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# **Evolution of Research on School-Based Suicide Prevention Programs: Publication Trends and Emerging Topics (2000-2023)**

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#### **Abstract:**

In the recent years, the suicidal cases have been increasing significantly. The high prevalence of suicidal action is observable in adolescents. The programs of suicidal action prevention at schools and higher education become very important to teach because they could suppress the case. This research analyzed the school-based program with the bibliometric method. This research used the bibliometric with the assistance of Vos Viewer version 1.6.19. The researchers also used the search engines, such as Pubmed and crossref. The analysis of the publication distribution showed 115 articles from two search engines. Crossref had more articles than Pubmed. The researchers found five clusters such as suicide prevention, suicide prevention programs, schools, articles, and health care system. Based on the research, the results contribute to the future research development and reference about the preventive program to apply by the future research.

Keywords: School, Suicide Prevention Program Suicide, Bibliometric

#### **Introduction:**

Suicidal action becomes the most extreme state of a mental health crisis. Most suicidal actions are committed by adolescents such as learners or students. Suicidal action refers to an act of ending a personal life due to high psychological stress or pressure. Suicidal action may occur in early adulthood and adolescent period. However, many previously found adolescents committed suicidal actions (Johansson et al., 2006); (Sarfo et al., 2023); (Abozaid et al., 2022). Suicidal action is the second cause of death for adolescents. This matter also becomes a critical problem of the community

(Steck et al., 2018); (Grande et al., 2021)). The increment indicates the mental health problems of the young generation (McManus et al., 2019).

In the recent years, the suicidal cases have been increasing significantly. Research of 433.000 students from 82 universities in Japan reported high suicidal action with he prevalence of 17.6% from April 2020 to March 2021. The percentage was the highest in the six months (Fuse-Nagase et al., 2021). A study in the United States of America found the prevalence of suicidal cases in 2021 was higher by 4% than in the previous year, 2020

(Curtin et al., 2022). On the other hand, the data of National Criminal Information Center (Pusiknas) of the Indonesian National Police (Polri), showed the prevalence of 971 suicidal cases from January to October 18, 2023. The highest prevalence was observable in Central Java. The increased suicide prevalence in various countries become the focus of all parties. Suicidal actions on adolescents become the problems of community mental health in various countries (Hu et al., 2023).

Based on the data, 700.000 individuals died due to committing suicide. The prevalence indicates an individual out of 100 individuals, 1.3%, die due to committing suicide. Suicidal action is the fourth death cause of individuals aged between 15 and 29 years old and occurs in most countries with low or moderate incomes (World Health Organization, 2022). High suicidal actions in adolescents or learners should not be ignored. Learners are the future of a nation. Thus, their mental health states must receive proper management to develop the national future. However, the reality shows that high physical, emotional, and social pressures on adolescents may increase the risk of committing suicide.

Some influential factors in suicidal action such as self-identity exploration of adolescents, the effort of self-identity exploration, and the environment (Potterton et al., 2020). However, on the other side, some other influential factors are high stress and external pressure. Family and social economy factors also contribute to suicidal actions of adolescents (Steck et al., 2018). Internal and external self-adaptations simultaneously influence adolescents' emotional the regulations. Adolescents with low emotional management capability may develop certain psychopathological situations (Delios et al., 2023); (Swee et al., 2020). Besides that, adolescents with narrow or impulsive mindsets may also have short reasoning capability to make decisions.

The causes of death due to suicidal actions are complicated and involve various biological, clinical, sociological, and environmental problems (Favril et al., 2023). Many influential aspects are risky from suicidal actions, such as social-economy conditions and comorbid diseases (El-kholy et al., 2023), alcohol abuse (Ibrahim et al., 2022), child sexual harassment (Sehlo et al., 2022); (Shoib et al., 2022), the stigma against assistance seeking (Ohayi, 2019), the hindrance of accessing health care service (Cecchin et al., 2022), the access of committing suicide (Azizi et al., 2022). Besides that, media also have important roles to strengthen and weaken the efforts of committing suicide (https://www.who.int/news-room/fact-

sheets/detail/adolescent-mental-health).

Many previous studies on adolescents, learners, or students applied qualitative approach, for example (Urme et al., 2022)(Zhang, 2023) (Vélez-Grau et al., 2023); some other applied quantitative approaches such as (Alotaibi & Mukred, 2022); some other researches applied mix methods (Anny Chen et al., 2020); and some researches applied systematic review and meta-analysis (Mazumder et al., 2022)(Bruno et al., 2023)(Rafiei et al., 2023). Some related strategies such as the efforts of suicidal action prevention are also available, such as by (Azizi et al., 2022), However, no specific study about suicidal action prevention based on school programs with bibliometrics is available.

The programs of suicide action prevention at schools and higher education become very important to teach because they could suppress the case. Suicidal actions are serious problems so the programs attempt to prevent the action committed by learners or students. Besides that, the suicide prevention program could also improve the awareness of suicidal indications and risks. A preventive program could provide resources of support for individuals with risks and are influenced by committing suicidal actions. Examples of the programs include counseling and community welfare improvement.

Preventive suicidal actions at schools are an important component of dealing with the mental health anxiety of adolescents and suicidal actions. The preventive efforts are useful to identify the learners with risks and create a supportive

environment and encouraging-transparent dialog about mental health.

The researchers attempted to review research trends about school-based suicide prevention programs. This research analyzed: 1). Trend of publications related to the topic of early childhood care in the range of 2000-2023. 2). Research topics that have developed in the period 2000-2023.

#### **Methods**

The researchers applied the bibliometric analysis with the assistance of VOS viewer 1.6.19. This research used the search engines of PubMed and crossref with open access capability. The applied

keywords were school-based suicide prevention programs. The inclusion criteria were the research articles published from 2000 to 2023 to determine the milestone theory for the recent 23 years and to determine the novelty of the research period, the recent 23 years. The researchers took the data on October 15, 2023. The researchers used the following paths: a) collecting the data from Publish or Perish, b) screening the data and filtering the data, c) analyzing the data, d) displaying the results and findings, and e) discussing and drawing a conclusion (Dede & Ozdemir, 2022).

The detailed data collection stages appear in table 1 below.

**Table 1. The Flow of Data Collecting Process** 

Stage	Description	Results
1	The Data Collecting Process	Research on School-Based Suicide Prevention Program from 2000-20023
2	Screening the data and filtering the data,	"suicide" and "prevention" and "school"
3	Analyzing the data	Documents containing the words "suicide", "prevention", and "school" in the Crossref and PubMed databases (1115 articles).
4	Displaying the results and findings	Five clusters, 147 items, 7119 links, and 24515 strength of total links. The five clusters were suicide prevention, school, suicide prevention program, systematic review, and health care system.
5		Discussing and drawing a conclusion

## Result and Discussion: Trend publication:

The analysis of the publication distribution obtained a total of 1115 articles from two search engines, Crossref and PubMed. Crossref had more articles than Pubmed. The researchers found citations about 6232 citations from crossref and no citations from PubMed. Based on the publication years, from 2000 to 2023, the researchers found the annual research publication fluctuated amount from 8 to 144 articles. The highest article publication was observable in 2009, consisting of

123 articles; in 2021, the number of published articles was 144 articles; and in 2022, the number of articles was 133.

In 208, a global incident occurred, the economic crisis. This problem occurred due to the global economic recession and was subjected to be the cause of suicidal action (Sinyor et al., 2023). Eurofond explains that the global incident, such as the economic incident in 2007, brings a significant influence on various individual life aspects and jobs (Chatrakul Na Ayudhya et al., 2019; Frasquilho et al., 2016; Mucci et al., 2016) and

suicidal action (Alicandro et al., 2019; Matsubayashi et al., 2020; Sinyor et al., 2023). In 2020, the world encountered the COVID-19 pandemic. The impacts of COVID-19 burdened the economic situation and psychosocial matters. The pandemic made the community suffer from acculturative stress (Buitron et al., 2023; English et al., 2022; Liu et al., 2023).

Role changes, decreased social interaction, and job loss are vulnerabilities for men. The problems also influenced the mental states of males, such as depression (Guerra & Eboreime, 2021; Wahyuni et al., 2019; Zhu et al., 2023). Based on the interpersonal psychology of committing suicide, Joiner explains the "feeling of failing" and "the feeling of burden" as the initial states of having suicidal ideas (Stevenson & Wakefield, 2021). The economic recession influenced the high prevalence

of suicide prevalence (Alicandro et al., 2019). This condition becomes a concern to determine the further impacts of economic recession. Thus, the condition is correlated to the number of published articles. In India, in 2010, the prevalence of suicidal the highest in the action was (https://www.bbc.com/indonesia/majalah/2012/06 /120622 indiasuicide). In India, in 2016, the estimation of suicidal action was 230.314. The prevalence represented the percentage of 28% of global suicidal cases. A percentage of 37% of cases was observable in females at the global level and 24% was from male-suicidal actions in India (Arya et al., 2023).

The lowest article was observable in 2002, only with 8 articles; and 2018 with 13 articles. However, in 2019, the prevalence occurred significantly to 62. Figure 1 shows the results based on the publication trend from 2000 to 2023.

**Table 2. The Annual Article Number** 

The Year	Numbers of Publications
2000	15
2001	15
2002	8
2003	16
2004	17
2005	19
2006	23
2007	37
2008	40
2009	121
2010	38
2011	31
2012	22
2013	52
2014	51
2015	38
2016	66
2017	39
2018	45
2019	77
2020	37
2021	144
2022	133
2023	41

Figure 1 shows the publication trend for the last 23 years.

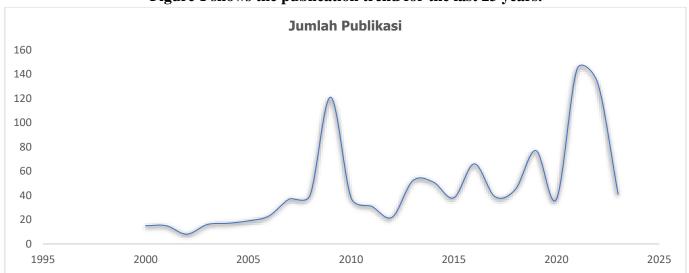


Figure 1. The publications from 2000 to 2023

The researchers also analyzed the number of citations. The results showed 223 citations from some articles, such as by Dianne Neumark-Sztainer, Mary Story, Peter J Hannan, and Jeanna Rex. The second frequently cited is from G. Issacson with 218 citations from the articles. The top third cited article is from Katalin Szanto, Sandor Kalmar, Herbert Hendin, Zoltan Rihmer,

and J. John Mann with 149 articles. The frequently cited articles showed that the research influenced science development. The citation analysis is useful for finding out the impact, influence, and quality of scientific articles based on the citations (Arsyad et al., 2018; Caon et al., 2020; Krismayani, 2021). The data from the citations are based on the complete names. Table 2 shows the results.

**Table 3. The Number of Frequently Cited Articles.** 

Numbers of the Citation	ons Researcher Names	
223	Dianne Neumark-Sztainer, Mary Story, Peter J Hannan, Jeanna Rex	
218	G. Isacsson	
149	Katalin Szanto, Sandor Kalmar, Herbert Hendin, Zoltan Rihmer, J. John Mann	
140	Li Yan Wang, Quanhe Yang, Richard Lowry, Howell Wechsler	
131	Abigail A. Fagan, Sharon Mihalic	
121	Christine Moutier, William Norcross, Pam Jong, Marc Norman, Brittany Kirby,	
	Tara McGuire, Sidney Zisook	
97	Elizabeth A. Schilling, Robert H. Aseltine, Amy James	
87	David N. Miller, Tanya L. Eckert, James J. Mazza	
85	Jorgen Gullestrup, Belinda Lequertier, Graham Martin	
84	Tanya L. Tompkins, Jody Witt	

The authors of the articles are varied from 1 to 99. Collaborative research with large researcher participation could influence credibility and provide high impacts (Abramo & D'Angelo, 2015; Razzaq et al., 2022). Wutchy et al also found that the written articles with the college would have high citation frequency compared to individually written articles (Abramo & D'Angelo, 2015). The researchers had various considerations related to the complexity, such as various science disciplines,

the competence of every researcher and culture, and the inter-disciplinary experience and demand with certain themes (He et al., 2009).

#### Research topics that have evolved:

Based on Network visualization (Figure 2) by applied keyword of 'suicide school-based prevention program, the researchers found five clusters, 147 items, 7119 links, and 24515 strength of total links. The five clusters were suicide

prevention, school, suicide prevention program, systematic review, and health care system. Specifically, in the first cluster, the researchers found 58 items; the second cluster with 47 items; the third cluster with 19 items, the fourth cluster with 18 items, and the fifth cluster with 5 items.

The content of the first cluster, suicide prevention, consisted of abstract, addition, group age, behavior, trust, case, client, chapter, context, country, culture, death, Europe, example, female, field, focus, gender, history, importance, individual, influence, life, male, management, mean, medium, mental health problem, country with moderate income, order, overview, patience, wisdom, population, practice, perspective, psychiatric problem, reason, region, relationship, researcher, role, substance abuse, behavior, suicidal prevention, mean of suicidal action, text, treatment, understanding, method, female, world, and WHO.

The second cluster deals with adolescents, suicidal actions of adolescents, anxiety, Australia, baseline, behavior, cluster, group control, depression symptom, efficacy, end, evaluation, face, further research, grade, assistance, senior high school, senior high school learners, internet, cognition, month, parent, participant, preventive program, primary outcome, program, randomized control, reduction, referral, sample, scale, school, school setting, school staff, personal, self-harm, skill, source, learners, suicidal idea, survey, total,

training, trial, week, and adolescent suicidal prevention.

The content of the third cluster is Hindrance, Canada, challenge, creation, effort, group focus, interview, lack, obesity prevention program, participation, perception, qualitative study, school personnel, school, preventive program at school, teachers, America, and adolescent suicidal action. The fourth cluster, systematic review, consisted of the author, clinic, combination, contact, date, day, goalkeeper, interest, positive impact, postinvention, restriction, September, suicidal death, suicidal preventive program, suicidal preventive strategy, and systematic review. The fifth cluster discussed the health care system: features, characteristics, difficulty, health care system, review, and suicidal risk. The health care system consisted of research about individual correlation.

The first cluster, suicide prevention, consisted of some research with high intensity, such as abstract consideration, person, and chapter. In the second cluster, the suicide prevention program consisted of research about hindrances and efforts. In the third cluster, the school consisted of research with discussions about programs, preventive programs, and implementation of learners or adolescents as the subjects. In the fourth cluster, about suicide prevention and school; and in the fifth cluster, the health care system, the researchers found research about suicidal risk.

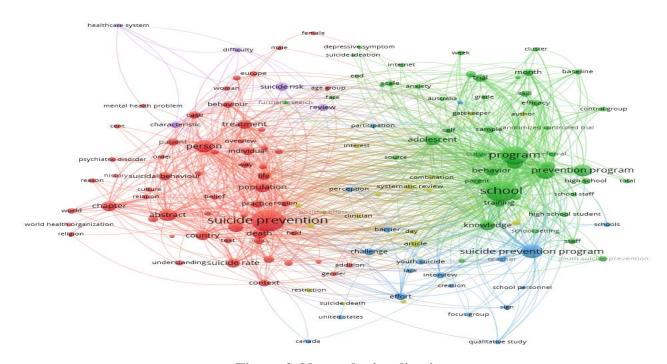


Figure 2. Network visualization

The researchers labeled the previous study with dark purple for those published in 2014, among others suicide prevention program, school, prevention program. The yellow color indicates the developing research and the ongoing research for

those published in 2018, among others health care system, suicide risk. Therefore, the yellow-light color shows the novelty of the promoted research (Al Husaeni & Nandiyanto, 2022; Nandiyanto & Al Husaeni, 2022) as show in Figure 3.

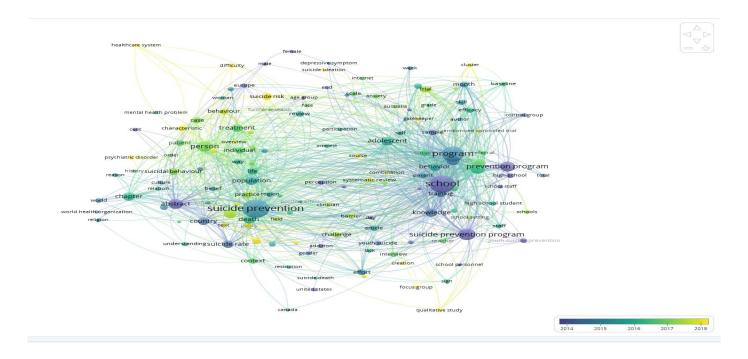


Figure 3. Overlay visualization

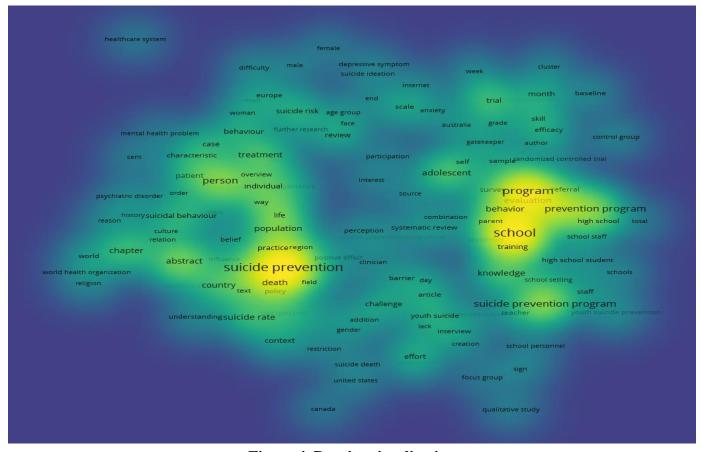


Figure 4. Density visualization

The results about the density level (figure 4) show the opportunity to promote future research about suicidal prevention with the implementation of school programs. Canada (Exner-Cortens et al., 2022; Kutcher et al., 2017) and America (Breux et al., 2017) are advanced countries with the implementation of suicide prevention. However, low or moderate-income countries rarely promote the research. Therefore, Indonesia still has the broad opportunity to develop the research. The results also found that the applied training program could prevent suicidal actions and improve about suicidal awareness actions among adolescents. Therefore, future researchers could apply different methods, such as workshops to prevent suicidal actions in adolescents.

The other findings were the dominating research with a qualitative approach and experimental design with control groups. In the other research, the researchers found the implementation of quantitative, mixed method, and research & development approaches. (Fowler et al., 2023; Susan & Forster, 2012) also researched females committing suicide. However, research about males committing suicide is limited. (Grossberg & Rice, 2023; Ribeiro et al., 2018; Roca et al., 2019) Conducted research about the idea of committing suicide due to depression symptoms. This topic could be an opportunity to develop research about psychiatric problems. Researchers about the implementation of the Internet are many but this topic still provides various gaps for further Internet-based program development (Herruzo et al., 2023; Sedgwick et al., 2019).

#### **Conclusion:**

Schools or higher education have important roles in preventing suicidal actions. The school-based suicidal preventive program requires a comprehensive method. Various intervention programs are applicable for public or specific purposes. Research about suicide prevention with school-based suicide programs could be an interesting theme for further development. In this research, the researchers found five clusters:

suicide prevention, suicide prevention programs, schools, systematic review, and a healthy care system. Based on the research, the results contribute to future research development and reference about the preventive program to apply by the future research.

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