

Anemia Reduction Program In Adolescents: Scoping Review

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ABSTRACT

Introduction : Anemia is a health problem that causes sufferers to experience fatigue, fatigue and lethargy. Anaemia is estimated to affect half a billion women 15–49 years of age in worldwide and in indonesia the prevalence of anemia in adolescents is 32%, This article aims to identify programs related to the treatment of anemia in adolescents, support and obstacles in the implementation of anemia reduction programs. **Method**: This article used Arshey & O'Malley Framework; selecting articles of which search flow is described through PRISMA Flowchart. **Results**: Based on 10 chosen articles, 6 articles are marked very good quality and 4 articles are marked as a good quality. Furthermore, there are 2 obtained main themes; Program Form and Barriers. **Conclusion**: The use of educational media and socialization related to anemia and its prevention for adolescents is expected to increase knowledge and awareness of adolescents about the importance of preventing anemia for adolescents.

INTRODUCTION

Anemia is a World Health problem that has a negative impact on development and in developing countries. Anemia is a strong indicator of health status and provides attention to health problems that affect infants, children, pregnant women and postpartum women as well as women and adolescents who experience menstruation. Anaemia is estimated to affect half a billion women 15–49 years of age and 269 million children 6–59 months of age worldwide. In 2019, 30% (539 million) of non-pregnant women and 37% (32 million) of pregnant women aged 15–

49 years were affected by anaemia (WHO, 2023).

Anemia is a health problem that causes sufferers to experience fatigue, fatigue and lethargy that will have an impact on creativity and productivity. Not only that, anemia also increases the susceptibility of disease in adulthood and gives birth to a generation with nutritional problems (Kemenkes RI, 2022). The previous research shows that there is a significant effect of giving Fe tablets to increase Hb levels in adolescent (Halimah Sarjiati, 2020). Young women who are anemic are at risk of becoming women of childbearing age who are anemic, then ISSN 1858-3385, E-ISSN 2549-7006 122

become an anemic mother who can experience chronic lack of energy during pregnancy later. Chronic lack of energy in pregnant women can increase the likelihood of giving birth to low birth weight (LBW) and stunting babies (Kemenkes RI, 2022).

The prevalence of anemia incidence is dominated by developing countries, most of which come from the lower middle socioeconomic class (WHO, 2020). Globally in 2019, 40% of children aged 6-59 months, 37% of pregnant women and 30% of women aged 15-49 years had anemia (Stevens et al., 2022). Nearly a quarter of the world's population or about 1.8 billion had anemia in 2019 (Safiri et al., 2021). The incidence of anemia in Indonesia is still quite high. Based on Riskesdas 2018 data, the prevalence of anemia in adolescents is 32%, meaning that 3-4 out of 10 adolescents suffer from anemia. This is influenced by the habit of non-optimal nutritional intake and lack of physical activity (Ministry of Health RI, 2022). WHO designed the framework for accelerating the decline of anemia in the world through a comprehensive approach involving cross-sector and cross-program cooperation with 5 main programs namely identifying causes and risk factors, prioritizing key prevention and intervention, optimizing cross-sector and cross-program services, strengthening cooperation, leadership, and government at

all levels and expanding research, education and innovation in anemia management (WHO, 2023).

The Indonesian government has designed a nutritious Action Movement that aims to increase awareness of you, your friends and all school residents about fulfilling nutrition for teenagers including physical activity, eating together and consuming blood-adding tablets (Fe Tablets) for teenage girls (Kemenkes RI, 2022). This movement proved effective in (1) increasing knowledge about nutrition before and after the intervention; (2) increasing the proportion of all adolescents having a positive attitude towards Fe tablets and rematri who consume Fe tablets every week; (3) an increase in adolescents who did 60 minutes of physical activity/day and consumed fruits and vegetables after the intervention; and (4) the proportion of adolescent girls who consumed weekly fe tablets was 12 times more likely to increase after the intervention (Ministry of Health, 2022).

This Scoping review aims to identify programs related to the treatment of anemia in adolescents, identify support and obstacles in the implementation of anemia reduction programs in the world. This study is expected to provide significant value to policies and programs so as to increase the knowledge, awareness, and participation of adolescents in anemia prevention programs.

METHODS AND MATERIALS

This research article is an article that uses literature review to identify research articles that are in accordance with the research objectives with reference to the Arkshey & O'malley framework (Peters et al., 2017).

Literature review in this study aims to map the evidence and identify differences between research results. Researchers use the PEO (population, exposure and outcome) framework to assist in the search for research articles, determine inclusion and exclusion criteria and also identify appropriate research articles.

Table 1. Framework PEO

Framework	Keywords
Population	Adolescent, Teenagers,
Exposure	Anaemia
	Prevention
	Causes
Outcomes	Program
	Challenges

Based on the above PEO framework, the researchers identified the research question in this scoping review is “how does the program reduce the incidence of anemia in adolescents in the world?”.

In identifying research articles that are in accordance with the questions and research objectives, the author of the article identifies several strategic steps in the search for suitable articles, namely determining the criteria for inclusion and exclusion, the use of medical subject heading (MeSH), the use of truncation, the Volume 22 Number 1, Februari 2024

use of Boolean operators (OR, AND, and NOT) and pay attention to the use of articles in british English and American English.

Table 2. Keywords

Population	Exposure	Outcomes
Adolescen*		Prevention OR
OR Teen*	Anaemia	Causes OR
OR You* OR	AND	Program OR
Teenager*		Challenges
AND		

The inclusion criteria of articles in this study include research articles published in 2017-2022, research articles from Gray literature and supporting official sites, articles using Indonesian and English, research articles aimed at identifying programs to reduce and prevent anemia in countries in the world, identifying support and obstacles in the implementation of anemia reduction programs in the world. The article exclusion criteria in this study are articles from guidebooks, standard operating procedures, research articles that do not use Indonesian and/ or English as well as research articles that focus on the prevalence of anemia in adolescents.

The databases used in scoping this review are Pubmed, ScienceDirect, Wiley Online Library, and Proquest and use gray literature through Google Scholar and several official supporting sites.

RESULTS

In the documentation of this research article using Preferred Reporting Items for Systematic Reviews and Meta-analysis

Flowcharts (PRISMA) (Tricco et al., 2018) in documenting article searches.

Assessment of the quality of articles as many as 10 articles of research conducted assessment of the quality of articles using mixed methods appraisal tools (MMAT). On the assessment related to the quality of research articles, the authors found that 6 articles of very good quality (a2, a3, a4, A6, A9, A10) and 5 articles of good quality (A1, A5, A7, A8).

1. Characteristics of research articles by Country

Based on the results of the critical appraisal of 10 articles that have been selected, the entire article contains research conducted in developing countries, including India (a2,a3,A9,A10), Indonesia (A5,A6,A7), Ghana (A8), Malaysia (A1), and Yemen (A4).

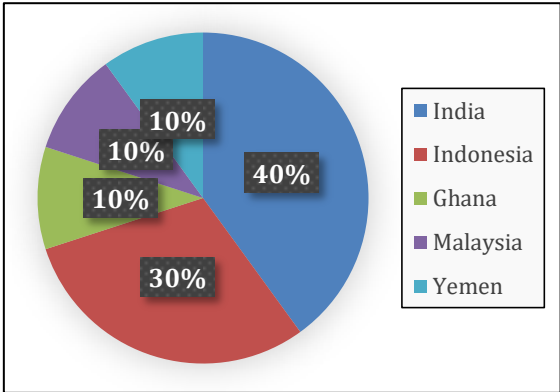


Figure 1. Article based on Country

2. Characteristics of research articles by type of research

Based on the results of the critical appraisal of 10 articles that have been

selected, as many as 9 articles using quantitative non-randomized study (a1, a2, a3, a4, A5, A6, A7, A8, A10), and 1 article using mixed-method study (A9).

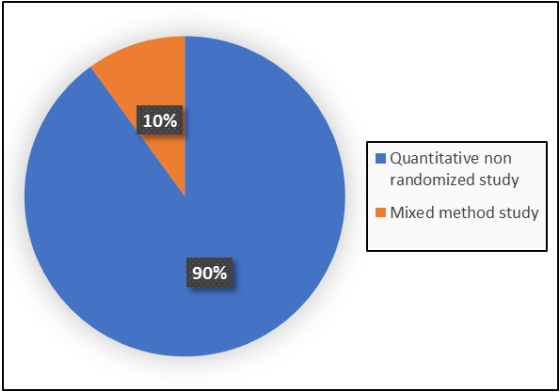


Figure 2. Article Based on Study Design

3. Characteristics of research articles based on the quality of research articles

Based on the quality of the articles that have been done critical appraisal, obtained a number of 6 articles of very good quality (a2, a3, a4, A6, A9, A10), and 4 articles with good quality (A1, A5, A7, A8).

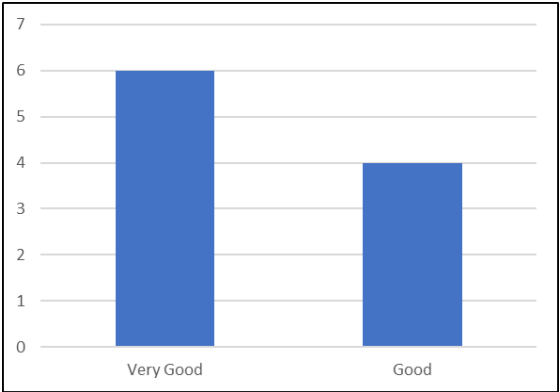


Figure 3. Article based Quality

DISCUSSION

The results of the analysis of the corresponding article that has been through the analysis of the article, data extraction and assessment of the quality of research

articles then identified the theme findings in this scoping review include:

1. Program Form

After mapping the theme based on the article that has been selected, the results were found in the form of several forms of programs related to the treatment of anemia in adolescents, including the provision of weekly blood tablets, supplementary feeding and modification and monitoring of Adolescent Health.

A. Weekly blood supplement tablets

The government has taken steps in an effort to prevent anemia in adolescent girls through the distribution of tablets added Blood (fe tablets). The administration of blood-adding tablets to adolescent girls aged 12-18 years is carried out through UKS/M at educational institutions (junior and senior high schools or equivalent) by determining the day of taking blood-adding tablets together every week according to agreement (Widiastuti & Rusmini, 2019). In addition, for the success of this program, the involvement of support from teachers is also needed to improve compliance with the consumption of blood-added tablets (Fitriana & Pramardika, 2019). For adolescent girls, it is recommended to take blood-adding tablets regularly at a dose of 1 tablet every week and 1 tablet every day during menstruation (Widiastuti & Rusmini,

2019). Add Blood tablets have a composition of 60 mg of elemental iron (ferrous sulfate, ferrous fumarate or ferrous gloconate preparations) and 0.4 mg of folic acid (Nurjanah & Azinar, 2023).

B. Food additives and modifications

Treatment of anemia in adolescent girls can be done by providing proper nutrition as needed (Kamaruddin et al., 2019). There are various kinds of additional food modifications that can be consumed by young women as a form of anemia treatment. The modification of foods including the innovative food fortification and biofortification procedurs used to improve the iron content in staple food crops (Liberal et al., 2020). The main factors that influence the formation of red blood cells are iron and protein(Nugroho et al., 2023). Fish is one source of protein that has many benefits and is rich in nutrients. Additional feeding in the form of mackerel Nuggets as much as 50 grams/day for 1 month can be applied in the diet of adolescent girls as a form of handling anemia (Nugroho et al., 2023). In addition, tolo beans are commonly found throughout Indonesia which can be processed into tolo bean flour as an ingredient in making cookies that contain a lot of iron in it (Rauf et al., 2022). In addition, research conducted (Kamaruddin et al., 2019) obtained results namely, cookie products made from 50% amaranth

flour and 50% chicken liver flour are acceptable and used as an alternative snack to prevent anemia in adolescent girls.

C. Adolescent Health Monitoring

Complex adolescent health problems require a comprehensive and integrated treatment that involves all elements of the cross-program and cross-sector (Ertiana et al., 2019). Then, collaborative efforts with village social groups such as karang taruna and posyandu cadres are breakthrough efforts that can be done as a form of anemia prevention programs for young women (Apriningsih et al., 2023). The implementation of Posyandu adolescents using a 5-Table system consisting of (1) registration, (2) measurement (weight weighing, height measurement, blood pressure measurement, upper arm circumference measurement, anemia checking), (3) recording, (4) health services (counseling according to problems experienced by adolescents, giving blood or vitamin tablets), and (5) counselling (counseling, film screenings, book review; skill development such as handicraft making skills and entrepreneurial skills) (Ertiana et al., 2019). Posyandu teen activities can increase knowledge about adolescent health (Wahid et al., 2020).

2. Barriers

A. Knowledge

The adolescent age group is a strategic target group that is in the learning process so that it is easy to absorb knowledge (Syakir, 2018). Young women have less anemia knowledge related to the selection of foods that contain iron, foods that are helpful and foods that inhibit iron absorption in the body (Fitriana & Pramardika, 2019). The results of the (Simanungkalit et al., 2019) study found that adolescent girls with knowledge of anemia who were less at risk were 3.3 times more likely to experience anemia. Meanwhile, young women who have good knowledge about anemia will tend to meet their food consumption and nutritional needs to avoid anemia problems (R. N. Sari et al., 2022). Knowledge about nutrition is needed by young women, which information can be obtained both from schools and the mass media (Sab'ngatun & Riawati, 2021). If young women experience anemia, it will have an impact on decreased immunity, concentration, learning achievement, adolescent fitness and productivity for young women (Sri & Putri, 2022). In addition, poor knowledge of anemia is one of the causes of unsupportive behavior in the Prevention of anemia during menstruation, because students do not understand or only receive information that is not comprehensive (Mularsih, 2017).

B. Behavior

Social changes and increasingly modern lifestyles in society tend to increase various problems in the quality of life of adolescent girls who are at risk for health (Irnawati et al., 2019). The intention to prevent anemia is one of the early forms of Health Behavior formation (P. Sari, 2020). Lack of motivation and low awareness of adolescent girls result in the ability or behavior in preventing anemia is also low (Hashim et al., 2018). A person's knowledge affects the prevention behavior of anemia during menstruation (Mularsih, 2017). So that young women need motivation, which is closely related to behavior as the generation of forces that encourage or attract someone so that their behavior is directed at achieving goals (Noer et al., 2017). The results of the previous study found that all students had received blood supplement packages for free, but not all students spent their blood supplement tablets due to nausea and dislike of the smell or taste of the blood supplement tablets (Widiastuti & Rusmini, 2019). In fact, there is a significant relationship between compliance with the consumption of tablets added blood with the incidence of anemia in adolescent girls, that the more compliant in consuming tablets added blood then the levels of HB adolescent girls will increase (Savitri et al., 2021). The community empowerment increase opportunities, participation, and access to health services of women in their

household and community (Aprillia et al., 2023).

C. Characteristics of adolescents

Adolescent girls need more iron to replace iron lost during menstruation (Nofianti et al., 2021). In addition, rapid growth in adolescence requires the intake of macronutrients and micronutrients in large quantities for the formation of new cells throughout the tissue, especially muscle, bones and reproductive organs, causing adolescent girls 10 times more at risk of anemia than adolescent boys (R. P. Sari et al., 2023). Thus, continuous efforts are needed to improve the knowledge, attitudes, and behaviors of adolescents regarding good nutrition (Ertiana et al., 2019).

CONCLUSIONS AND SUGGESTIONS

Based on the analysis of the 10 eligible articles in this study, it can be seen that there is a program in the treatment of anemia for adolescents including the administration of blood-added tablets, food fortification, and health monitoring for adolescents. Obstacles in the implementation of anemia treatment programs in adolescents found is the limited knowledge, obstacles in behavior change, including the characteristics of adolescents. The use of educational media in education and socialization related to anemia and its prevention for adolescents is expected to increase knowledge and

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awareness of adolescents about the importance of preventing anemia for adolescents.

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Attachment

No	Penulis/ Tahun	Judul	Tujuan	Metode	Hasil
A1	(Wong et al., 2022)	<i>Knowledge and practices in preventing nutritional anaemia of the urban poor adolescents in Kuala Lumpur, Malaysia</i>	This study aims to identify anemia prevention practices in suburban adolescents in Kuala Lumpur, Malaysia	This study was a quantitative study in 209 suburban adolescents aged 10-17 years. Anemia Status measured using HemoCue & hemoglobinometer	The prevalence of anemia in peripheral adolescents ranged from 58.4% with the highest incidence in adolescent girls ($p<0.001$) and families with family members >6 or more ($p=0.036$). The results of this study indicate the prevalence of anemia and the low level of knowledge and practice of anemia prevention in peripheral adolescents is necessary to improve the status of anemia in peripheral adolescents.
A2	(Wangas kar et al., 2021)	<i>Prevalence of anaemia and compliance to weekly iron-folic acid supplementation programme amongst adolescents in selected schools of urban Puducherry, India.</i>	This study aims to identify the prevalence and proportion of anemia in schools in Puducherry	This study was a cross-sectional study in adolescents aged 10-18 years. Data were taken using semi-structure questionnaire and measurement of haemoglobin measured using digital haemoglobinometer	The prevalence of anemia ranged from 62.7% (95% [CI]: 58.2-67.0). The proportion of mild anemia was 27.3%, moderate anemia was 32.5%, and severe anemia was 2.8%. Late adolescence has a higher risk of developing anemia (1.7 95% CI: 1.0-3.0) than early adolescence.
A3	(Sarna et al., 2020)	<i>Prevalence and Predictors of anaemia among Adolescents in Bihar and Uttar Pradesh, India</i>	This study aims to assess the prevalence and prevention programs of anemia in children and adolescents in india	This study is a cross-sectional study on secondary data on 10,350 adolescents aged 10-19 years in india with a multi-stage systematic sampling method.	The results of this study indicate that anemia is more common in adolescents who come from suburban areas than urban areas. The administration of blood supplement tablets in anemia in adolescents is not only limited to adolescent girls.

No	Penulis/ Tahun	Judul	Tujuan	Metode	Hasil
A4	(Hodeida et al., 2022)	Prevalence and Correlates of Anemia among Adolescents Living in Hodeida, Yemen.	This study aims to assess the benefits of nutrition education to changes in Hb levels in adolescents	This study was a cross-sectional study in 400 adolescents aged 15-19 years taken at random. This study consisted of a control group (Administration of Fe tablets) and an intervention group (Administration of Fe tablets and nutrition education).	The prevalence of anemia is 37.8%. The causes of anemia are female, excessive menstruation and experiencing headaches, fatigue, or dizziness. Adolescents who are still in school, consume additional food, often wash their hands have been shown to have a low risk of anemia.
A5	(Andriastuti et al., 2020)	Prevalence of anemia and iron profile among children and adolescent with low socio-economic status	This study aims to assess the prevalence of anemia in children and adolescents in areas with low socioeconomic	This study is a cross-sectional study in 2 schools on the outskirts of Jakarta conducted on children and adolescents aged 6-18 years.	The prevalence of anemia ranges between 14%. As for the prevalence of iron deficiency anemia 5.8%, iron deficiency without anemia 18.4%, iron deficiency 4.3%. The female group is more at risk of developing iron deficiency anemia and iron deficiency.
A6	(Gasong et al., 2022)	Formulation and Effect of Iron Fortified Instant Bose Corn on Addressing Anemia among Adolescent Girls in Kupang, Indonesia	This study aims to develop corn fortifies to prevent anemia in adolescent girls	This study is a pre-post controlled design study consisting of 2 stages, namely the formulation stage and the intervention stage. In the formulation stage, this was done in the IPB laboratory and in the second stage the intervention was carried out on high school students in Kupang.	The results of this study showed that Fe-fortified instant Bose corn (IBC) was effective in preventing anemia in adolescent girls in Kupang, Indonesia.
A7	(Alfiah et al., 2020)	Coverage and Adherence of Weekly Iron Folic Acid Supplementati on among School going Adolescent Girls in Indonesia	This study aims to assess the scope of administration of blood enhancement tablets in adolescent girls.	This study is a cross-sectional study in East Java and East nusa tenggara in 2018 as many as 60 high schools with a total of 1,856 respondents with an average age of 17 years.	This study showed that the average adolescent received 0.4-1.4 tablets plus blood and the average adolescent who tablets the average consumption of tablets plus blood 0.4-0.7 tablets plus blood in the last 6 months. The final result of this study shows that the coverage of weekly consumption of blood supplement tablets in adolescents in East Java and NTT is still low.

No	Penulis/ Tahun	Judul	Tujuan	Metode	Hasil
A8	(Gosdin et al., 2020)	Barriers to and Facilitators of Iron and Folic Acid Supplementati on within a School-Based Integrated Nutrition and Health Promotion Program among Ghanaian Adolescent Girls	This study aims to evaluate barriers and support in school-based anemia prevention programs by administering blood and folic acid supplement tablets.	This study is a longitudinal cross-sectional study that conducted weekly observations on 1,387 adolescent girls in northern ghana.	As many as 90% of adolescents consume blood supplement tablets and about 56% of them consume blood supplement tablets for more than 15 weeks. The blood donation Program in ghana has experienced many obstacles but efforts have been made such as Health Promotion, Health Training, maximizing the distribution of blood donation tablets. The strengthening of health education among students provides positive benefits.
A9	(Khapre et al., 2020)	Understanding barriers in implementation and scaling up WIFS from providers perspective: A mixed-method study, Rishikesh, India	This study aims to assess the implementation and scope of the administration of blood enhancement tablets in adolescents in india	This study is a sequential exploratory mixed method study in adolescents aged 10-19 years by using cluster sampling techniques in sampling research.	The results of this study showed that 90% of adolescents who were sampled in the study had anemia. This study recommends the need for adolescent health monitoring, especially with regard to examination related to anemia in adolescents.
A10	(Bali & Alok, 2022)	Is ignorance of the weekly iron and folic acid scheme among adolescents the deciding factor for its suboptimal utilization and ineffectiveness ? A cross sectional study	This study aims to assess the knowledge of adolescents about giving tablets added blood that should be taken every week	This study is a cross-sectional study on 3 regions in india. 3213 samples in this study were taken using multistage stratified random sampling technique	The results of this study showed that good knowledge about the consumption of tablets added blood every week influenced by gender, region of residence, sources of Information, economic status, knowledge of anemia, as well as remaya who consume tablets added blood >4. The existence of a health program that not only focuses on women, because of the results of this study teenage boys have less knowledge related to the consumption of tablets added blood and anemia in adolescents.

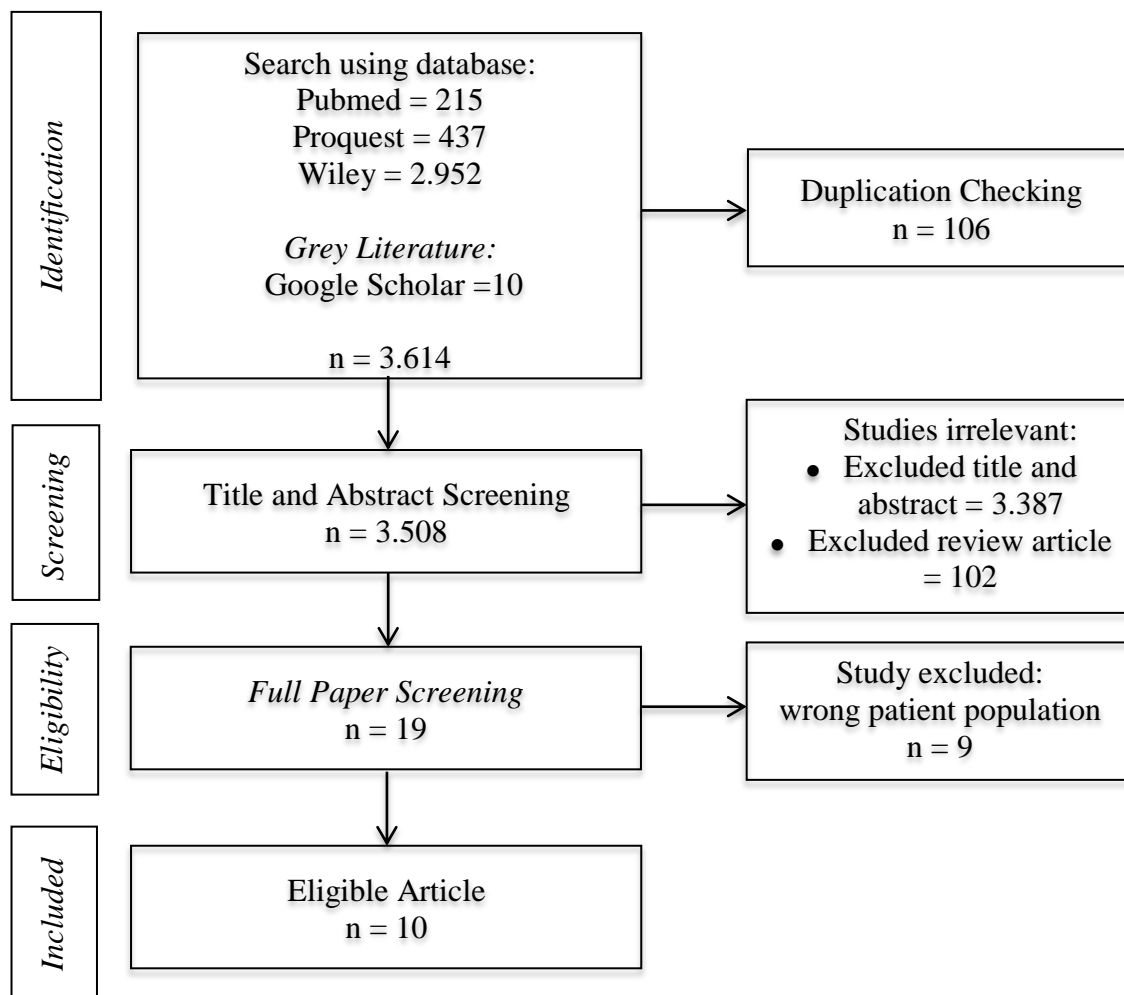


Figure 1. *PRISMA Flow Chart*