment, tutoring, homework, preparation for standardized exams, and assistance with college entrance, job club, stipends, individual self-expression through the arts) + Conditional cash transfers, provision of school uniforms, giving of incentives to control schools not to spend money on anything on SRH education, aid to families for upbringing of children.
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- Six (6) major types/groups of outreach programs aimed at curbing adolescent pregnancy and abortion were identified with a total of 26 programs distributed under the 6 types. Each type has sub-components. These main types/groups include Sex and STIs/HIV Education Programs; Protocols for Health Clinic Appointments and Supportive Activities Programs; Service-Learning Programs; Healing and Restoration Programs; Collaborative approach Programs; Child Development and Education AID/Motivation Programs (especially Teenage Girl).
- Some programs were multifaceted (multiple components) components in its implementation strategies.
- About 86% (21) of all the adolescent programs are primary prevention programs with only 16% (4) being secondary prevention programs (Sieving et al, 2011; OPA, 2019; Barnet et al, 2010; OAH, 2018). Primary prevention programs were the least.
- Some programs had multifaceted components in its implementation.
- All these programs appear complementary. Sex and HIV education programs, Protocols for Health Clinic Appointments and Supportive Activities Programs, and service-learning programs appear closely related. The first two groups of and in different formats (group sessions /one-on-one) (Coyle et al, 2005; OAH & Engenderhealth (2015; OAH, 2018 ; Mitchell et al, 2017 ; Jennings et al, 2014; Morrison-Beedy et al, 2013; Doniger et al , 2010 ; Stephenson et al, 2008 ; Kirstin et al, 2016; Brinkman et al, 2016; OAH, 2018; OAH and OPA, 2019; OAH, 2017). On the other hand, service-learning programs and Healing and Restoration programs aims at adolescent development and building relational skills and connecting ADOs to good models for healthier and greater future choices; they address nonsexual antecedents such as connections to adults, belief in the future, negotiation skills etc (Sieving et al, 2011; Yoo et al, 2004; O'donnell et al, 2002; Black et al, 2006).

- Collaboration programs and Child Development and AIDs/Motivation programs set the platform for gathering of all concerned stakeholders, establishing, and executing a good plan for ensuring provision and maintenance of needs for healthy child growth, development, maturation, hence better face the challenges of adolescent.

Limitations of the Different Strategies Used by Adolescents to curb Adolescent Pregnancy and Abortion

Limitations of Research Strategy

Table 6: Summary Presentation of Limitations of Research Strategy by Context

WORLD CONTEXT	AFRICAN CONTEXT	CAMEROONIAN CONTEXT
Non-use of theory for most studies where applicable (5/7)	Non-use of theory for most studies where applicable (4/6) (Ahinkorah et al, 2019; Ochiogu et al, 2010)	Non-use of theory (9/10studies).
-No differentiation of intervention and results by age stratification (Black et al, 2006).	Small sample size-problem with generalization	No separation of adolescent age groups (Henry et al, 2020; Tebeu et al, 2017, Njim & Agbor, 2017)
Most participants were late adolescents (>15yrs) (-Young et al, 2018; -Riquelme et al, 2005).	Most age group considered and those who participated were late adolescents (>15yrs)Ahinkorah et al, 2019 ; -Odimegwu et al, 2016 ; Ochiogu et al, 2010 ; Godfred et al, 2017 ; Bain et al, 2019).	Most participants were late adolescents (>15yrs)
No pre-test of tools (27/33)	No pre-test of tools (MBA et el, 2007)	No pre-test of tools (9/10)
Data quality, representativity and generalization problems as many studies were retrospective (-Rose & Garrett , 2016; Liddon et al, 2016)	Type of study poorly sated (Amankwaa et al, 2017)? Difficulty objectively analysing facts.	Data quality, representativity and generalization problems as many studies were retrospective (Wirsiy,F.S , 2019, Tebeu et al,2017 ; Agbor et al 2017)
Most studies targeted female adolescents and even for those that targeted both sexes, Participants predominantly females.	Most studies targeted female adolescents and even for those that targeted both sexes, Participants predominantly females.	Most studies targeted female adolescents and even for those that targeted both sexes, Participants predominantly females.

Table 6: Continuation

<p>Most studies were institutional-based (hospital- or school-based with only one community-based (Odimegwu et al, 2016)</p>	<p>Most studies were institutional-based (hospital- or school-based with only one community-based (Odimegwu et al, 2016)</p>	<p>Most studies were hospital-based (9/10)</p>
<p>Attrition bias due to anonymous withdrawal or absence in one or more follow-up points (Brown et al, 2011)</p>		<p>Small sample size-problem with generalization (Tamambang et al, 2018; Wirsiy,2019 ; Henri, E et al, 2020; Agbor , 2017)</p>
<p>No implications of the study given for most studies (19/33)</p>		<p>Declarative nature of the responses associated with the age respondents (strong subjectivity) (Henry et al, 2020)</p>
<p>No study limitations given for most studies (23/33).</p>		<p>No experimental studies No implications of the study given for most studies (8/10)</p>

- Limitations common to all three contexts include non-use of theory for most studies where applicable; no differentiation of intervention and results by adolescent age stratification; most participants or those targeted were late adolescents (≥ 15 yrs) and mostly female adolescents, no blinding, and no tool pre-testing for most studies.
- In the word context, common limitations of research include Attrition bias, no implications and study limitations given for most studies. All limitations in the African context were very similar to those in Cameroon and include small sample size; poor mastery of data collection tool and methods-thus poorly stated or not stated at all; most studies were institutional-based (school or hospital). Particularly to Cameroon, limitations include most studies were retrospective with non-experimental and no implications of the study given for most studies.

Limitations of Outreach Programs

World Context

- Multi-faceted (components) strategies without specific impact evaluation, thus not possible to identify direct causative pathways or estimate the relative contributions of each strategic component (Hadley et al, 2016).
- Too long evaluation period (sometimes up to 5, 7 and even 10yrs years later-tendency for lost to follow-up (Hadley et al, 2016; Brinkman et al, 2016).
- Attrition bias due to anonymous withdrawal(dropouts) or absence in one or more follow-up points (Barnet et al, 2010).

- Self-reported data which may be biased in favor of the reporter and may be differentially reported across reporters (Mueller et al, 2017; Coyle et al, 2005; O'Donnell et al, 2002).
 - Most programs targeted or had as participants late adolescents (≥ 15 yrs) (OAH and OPA, 2019; OAH, 2015; OAH, 2018; OAH, 2017, OPA, 2019).
 - No differentiation of intervention and results by age stratification (Black et al, 2006).
 - Most studies targeted female adolescents and even for those that targeted both sexes, Participants predominantly females.
 - Very few home-based programs with the majority being school based (3/17 (Black et al., 2006; Barnet et al, 2010; OAH, 2018).
 - No pre-test (or not stated) of tools for all studies (17/17)
 - Non-use of theory or use not stated for most studies where applicable (12/17)
 - No study limitations given (or not stated) for most studies (15/17).
 - No implications of the study given for most studies (13/17).
 - No significance/evidence level given for most studies (OAH and OPA, 2019; OPA, 2019; OAH, 2015; OAH, 2018; OAH, 2017; OPA, 2019; OAH, 2018).
 - Convenience or purposive sampling predominant for most qualitative studies-bias and representativity issues (Doniger et al, 2010; Yoo et al, 2004).
 - Outcomes and methodology not clearly presented for some programs (OAH, 2018).
- ❖ *Outreach programs' common limitations were very similar to those of research strategy irrespective of the context given above and include Multi-faceted (components) strategies without specific impact evaluation, thus not possible to identify direct causative pathways or estimate the relative contributions of each strategic component, non-use of theory for most studies where applicable; no differentiation of intervention and results by ADO age stratification; most participants or those targeted were late adolescents (≥ 15 yrs) and mostly female adolescent, no blinding and no tool pre-testing for most studies.*
- ✚ *Specific to outreach programs in the world context, are unclear statement of outcomes measured, too short program and too long program.*
- ✚ *In the Cameroonian context, no program meeting inclusion criteria was identified for Adolescent strategies.*

Discussion

Different Strategies Used by Adolescents to Curb Adolescent Pregnancy and Abortion

Most adolescent strategy was research with 86.6% (65) followed by outreach programs with 13.4% (10); there was no outreach program identified (0%); neither for African nor Cameroon. Predominant research strategy may be due to the negative public health and socio-economic impact of the ADO pregnancy and abortion phenomenon needing reliable data to inform effective decision-making to resolve the problem. No out-reach program in Africa or Cameroon may be because SRH issues and particularly concerning adolescent is still considered a taboo by most parents as stipulated by (Yibrehu and Mbwele, 2020; Atanga et al, 2015). This may greatly affect the effectiveness of interventions geared towards curbing the ADO pregnancy and abortion as the views of adolescents and parents as adolescent legal representatives who are key stakeholders and directly touched by the phenomenon will not be considered in

decision making. No study was identified that separated strategies as that in this study for which comparison could be made.

Components of the Different Strategies

Components of Research

Regarding research themes and in all contexts, there is great paucity in research and themes on adolescent abortion. Paucity of research and themes on adolescent abortion could be due to the complexity, sensitivity of the phenomenon and the great variation in perspectives of the phenomenon by different contexts even at all ecological levels. Notwithstanding, given the great impact of the phenomenon, it must be addressed if positive change is expected; what better means than research will do this. Most World themes (67%) were focused on impact evaluations of ADO SRH programs/interventions with emphasis on discovery of what program attributes are most effective in reducing teen pregnancy and its antecedents. In Africa focus was predominantly on knowledge, attitudes, existing programs, and program satisfaction including factors influencing access to ADO pregnancy prevention information and services (67%). In Cameroon, focus was on knowledge, attitudes, and rates including, prevalence and outcomes of ADO pregnancy (60%), then knowledge and practice of contraception (20%).

Research outcomes generally reflected in the themes were as varied as the themes. In the world context, most outcomes were predominantly primary and proximal; emphasizing on measuring rates and behaviour change in Africa, most outcomes were predominantly distal focusing knowledge, attitudes, and program satisfaction including knowledge, attitude on SRH education, factors influencing ADOs decision making about pregnancy, barriers to safe abortion services, access of ADOs to pregnancy prevention information and source of information, ADOs Knowledge on SRH services. In Cameroon, most research outcomes were predominantly primary and distal; focusing on ADOs knowledge on condom use, factors associated to ADO pregnancies, and prevalence of adolescent births and abortions; there was no evaluation outcomes. Very similar trends and outcomes for the global context were revealed by many authors in their systematic review (Brindis et al, 2020; Nkhoma et al, 2020; Hardee et al, 2017; Oringanje et al, 2016; strunk et al, 2016; Philliber, 2015; WHO, 2012; Kirby, 2002). In the African and Cameroon context, similar trends and outcomes were also revealed by many authors in their systematic reviews (Yibrehu and Mbwele, 2020; Zogo and Nsangu, 2018, Tamambang et al, 2018; Kassa et al; 2018, Phillips & Mbizvo 2016, Atanga et al, 2015).

With respect to implementation strategies, in all contexts, they were as varied as the research themes and included mainly data collection using appropriate tools sometimes preceded by training of appropriate data collectors. Moreover, the research or interventions already carried out need to be evaluated; all these to better inform decisions making towards curbing ADO pregnancy and abortion. This again reflects the state of the limited state of research in the African and Cameroon context and calls for more and high-quality research to be carried out. Moreover, the research or interventions already carried out need to be evaluated; all these to better inform decisions making towards curbing ADO pregnancy and abortion.

Components of Outreach Programs/ Interventions

Regarding adolescent strategies, about 86% (21) of all the adolescent programs were primary prevention programs with only 16% (4) being secondary prevention programs (Sieving et al, 2011; OPA, 2019; OAH, 2018). Tertiary prevention programs were the least. This may be reflective the state of knowledge on the problem and the degree of efforts put in to resolve the problem. Primary prevention programs were effective in reducing adolescent pregnancy and abortion. This is in concordance with the studies many authors (Nkhoma et al, 2020; Hindin et

al, 2016; Manlove et al, 2002). This was however contrary to the finding from a systematic review with meta-analysis by DiCenso et al (2002) who rather found that primary prevention strategies do not delay the initiation of sexual intercourse, improve use of birth control among young men and women, or reduce the number of pregnancies in young women.

In addition, most educational programs (85.7%) were effective in reducing ADOPREG except two programs; “Draw the line, respect the line” (purely theoretical- education program); which was effective only for male but not for females (Coyle et al, 2005) but effective with post intervention booster education program even for girls (Morrison-Beedy et al, 2013), and “virtual infant program (VIP)” which was really ineffective and revealed rather a higher overall pregnancy risk and pregnancy in the cases than the control group (Brinkman et al, 2016). The success of educational programs in curbing ADOPA is in concordance with studies carried out by most authors (Nkhoma et al, 2020; Hindin et al, 2016; Kirby, 2002; Manlove et al, 2002). It is however contrary to the findings of a systematic reviews by DiCenso et al (2002) and Haberland & Rogow (2015), who revealed that primary prevention strategies (Educational programs) do not relatively significantly delay the initiation of sexual intercourse, improve use of birth control among young men and women or rate of pregnancy. Unique educational program, not even in multicomponent program and abstinence-only education programs do not delay the initiation of sexual intercourse or improve secondary abstinence but significantly increased reported condom use at last sex. (Oringanje et al, 2016; Hindin et al, 2016; Manlove et al, 2002, Diop et al, 2004); This may be because most of the educational programs were given to children at an advanced age (≥ 13 yrs for most) when attitude and beliefs regarding sexual initiation had already been formed as purported by (Doniger et al, 2010), and some of the ADOs might have already initiated sexual activity. Successful for boys may be due to delayed attainment of puberty for boys compared to girls in initiation of sexual activity. This implies need for education programs to commence at earlier age even as demanded by students (Yoo et al, 2004); and need for active implication of parents. Main component is sexuality education. Conclusively, primary prevention program, especially education programs have a positive impact on ASRH: however, it appears significantly ineffective in curbing ADO pregnancy and abortion if carried out as a unique component (SRE). Abstinence programs don't work; not even as a multicomponent program. Thus, Educational programs aimed at curbing ADO pregnancy and abortion should be Multifaceted and begin early for effectiveness.

Moreover, Protocols for Health Clinic Appointments and Supportive Activities Programs have proven to have positive effects on condom or contraceptive behavior (Strunk (2016, OAH and OPA, 2019; Kirby, 2002) and consequently positive impact in curbing ADO pregnancy and Abortion. Most of the effective interventions focused on sexual and contraceptive behavior, included one-on-one consultation about the client's own behavior (Kirby, 2002; OAH and OPA, 2019). For the proximal outcome of contraceptive use, programs with the strongest results were those that provided contraception directly to young people (Hindin et al, 2016; Denno et al; 2015). Main components of these programs included: Curriculum development; Case management, peer educator training and employment, peer-leadership, service learning, one-on-one consultation, direct provision of contraceptive, payment of incentives (Sieving et al, 2011); Collaborative approach, school- and faith-based education interventions, increasing access to RH services (OAH and OPA, 2019) and Curriculum development, SRE, Provision of safe and supportive environments and positive youth development and trauma informed services, linkages of health services to partner health clinics (OAH, 2017). Conclusively, successful health clinics services and supportive activities in curbing ADO pregnancy and abortion are those that build life skills, provide guidance to family planning especially those that provide direct contraception as they affect long-term life outcomes, not necessarily in the

immediate short term. This is supported finding of Hindin et al , 2016; Kirby (2002) as they affect long-term life outcomes. This also calls for need to render health clinics adolescent-friendly, consequently urgent need to train health care workers on ASRH and adolescent-friendliness.

Service-learning programs on their part revealed an overall positive impact in curbing ADO pregnancy and abortion. They seem would have stronger evidence in that they reduce actual teen pregnancy rates while youth are in the programs than any other type of intervention as they have less time for indulging in sexual activities especially risky ones. Main implementation strategies (components) of the service-learning programs include, training of per-educators and teachers, peer monitoring, social worker supervision (Yoo et al, 2004); Field work, classroom education, curriculum development, giving of incentives (O'donnell et al, 2002). Service-learning intervention that combines community involvement with health instruction can have a long-term benefit by reducing sexual risk taking among urban adolescents (O'donnell et al, 2002). Thus related stakeholders; especially parents and policy makers should strongly consider reviewing and designing efficient active and participative CSE curriculum, training of educators and institution of the program in schools earlier enough for effective and long-standing effects on curbing ADO pregnancy and abortion.

Considering healing and restoration programs, all three identified had a positive impact in curbing ADO pregnancy and abortion as they were successful in building ADOs protective factors, including knowledge to identify healthy relationship, avoid sexual coercion), build self-efficacy and connections to resources, and healthy relationships skills (OAH,2018; OPA, 2019) and change behaviour through enhanced motivation to use contraception & avoid pregnancy. Main components (implementation strategies) of the programs include: SRE (deception curriculum), Coaching and resource referral, Trauma recovery and empowerment group sessions, Parent participation (OPA, 2019); Parenting education, motivational interview, counselling, case management, home visits (Barnet et al, 2010) and Therapy-education session multisensory activities, visualization, art therapy, breathing exercises, personal shield (OPA, 2018). There were however very limited studies to compare this domain of programs and the ones identified in this study were not rigorously evaluated. Thus, need for need for further rigorous evaluation even as supported by Black et al (2006).

All two Collaborative programs were successful in bringing key stakeholders of ASRH issues and in giving teens an active voice in guiding the implementation of youth programs, including teen-friendly clinic practices, postponing sexual involvement (PSI), and the teen referral guide (OPA, 2019). It is difficult however to conclude on the impact especially direct impact in curbing ADO pregnancy and abortion since the main objectives of the program centered on implementation of the different components of the program and the extent of implementation. Moreover, the programs were multicomponent. Limited studies were identified focusing on collaborative efforts with which to compare studies. Major components (implementation strategies) included: CSE, educating key stakeholder, collaborative work, community support, establish evidence-based guidelines for ASRH, community mobilization, workforce development (Mueller et al (2017); SRE for ADOs and parents, Collective impact approach, Increasing access to RH services, Community engagement OPA, 2019). Most collaborative programs however don't actively involve parents as key partners. This may deter real positive impact in curbing ADO pregnancy and abortion. There therefore need more research on collaborative efforts and their evaluation, and the contribution of each component.

Child Development and AIDs/Motivation programs were successful in decreasing pregnancy in most settings, especially in girls and particularly CT programs. Thus had a positive impact

in curbing ADO pregnancy and abortion. They are however complex and resource intensive (Hindin et al, 2016) since they may have multiple components requiring significant financial and staff resources. Programs did not have significant positive behavioral effects on males who had initiated sexual activity prior to the onset of the program (Kirby, 2002). Thus, need for ASRH programs to begin earlier before attitude formation and sexual initiation as supported by Doniger et al (2010). Main components (implementation strategies) included: Conditional cash transfers, provision of school uniforms, giving of incentives to control schools not to spend money on anything on SRH education, aid to families for up-bringing of children (Duflo et al, 2014; Stephenson et al, 2008; Handa et al, 2015); Education, sports, provision of contraception, special events, paid employment, mental health care and comprehensive medical care, provision of services to parents and other community members (Kirby et al (2002; Philliber et al, 2001).

Conclusively, Effective programs/interventions aimed at in curbing ADO pregnancy and abortion has to be complementary, multifaceted and address fundamental socio-economic divisions in society, and diligent use of collaborative approach involving all key stakeholders; especially active implication of parents, ADOs and more specifically male parents and ADOs given the vital role they play in determining the success of these programs in curbing ADO pregnancy and abortion; this as supported by many authors (Wight et al, 2006; Santelli et al, 2000). Most especially it must begin earlier enough before attitudes and beliefs about SRH are formed; generally, before age 12. They also need to be rigorously evaluated for reliable information to inform better decision making.

Limitations of the Different Strategies

Limitations of Research Strategy

Regarding research strategy, limitations common all three contexts and involving all adolescents include non-use of theory for most studies where applicable; no differentiation of intervention and results by adolescent age stratification with some defining clearly just the age group to be sampled; most participants or those targeted were late adolescents (≥ 15 yrs) and mostly female adolescent, no blinding, and no tool pre-testing for most studies. All of these are indicative of lapses in methodology which could lead to reduction in the strength and reliability of the results; consequently, possible poor outcomes of decisions based on these results. This is similar studies which revealed methodological problems and stated that they must be considered seriously (Oringanje et al, 2016; Strunk et al, 2008). Non-use of theory is a serious issue as they are primordial to reliably inform decision making specially to inform practice. No study was identified that evaluated the use of theory with which to compare this result. Thus, need for rigorous and well evaluated research including use of theory to inform efficient decision making especially vis-avis practice. Non-differentiation of results by adolescent age stratification both in past and current studies. This may really render effective evaluation of which strategies could best work for which adolescent age population.

This result is similar to that of many studies that revealed neither ADOs stratified by their age groups nor the results (Salaam et al, 2016; Oringanje et al, 2016; Hindin et al, 2016; Kirby, 2002). This may even explain the mixed results in terms of success in some programs especially education programs which were the most common; Most studies targeting late adolescents may imply focus in efforts is on secondary prevention instead of primary which is capital in curbing adolescent pregnancy and abortion since many would have had their attitudes and beliefs formed about SRH and would have initiated sexual activity. With this approach, focus seem to be on managing consequences instead of preventing the consequences. Thus, need to involve the vital age group; early adolescents, males and programs to begin at earlier ages for

appropriate values and attitudes to be cultivated to be used during teen years (Bhalla, 2014; Doniger et al, 2010). Males generally absent for most studies implies keeping a very key stakeholder out of the resolution of the problem especially given that most ADO men view an unintended pregnancy during their teenage years as a negative event because of the adverse effect having a baby will have on their future aspirations and life goals, as well as on current freedoms as purported by (Lohan et al, 2010). This could also be explained by the fact that most programs operate from the perspective that women are contraceptive users and that men should support their partners, with insufficient attention to reaching men as contraceptive users by their own right as stipulated by Hardee et al (2017). No pre-testing of tools could lead to poor quality results collected.

All limitations in the African context were very similar to those in Cameroon and include small sample size; poor mastery of data collection tool and methods-thus poorly stated or not stated at all; most studies were institutional-based (school or hospital). In Cameroon, most studies were retrospective, non-experimental and no implications of the study given. The predominance of institution-based studies may signify insufficient awareness or unawareness of the capital role other key stakeholders especially the family play in determining the outcome of the efforts towards curbing adolescent pregnancy and abortion. Attitude formation important for healthy SRH and begins early in life especially in the family (Doninga, 2010; UNFPA, 2003). Thus, there is a need for more research in and active involvement of family and community. Very insufficient experimental studies and small sample size could imply insufficient strength of research results and difficulty to generalize results. Results from these studies may poorly inform decision making and consequently poor outcomes of efforts to curb adolescent pregnancy and abortion. This could be due to lack or insufficiency of funding and political will to support research work as supported by SOGOC; FIGO; KIT ROYAL TROPICAL INSTITUTE (2018). This study was however contrary to that of Oringanje et al (2016) whose studies revealed that studies large sample sizes. Permanent structures aimed at supporting and sustaining research and other efforts towards curbing ADO pregnancy should be established.

Limitation of Outreach Programs

Outreach programs common and frequent limitations were very similar to those of research and include non-use of theory for most studies where applicable; no differentiation of intervention and results by adolescent age stratification with some defining clearly just the age group to be sampled; most participants or those targeted were late adolescents (≥ 15 yrs) and mostly female adolescent, no blinding and no tool pre-testing for most studies. All of these are indicative of lapses in methodology which could lead to reduction in the strength and reliability of the results; consequently, possible poor outcomes of decisions based on these results. This is similar to the studies by authors who revealed methodologic problems that must be considered when making any general conclusions about the effectiveness of strategies (Oringanje et al, 2016; Strunk et al, 2008). There was however no study identified that considered the duration or ADO stratification as objective for evaluation; thus, limited study with which to compare. In the Cameroonian context, no program that met inclusion criteria was identified for Adolescent strategies.

Study Implications/Relevance

Implication for Research

- Findings of this review will enrich the evidence-based data base that can be consulted by reproductive health experts related fields and structures for valuable and reliable facts.

- This study will help evaluate the strength of the scientific evidence which will help identifying gaps in current research; generate research questions.
- The studies and programs included in this review reported outcomes in different ways and were largely based on developed/industrialized countries. There is a need to develop a uniform approach to reporting outcomes in these types of study to render comparability across studies and geographical context credible and reliable.
- There is also need for rigorous studies with their evaluation to be conducted in developing countries/low-income countries especially in Africa, particularly Cameroon to strike a balance of evidence regarding the obvious disparities in socio-cultural and economic backgrounds.

Implication for Practice (Professional)

- Results from this work will expose evidence-base successful strategies that will inform health professionals, improve evidence-base practice, to curb ADOPA.
- The results of this review suggest use a multifaceted approach with concurrent and sustained use of interventions/programs. However, there, no single, clear, and reliable answer as to the best intervention strategy to curb ADO pregnancy and abortion as analysis reveal that this is highly dependent on the outcome of interest, the setting, resources, and combination of components. Thus, generally, the evidence from this review remains inconclusive regarding best strategy to curb adolescent pregnancy and abortion, and thus could not be the basis for recommending the use or discontinuation of any of these interventions where they are already in use especially if multifaceted. There is need for more implication of male adolescents, men and parents in all intervention aimed at curbing adolescent pregnancy and abortion.

Socioeconomic and Political Implication

- The information from this study if well used, will inform policymakers, program planners, and advocates on better policies, programs, and strategies to curb the incidence of unintended pregnancies, unsafe abortions, and consequently maternal and child morbi-mortality, thereby leading to a general increase in the number of healthy women, healthy children, reduced cost and healthy economy.
- Findings of this study will help the design of strategies aimed at ADOPA and monitor the progress of programs aimed at achieving the SDG targets related to ADOPREG and maternal mortality.
- Income spent on negative consequences of adolescent pregnancies and abortions will be invested in more lucrative avenues for better productivity and economy.

Personal Implication

- Firstly, this study, successfully carried out will serve as a partial fulfillment of the requirements for the obtainment of a Doctorate degree in reproductive health, very important for my future carrier and the improvement of my standard of living.
- Provides a clearer direction and better equip researcher on doctoral work.
- As a parent and RH expert, this study will help the researcher SRH issues of my children, friends, and relatives for greater success and fulfillment of everyone.

Limitations of This Integrative Review (Potential Bias)

- All the research studies included in this review had methodologic problems that must be considered when making any general conclusions about the effectiveness of strategies.
- It is difficult to make reliable generalizations due to diverse interventions, methodologic differences, and study limitations.
- Only studies in English and French were considered, possibility for publication bias.
- Publication bias was not considered among the criteria for quality assessment of systematic review.
- Difficulty for the researchers to get access to reliable documents or contacting key stakeholders for important documents or information in Cameroon related to the research.

4.0 CONCLUSION AND RECOMMENDATIONS

Conclusion

In spite notable efforts made recently to curb adolescent pregnancy and abortion, the phenomenon and its consequences is still persistent with very high rates & specifically in sub-Saharan Africa & Cameroon. Indicative of great failure in primary prevention efforts of curbing maternal morbi-mortality, an integrative literature review on “strategies of curbing adolescent pregnancy and abortion” was carried out between the years 2000-2020. It had as purpose to create a better understanding of the adolescent strategies used to ADOPA with a general objective to determine the existing strategies used by adolescents to curb ADOPA.

As key results from data collected, 75 studies sourced from 9 electronic data bases & others were used among which primary empirical 65.3% (49), and 34.7% (26) systematic review. Most were of moderate quality & non-experimental. Based on research questions, two main strategies were identified: research and outreach programs. Research strategy components had very few themes on adolescent abortion, outcomes in Africa and Cameroon mainly primary and distal while implementation component was mostly SRE in Africa and Cameroon. Six major components/groups of outreach programs were identified constituting 26 specific programs. Most groups were complementary & multifaceted in their implementation strategic components. The components/groups ADO strategies include Sex and STIs/HIV Education Programs; Protocols for Health Clinic Appointments & Supportive Activities Programs, Service-Learning programs; Healing and Restauration Programs, collaborative approach Programs, and Child Development & Aid/Motivation Programs. Multiple strategies exist that can successfully curb ADOPA.

Key limitations of this review include difficulty accessing reliable documents or contacting key stakeholders for important documents or information in Cameroon; only studies in English and French considered, publication bias not considered among criteria for quality assessment of systematic reviews, difficulty making reliable generalizations due to variability in study population, interventions, methodologies, study limitations and limited studies without direct comparison of interventions.

Many adolescents who most need SH information & services are underserved by current research, programs, and policies. Notwithstanding, the diversity of successful high-quality interventions, implemented in diverse settings, with a diversity of study populations revealed

by this review suggests that there are multiple strategies that can be successful in curbing ADOPA. However, the variability in study populations, interventions, and outcomes of included studies, and the paucity of studies directly comparing different interventions renders difficult to make a reliable definitive conclusion on which type of approach or intervention is most effective. Ecological consideration, social determinants of health, the impacts of structural racism, inclusion of all key stakeholders, more specifically families and parents & men must be strongly considered to inform strategies/interventions/programs for efficient results. Therefore, more rigorous & high-quality research/interventions with their evaluation should be done with multicomponent combinations approach; and permanent & sustained institutions for support of ASRH projects should be established. To resolve the problems identified above, recommendations have been made as presented on the table below.

Recommendations

Table 7: Summary of Key Problems Identified and Recommendations to Their Resolution

SN ^o	PROBLEM	JUSTIFICATION	RECOMMENDATIONS	ACTOR (S)
OBJECTIVE ONE: DIFFERENT STRATEGIES TO CURB ADOPA				
1	Most empirical adolescent strategies to curb adolescent pregnancy and abortion were institution-based.	Only 2% (1) empirical studies were purely home-based with the majority being purely hospital-based with 24% (12)	-Strategies should be more home-based to involve adolescents and parents in their natural environment for effective results. -Sensitisation of the community including the family on the dangers of ADOPA and the need for their participation in research and programs.	All key stakeholders; Researchers, Adolescents, Parents, Families, policy makers, teachers, Ministry of public health and related ministries, health personnel, community, ASRH organisations etc.
2.	Great paucity of studies in all contexts on adolescent abortion, thus, unreliable information for informed decision making.	Very few studies directly addressed adolescent abortion	-Standardisation of some issues of research related to adolescent abortion across contexts. -Sensitisation of the community and families on the ampler of negative consequences associated to adolescent abortion and need for research. -State support of research, researchers, and use of research results on Ado pregnancy and abortion.	-All key stakeholders; Adolescents, Parents, Families, policy makers, teachers, health personnel, community etc.
3	Most outreach programs did not involve adolescents during their conception; thus, participation and appropriation for reliable results not guaranteed.	Almost all programs were conceived and implemented by state agencies.	Adolescents should be included in the conception and implementation of outreach programs.	All key stakeholders; Researchers, Adolescents, Parents, Families, policy makers, teachers, Ministry of public health and related ministries, health personnel, community, ASRH organisations etc.
4	Great paucity of outreach programs on prevention of ADO pregnancy and abortion in the African and Cameroon context	Very few studies were identified for adolescent abortion	-Establishment of permanent institutions that support ASRH research and interventions and support of this institutions by funders especially the state. -Designing of interesting and productive outreach programs.	All key stakeholders; Researchers, Adolescents, Parents, Families, policy makers, teachers, Ministry of public health and

			-State support of research and use of research results on Ado abortion. -Establishment and publishing of a special document guiding research on adolescent abortion. -Programs should be well designed with duration appropriate to minimize bias and encourage reliable evaluation.	related ministries, health personnel, community, ASRH organisations etc. All key stakeholders; Researchers, Adolescents, Parents, Families, policy makers, teachers, Ministry of public health and related ministries, health personnel, community, ASRH organisations etc. Researchers, funders, policy makers etc.
5	Most outreach programs had unclear statement of outcomes measured and durations were either too short or too long program, thus, reliable evaluation to inform decision making difficult.	-Most outcomes were not stated. -Some programs lasted as short as 3days while others as long as 10years.		
6	Most programs were not rigorously evaluated; thus, reliability to inform decision-making difficult.	Very few programs had inferential statistics for research results.	-Support for evaluation of programs should be given. -evaluation of programs should be done and results communicated.	

OBJECTIVE TWO: COMPONENTS OF THE DIFFERENT STRATEGIES

1	Most were primary and distal. Proximal Outcome measures (behavioural) of Adolescent pregnancy and abortion were very rare in the African and Cameroon context.	-Most studies either measured rates or knowledge.	-State support of research, researchers, and use of research results on Ado pregnancy and abortion. -Sensitisation of families on the ampleur of negative consequences associated to adolescent abortion and need for research. -Involvement of families in all stages of projects of mandates, research and programs aimed at ameliorating ASRH. Programs should be appropriately designed with provision for effective evaluation.	-Researchers, funders, policy makers, Families, community stakeholders.
2	Most outreach programs were multifaceted in their implementation strategies components making reliable evaluation and comparison of studies difficult.	Some studies had more than six (6) components with evaluation not done as per component.		Researchers, funders, policy makers, program designers.

OBJECTIVE THREE: LIMITATIONS OF THE DIFFERENT STRATEGIES

1.	All research had methodology problems and very few especially in the African context were evaluated	Most studies were rated moderate for quality	-Sensitisation on need for quality research on ADOPA -Establishment of permanent institutions that support ASRH research and interventions & support of this institutions especially the state. -Organization of seminars for capacity building quality research methodology. - Support of research projects by funders.	-All key stakeholders; Adolescents, Parents, Families, policy makers, teachers, Ministry of public health and related ministries, health personnel, community, ASRH organisations etc.
2	Frequency of publication bias for most studies and programs for effective quality evaluation	Most studies had incomplete or missing important data especially on methodology .	-Capacity building of researchers on quality of research eg seminars, symposiums etc. -Standardisation of required elements for publication of research results across contexts.	-Researchers, funders, publishers, policy makers.
3	Great paucity of experimental studies;	-Most studies in Africa & Cameroon were quasi-	-Establishment & support of permanent institutions that support ASRH research and interventions -	-Researchers, funders, policy makers.

4.	especially in Africa and Cameroon Great paucity of studies related to ADO pregnancy and abortion with which to compare results especially in the African and Cameroonian contexts.	experimental or non-experimental. -Absence of systematic review in Cameroon and only 3 identified for Africa.	Encouragement of rigorous and evaluation research by researchers. -Establishment and support of permanent institutions that support ASRH research and interventions especially the state. -Support of evaluation of research. -More systematic review studies with meta-analysis should be carried out.	-Researchers, funders, policy makers.
5	Absence of outreach programs on prevention of ADO pregnancy and abortion in the African and Cameroon context	-State support of research and use of research results on Ado abortion. -Establishment and publishing of a special document guiding research on adolescent abortion.	-Establishment and support of permanent institutions that support ASRH research and interventions and support of this institutions by funders especially the state.	Ministry of public health and related ministries, policy makers, organisations for ASRH, Families.
6	No differentiation of interventions and results by adolescent age stratification and only late Adolescents (≥ 15 yrs) targeted as samples for most research studies and outreach programs and most studies were institution-based (schools, hospitals)	Most research interventions and results were given in general adolescent terms. Very few home-based studies identified.	-Sensitisation of families on the ampleur of negative consequences associated to adolescent abortion and need for research. -Involvement of families in all stages of projects of mandates, research and programs aimed at ameliorating ASRH. -State support of research, researchers, and use of research results on ADOPA -Encouragement of Home-based studies & programs	-Researchers, funders, policy makers, Families
7	Frequency of potential Response bias	-Self-response questionnaire by ADOs and in a school context	-Encouragement of Home-based and community studies and programs	-Researchers, funders, policy makers, Families

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