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School-based Interventions to Improve Adolescent Resilience: A Scoping Review

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Abstract

BACKGROUND: Resilience can help adolescents to have positive adaptations in dealing with difficulties, stress, and trauma, as well as preventing mental disorders. School-based resilience improvement programs have been implemented internationally. However, there has been no specific review to examine the effectiveness of the application of resilience programs in adolescents.

AIM: This review aimed to analyze the effectiveness of school-based interventions to increase resilience in adolescents.

METHODS: Search articles using three electronic databases, namely CINAHL Ebsco, PubMed, and ProQuest. The keywords used are "resilience or resilient" AND "adolescents or teenagers or young adults" AND "school-based intervention or classroom-based intervention or teacher implemented." There are 1206 research articles from 2014 to 2020, but only nine randomized controlled trials (RCT) studies match the inclusion criteria for analysis.

RESULTS: Findings show that five school-based intervention programs have a significant effect on adolescent resilience levels, namely: enhancing resiliency among students experiencing-stress-prosocial, mindfulness training with learning to BREATH (mindfulness-based programs stress reduction), resilience and coping intervention (RCI), and girls first resilience curriculum. The shortest program duration is RCI, 3 weeks, while the most extended time is Girls first for 5 months. The duration of the program had no significant effect on increasing resilience.

CONCLUSION: These findings encourage further research and development of school-based intervention programs to increase resilience in adolescents, especially in developing countries such as Indonesia.

Introduction

Adolescents represent more than 16% of the world's population, which means 1 in 6 people is currently 10–19 years old [1]. Adolescence is a critical life stage and focuses on learning, exploration, self-discovery, and relationship building [2]. This period is also marked by dynamic brain development in shaping cognitive and emotional patterns that a person will maintain in adulthood [3]. This creates opportunities to increase resilience and build lifelong health and well-being [4].

Adolescents begin to learn to develop and maintain social and emotional habits that are important for mental well-being. This includes adopting a healthy sleep pattern, exercising regularly, developing coping, problem-solving, interpersonal skills, and managing emotions [1]. However, at the same time, adolescents also have a high potential to experience life crises and are vulnerable to various kinds of violence [5].

Adolescents are vulnerable to sexual, physical, or emotional violence, drug or alcohol abuse, and risky sexual behavior that can be exacerbated by life difficulties (poverty, unemployment, reality that is not in line with expectations, racial norms, gender discrimination, armed conflict, loss of parents and others) [6]. Significant stress or trauma in adolescents, caused by violence and socio-economic problems, often triggers long-term consequences: the risk of suicide, anti-social behavior, tendencies to become violent offenders, poor academic performance, drug abuse, and the onset of mental disorders [4].

The problem of mental disorders in adolescents currently ranges from 10% to 20%, with the onset of the illness starting from 12 to 24 years [1], [7]. Interventions to promote adolescent mental health aim to strengthen protective factors and increase alternatives to risk-taking. Mental health promotion aims to assist adolescents in building resilience to cope well in difficult situations [1].

Resilience is the ability to make positive adaptations in the face of adversity, trauma, or stress. Resilience is associated with several protective factors in challenging situations, such as problem-focused coping, social support, physical health, cognitive flexibility, and the ability to make sense of adversity [8]. Domains commonly used to measure resilience are anxiety symptoms, depression, hyperactivity, behavioral

problems (delinquency), internal problems, external problems, and general psychological distress [9].

Youth promotion programs for resilience can be carried out in schools using various approaches, usually based on specific socio-demographic or behavioral characteristics [10]. The results of the mental health promotion program on resilience focused on developing coping skills, mindfulness, emotion recognition and management, empathic relationships, efficacy, self-awareness, and help-seeking behavior. Secondary outcomes are decreased symptoms of anxiety, depression and improved academic outcomes [10].

Resilience promotion programs vary in curriculum, duration, implementation, and various tools and activities to convey critical themes and topics. Teaching methods also vary, as do educational resources, teacher and parent training, changes in school systems and resources [10], [11]. Some school programs are classroom-based, with weekly sessions delivered by the class teacher or program staff throughout the classroom. Another approach is to change the school environment to be friendlier and more supportive, but this approach is often combined with a classroom-based system [10].

Many universal school-based resilience promotion interventions have been implemented internationally [9]. A school-based intervention program that has been done is a cognitive behavior therapy (CBT), mindfulness training, stress-enhancing resiliency among students experiencing (ERASE) stress-prosocial (ESPS), integrated stress management program, and resilience curriculum. Two meta-analyses have reported the effectiveness of randomized controlled trials (RCT) of the universal application of the Penn Resilience Program (based on the CBT method) [12], [13]. Several meta-analyses have also reported on the effectiveness of the application. Universal multiple resilience programs in children and adolescents in schools [9], [10], [14], [15].

Of all the research conducted, there has been no meta-analysis and review of the literature specific to examine the effectiveness of resilience programs in adolescents. A review of the literature on the application of resilience programs in schools to adolescents is essential to determine which programs are effective for adolescents and the duration of intervention.

Methods

Data

Sources relevant data sources come from three databases: Pubmed, CINAHL Ebsco, and Proquest. The articles were selected based on the inclusion criteria and followed the protocol Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) to report the articles' findings.

Search strategy

The search was conducted from August to September 2020. Articles related to school-based interventions in increasing resilience were reviewed to extract information. Several keywords were used to find relevant articles in this review, which consisted of "resilience or resilient," "adolescents or teenagers or young adults," and "school-based intervention or classroom-based intervention or teacher implemented."

Inclusion criteria

Inclusion criteria in this study include: (1) articles Full text free of charge and in English; (2) RCT; (3) Publications in the last 7 years (2014-2020); (4) The study was conducted on adolescents (age criteria 10–24 years); (5) original articles.

Exclusion criteria

Exclusion criteria in this study include: (1) Only contains the program protocol; (2) Research literature review; (3) Research on adolescents with autism; (4) The research is conducted outside the school environment; (5) Teachers in schools do not carry out implementation.

The initial selection process for publications was carried out by two researchers (FAT and IMS). Some doubts arose in the selection process, so reviewing all previous publications was carried out 2 times. A complete explanation of the search strategy, article eligibility, and articles included in the analysis are depicted in the PRISMA flow in Figure 1 conducted by two investigators (FAT and IMS). Furthermore, the two researchers also asked for the help of an independent auditor or expert to review the quality of the previous articles/publications used.

Results

Based on the search results from three databases, 4197 articles were found that were considered relevant to the keywords. After the same title was removed, there were 4181 articles. The search was narrowed by limiting publications to the past 7 years (2014-2020). The number of articles found was 3864.

After being screened by reading the title and research abstract, 317 articles were found in the full text that met the requirements. In the end, based on the inclusion criteria, only nine articles could be continued for analysis. The reasons for removing 308 articles from the list review, namely articles in the form of literature reviews, inappropriate population (inappropriate age range and adolescents with autism), not carried out in schools, not carried out by teachers, did not discuss factors related to resilience, and only in the form of protocols.

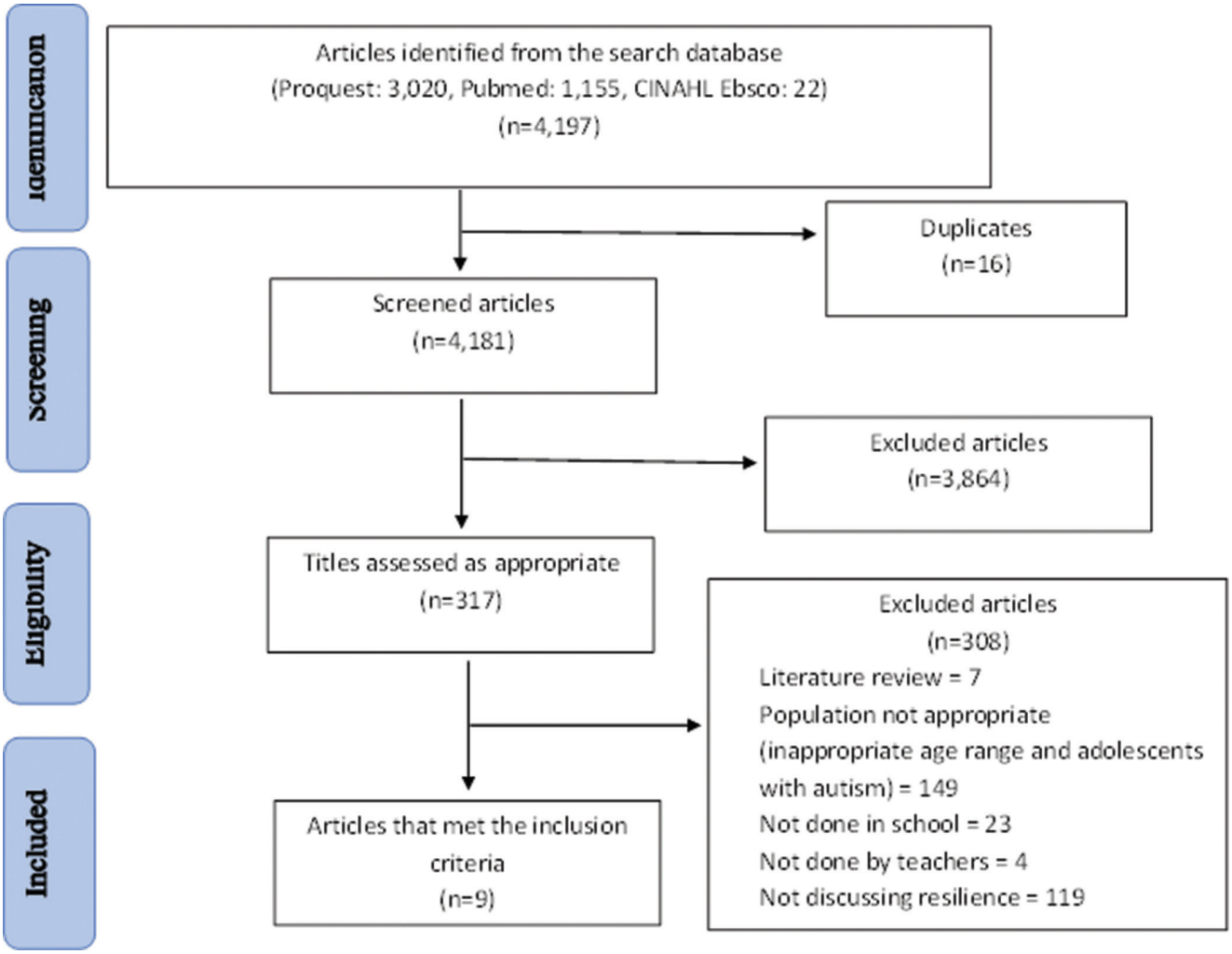

Figure 1: The selection process of articles included in the review

Data extraction was carried out by analyzing data based on the author's name, title, purpose, research method and duration of intervention, number of samples and research results. The results of data extraction can be seen in Table 1.

Discussion

Based on the nine articles analyzed, it was found seven school-based resilience improvement programs in increasing resilience in adolescents, including ESPS, Mindfulness Training with the program Learning to BREATH (L2B), mindfulness-based stress reduction (MBSR), Resilience and Coping Intervention (RCI), Program Preventure, The Adolescent Depression Awareness Program (ADAP), Health Promotion, and Girls first Resilience Curriculum. Of the seven interventions, five interventions appear to have a significant effect on adolescent resilience levels, namely: ESPS, Mindfulness Training with the program L2B, MBSR, RCI, and Girls first Resilience Curriculum. The shortest program duration was RCI, which was 3 weeks ($p = 0.027$, $f^2 = 0.04$), while the most extended period was Girls first for 5 months ($p < 0.01$; ES = 0.46). The focus of each program and the assessment criteria are outlined in Table 2.

ESPS

Stress reduction strategies aim to normalize students' stress reactions, strengthen their resources, teach new coping skills and affective modulation techniques. The theoretical framework that underlies stress reduction strategies is a cognitive-behavioral theory with body-oriented therapy techniques and narrative therapy. Stress reduction topics covered include understanding the nature of stress reactions, strengthening inner resources, calming the body, dealing with fear, anger, loss, and sadness, building social support and developing an optimistic outlook.

Strategies to improve pro-social behavior teach students to develop empathy and compassion for themselves and others and encourage them to act pro-socially in school and society. Pro-social strategies are

Table 1: Summary of reviewed articles

No	Author/Year	Title of Article	Purpose	Method and Duration	Number of samples	Results
1.	Berger *et al.* (2018)	Enhancing Resiliency and Promoting Pro-social Behavior among Tanzanian Primary -school Students: A School-based Intervention	To find out the effectiveness of the ESPS program in increasing resilience and encouraging pro-social behavior among students in Tanzania	RCT duration = 16 sessions × 90 min ± 4 months	183 students Age 11–14 years Intervention ESPS Intervention Group (n = 95) Social Study control group (n = 88)	The results showed a significant overall impact of the ESPS intervention. ESPS is effective in increasing resilience and pro-social behavior and children's functioning. ESPS is also effective in reducing social difficulties, hyperactivity, somatization and anxiety. In addition, the ESPS has a positive effect on children's academic achievement and discipline problems
2.	Dvorakova *et al.* (2017)	Promoting healthy transition to college through mindfulness training with 1st-year college students: A pilot RCT	To evaluate the effectiveness and feasibility of mindfulness training in improving the health and the well-being of 1st-year students	RCT Intervention duration = 8 sessions, 6 weeks	109 1st-year students Age (18–19 years) Intervention group (n = 55), Wait list control (n = 54)	The intervention group showed significantly lower rates of depression, a significantly lower level of anxiety, and a level of life satisfaction significantly higher than control participants. Most students found this program useful for (1) stress reduction and stress management (95%), (2) self-regulation skills (52%), and (3) leading to a healthy lifestyle (48%). The students were confident in using these skills in future stressful situations
3.	Houston *et al.* (2016)	RCT of the RCI with undergraduate university students the RCI	To evaluate programs for students.	RCI Duration of intervention = 3 weeks	129 people (Age 18-23 years) Intervention group (n = 64), Control group (n = 65)	The interaction term for resilience was close to significance. The resilience score in the intervention group increased significantly from the pre- to post-intervention measurements. In addition, the study also showed a significant increase in support, taking action, and expectations, as well as a significant decrease in stress symptoms and a significant decrease in depression
4.	Goossens *et al.* (2015)	Effectiveness of a brief school-based intervention on depression, anxiety, hyperactivity, and delinquency: a cluster RCT	To test the effectiveness of the program pre-venture in the Netherlands on various mental health outcomes at 2, 6, and 12 months post-intervention	Cluster RCT Intervention duration= 2 sessions × 90 min, 2 weeks	699 students Intervention group (n = 343), control group (n = 356)	Intercepts and slopes were significant in both groups for depression scores and anxiety. No significant intervention effect was found in 22 of the 24 tests. A positive intervention effect on anxiety was found in the anxiety sensitivity personality group at 12 months follow-up
5.	Swartz *et al.* (2017)	School-Based Curriculum to Improve Depression Literacy Among US Secondary School Students: A Randomized Effectiveness Trial	To determine the effectiveness of a universal school-based depression education program	RCT Duration= 3 h divided by 2 or 3 classes	6679 students ADAP intervention group (n = 3681), waitlist control group (n = 2998)	ADAP intervention group showed significantly higher depression literacy. However, ADAP did not affect stigma
6.	Tol *et al.* (2014)	School-based mental health intervention for children in war affected Burundi: a cluster-randomized trial	To assess the effectiveness of school-based interventions aimed at reducing symptoms of post-traumatic stress disorder, depression, and anxiety and increasing hope and functioning.	Cluster RCT Intervention duration= 15 sessions in 5 weeks	329 children (mean age 12.29 years) Intervention group (n= 153), waitlist control group (n=176)	However, longitudinal curve analysis in the intervention group showed that children living with both parents had a statistically significant decrease in PTSD and depressive symptoms
7.	Sibinga *et al.* (2016)	School-Based Mindfulness Instruction: An RCT	To evaluate a Mindfulness-Based Stress Reduction (MBSR) program adapted to ameliorate the adverse effects of stress and trauma on low-income and minority public secondary school students	RCT Duration of intervention = 12 weeks	300 students (mean age 12 years) Control group with provision of Health Topic (n = 141), MBSR intervention group (n = 159)	Students who participated in the MBSR program showed better psychological and copying functions, namely decreased depressive symptoms, self-hostility, somatization, negative affect, negative coping, time to reflect, and decreased PTSD level
8.	Dray *et al.* (2017)	Effectiveness of a pragmatic school-based universal intervention targeting student resilience protective factors in reducing mental health problems in adolescents	To evaluate the effectiveness of a universal school-based intervention targeting resilience protection factors in reducing mental health problems in adolescents	Cluster RCT Intervention duration = 9 h divided into several meetings of	3115 students from 32 schools. Intervention group (n = 1909), control group (n = 1206)	There was no significant difference between the intervention and control groups for total SDQ, internal problems, and pro-social behavior. There was a significant difference in the results of external problems in the control group, although small. There was no significant difference between the intervention and control groups for the mean values of internal and external resilience protective factors
9.	Leventhal *et al.* (2015)	Building psychosocial assets and well-being among adolescent girls: A RCT	To assess the effects of a resilience curriculum (RC) program on adolescent girls' psychosocial, physical, and educational well-being	RCT Intervention duration = 23 sessions in 5 months	2508 girls in (57 schools) intervention group (n = 1752), control group (n = 756)	RC has a positive effect on all three assets (resilience, self-efficacy, and socio-emotional). The score in the intervention group was greater than that in the control group. RC had a positive effect on psychological and social well-being

RCT: Randomized controlled trial, ESPS: Enhancing resiliency and promoting pro-social, RC: Resilience curriculum, SDQ: Strengths and difficulties questionnaire, PTSD: Post-traumatic stress disorder, RCI: Resilience and coping intervention, ADAP: Adolescent Depression Awareness Program.

based on socio-emotional learning and contemplative practice. Topics in the pro-social domain include strengthening social skills, cultivating empathy for oneself and others, independent and critical thinking, becoming aware of group bias and prejudice, learning to be active observers, and adopting a pro-social orientation [16].

Mindfulness training

The L2B program is structured to cultivate self-strength and empowerment gradually. The core themes of L2B are Body (body), Reflections (reflection of mind), Emotions (emotions), Attention (attention), Tenderness take it as it is (gentleness and kindness, accept what

Table 2: The focus of each program and the assessment criteria

No	Intervention Program	Focus Program	Author	Assessment criteria	Instrument
1	TIPS	Stress reduction and pro-social enhancement intervention	Berger *et al.*	Functional Impairment:	Child Diagnostic Interview Schedule
				Somatic Complaint	Diagnostic Predictive Scales
				Hyperactivity	Strengths and Difficulties Questionnaire (SDQ)
				Anxiety	Spence Anxiety Scale for Children
				Pro-social Behavior	SDQ
				Social Difficulties	SDQ
2	Mindfulness Training	Gradually fosters self-strength and empowerment	Dvorakova *et al.*	Depression	Primary Health Questionnaire
				Anxiety	Generalized Disorder Scale (GAD)
				Life	Satisfaction The Satisfaction with Life Scale
				Mindfulness	Mindfulness Attention Awareness Scale (MAAS)
				Social engagement	Social Connectedness Scale (SCC-R)
				Self-compassion	Self-Compassion Scale
				Compassion	Compassion Scale (CS)
3	RCI	Identify the thoughts, feelings, and coping strategies related to problems after a traumatic event or associated with daily stress	Houston *et al.*	Resilience	Connor-Davidson Resilience Scale
				Coping	Brief Coping orientations to Problems Experience scale
				Hope	Trait Hope Scale
				Anxiety	GAD Scale
				Depression	Center for Epidemiological Studies Depression Scale
4	MBS	Raising awareness is now focused non-judgmental to reduce irregular focus on the past (contemplation) and worries about the future (anxiety)	Sibinga *et al.*	Mindfulness	Children's Acceptance and Mindfulness Measure
				Depression Symptoms	Children's Depression Inventory Short Form (CDI-S)
				Somatization	Symptom Checklist-90-R
				Anxiety	Multidimensional Anxiety Scale for Children (MASC)
				Mood and Emotional Regulation	Positive and Negative Affect Schedule (PANAS), Differential Emotions Scale (DES), Aggression Scale, and State-Trait Anger Expression Inventory (STAXI-2)
				Coping	Children's Response Style Questionnaire (CRSQ), Brief COPE, and Coping Self-Efficacy Scale (CSE)
				PTSD Symptoms	Checklist Post-Traumatic Symptom Severity (CPSS).
5	Girls' First	Builds youth's physical and emotional well-being.	Leventhal *et al.*	Emotional	Connor-Davidson Resilience Scale
				Socio-emotional assets	Child and Youth Resilience Measure
				Depression	Patient Health Questionnaire-9
				Anxiety	GAD Scale
				Somatization	Diagnostic Predictive Scales
				Psychological	KIDSCREEN-52 psychology well-being
				Social Welfare	KIDSCREEN-52 Social

SDQ: Strengths and difficulties questionnaire, GAD: Generalized disorder scale, MAAS: Mindfulness attention awareness scale, SCC-R: Social connectedness scale, CS: Compassion scale, CDI-S: Children's depression inventory short form, MASC: Multidimensional anxiety scale for children, PANAS: Positive and negative affect schedule, DES: Differential emotions scale, STAXI: State-trait anger expression inventory, CSRQ: Children's response style questionnaire, CSE: Coping self-efficacy scale, CPSS: Checklist post-traumatic symptom severity.

is), and Habits (habits to think healthy) [17]. This program aims to improve students' emotional regulation skills, introduce simple attention techniques to manage stressful situations better, and facilitate the learning process in a supportive group environment [18].

RCI

RCI focuses on the discussion of problems in groups. Participants have the opportunity to share and validate their own experiences, know that others have the same thoughts and feelings related to the shared situation, express and process their thoughts and feelings related to a problem, correct cognitive distortions, recognize coping strategies that exist in the case. Themselves learn new coping strategies from peers, connect with support, learn problem-solving, and benefit from helping others [8].

MBSR

The MBSR program consists of three components: (1) didactic materials related to mindfulness, meditation, yoga, and mind-body connection; (2) the exercise of various meditation experience mindfulness, mindful yoga, and body awareness during group meetings and encouragement to exercise at home; and (3) group discussions focused on applying techniques mindfulness to everyday situations and solving problems related to barriers to effective practice [19]. Mindfulness can increase students' capacity to manage stress and the inevitable trauma they face and approach trauma information [19]. By providing high-quality mindfulness instruction during childhood, improvements in psychological, coping, and post-traumatic symptoms have the potential to change lives in meaningful ways, including academic performance, mental and physical health, and quality of life.

Girls' first (resilient curriculum in Bihar, India)

The initial session on the topic of intervention is to integrate methods from positive psychology, social-emotional learning, and life skills. Adolescents identify their character strengths and use them to identify and plan to achieve goals. Then, adolescents learn coping skills, building their character strengths and other positive psychological skills, such as making meaning (finding an advantage in difficult situations) and emotional intelligence such as identifying and managing difficult emotions. Then, adolescents are taught to use these assets as a basis for resolving problems and conflicts, which are taken from restorative practices. In the final session, youth work together to design and implement a reconciliation project in their own or someone else's lives. They are asked to exercise character strength,

emotional intelligence, and interpersonal skills and use them to find meaning in life.

One of the interventions that have not been significant is the ADAP. ADAP aims to increase literacy (knowledge) about depression as a first step in encouraging young people to seek treatment. Components of ADAP learning include: identifying the symptoms of depression, understanding the medical decision-making process, seeing parallels between depression and other medical illnesses, recognizing suicide as a potential consequence of depression, and understanding that depression is a treatable medical illness. However, ADAP only increased knowledge about depression literacy, found no significant effect on mental health stigma [20]. While the preventure program appears to prevent drug use problems effectively, this study found no evidence of its effectiveness in other mental health problems [21].

The resilience curriculum has been widely practiced in developed countries, such as the United States, Australia, the Netherlands, and Switzerland. However, implementing the curriculum in developing countries (predominantly low-income countries) is rarely done. In the analysis of this article, there are six studies conducted in developed countries (United States, Australia, and the Netherlands) and three studies conducted in countries low income, such as Burundi, India, and Tanzania. Implementing a resilience curriculum or intervention in low-income countries adapted from a resilience curriculum in developed countries can be done by adjusting the program to the local culture [16], [22].

Resilience has, in some studies, been associated with several factors that appear to promote protection in challenging situations, such as problem-focused coping, social support, physical health, cognitive flexibility, and the ability to create meaning out of adversity [23]. Interventions designed to increase resilience often focus on increasing strength and protective factors [24].

The measuring tools or instruments used to measure the effectiveness of universal school-based resilience programs appears to be diverse. In the analysis of this article, the factors that influence resilience are functional disorders, depression, anxiety, somatization, hyperactivity, coping, self-efficacy, negative emotions/ affect, hope, compassion, pro-social behavior, socio-emotional assets, psychological and emotional well-being. The instruments use standardized measuring devices and are adjusted to each factor.

The duration of the intervention did not affect the outcome. The time of the RCI, which was only 3 weeks, proved to be effective compared to the class-based intervention, which was carried out for 5 weeks. However, supporting factors, such as parents and family, influence resilience and levels of depression; this is evidenced by the research of Tol *et al*. that children living with both parents have a statistically significant decrease in PTSD and depressive symptoms [25].

Implications

Interventions to improve school-based adolescent resilience are essential to development. This review highlights the potential benefits of a school-based youth-enhancing program without the adverse risks in this review. Limited empirical evidence shows that school-based resilience programs can develop empathy, compassion for oneself and others, encouraging adolescents to be pro-social at school and in society [16]. In addition, they can improve emotional regulation, can manage stress and work in a supportive group, learn to solve problems and recognize their coping strategies, and find meaning in life [8], [17], [19].

Although further research is needed, especially in developing countries like Indonesia, the evidence available in this review can harness health care in a school setting. This study shows the value of resilience interventions that can help adolescents to have positive adaptations in dealing with various difficulties, problems, and stress in the school environment. So that this intervention can be a means to improve and maintain a healthy learning environment. The evidence in this study could be the idea that school-based resilience interventions are adaptable and worthwhile.

Conclusion

Many adult diseases are rooted in childhood exposure to stress and trauma [26]. It is essential to develop primary prevention strategies in childhood and adolescence to reduce their adverse effects. One effective way to prevent anxiety and depression in adolescents is to build adolescent resilience through school resilience improvement programs.

Increasing resilience in schools prepares adolescents to face various stresses and difficulties to prevent mental disorders. However, unfortunately, universal school-based resilience improvement programs have not been widely implemented in developing and low-income countries. In Indonesia, there is no universal school-based resilience improvement program. Therefore, the authors suggest the importance of building a school-based resilience improvement program for adolescents in developing countries, such as Indonesia.

In addition, in the analysis of articles, it was found that not all implementation of resilience interventions in schools had a significant impact. More experimental research is needed on school-based resilience improvement programs, especially for youth in developing and low-income countries.

Data Availability Statement

All data generated or analyzed during this study are included in this published article (and its supplementary information files).

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