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Parent interactions and physical aggression among Indonesian adolescents: a cross-sectional study

Original article

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Abstract: **Objective:** This study aimed to examine the association between parent–child relationships and physically aggressive behavior among adolescents.

Methods: This is a cross-sectional study that uses secondary data from the 2015 Indonesia Global School-Based Health Survey (IGSHS). Health surveys were conducted in 75 schools representing three regions (Sumatra, Java-Bali; Outer Sumatra; and Java-Bali) in 26 provinces and 68 districts/cities in Indonesia (N = 10,139 students). Students who participated were aged 12–19 years, were enrolled in public schools in the junior and high school levels.

Results: It has been seen that for most middle-aged adolescents (58.7%), their parents (25%–29%) pay less attention to academic assignments (homework), problems, and use of free time. The most significant factors that influence adolescents to commit violence are smoking and consuming alcohol. Adolescents who smoke are twice as likely to commit physical violence compared with adolescents who do not smoke (OR = 2.005; 95% CI = 1.7062–2.396). Meanwhile, adolescents who consume alcohol are 1.8 times more likely to commit physical violence compared with adolescents who do not consume alcohol (OR = 1.807; 95% CI = 1.421–2.298).

Conclusions: Through educational activities and consultations, this study's findings are valuable for establishing parenting programs among those concerned about their children's aggressive behavior. Meanwhile, counseling programs can be started in schools by conducting self-detection of negative adolescent behavior, such as screening for smoking, alcohol consumption, sleep issues, and attempted suicide.

Keywords: *parent-child relations • adolescent behavior • smoking • alcohol drinking • violence • cross-sectional studies • Indonesia*

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1. Introduction

Adolescence is characterized by rapid physical, psychological, and intellectual growth and development.[1] Adolescents frequently experience failure during their lives, which causes dissatisfaction and conflict.[2] Weak emotional control or self-regulation, impatience, and gender differences all contribute to violent behavior

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in adolescents.[3] Adolescents' most common reason for aggressive behavior often comes from their immediate surroundings.[1]

Aggressive behavior among adolescents is often related to how they are educated and their parents' contribution in their upbringing, which is closely related to the emergence of aggressive behavior in children.[4] One way to prevent aggressive behavior in children is by building a close relationship between parents and children.[5] When the attachment between adolescents and parents is well established, emotional needs are met so that adolescents do not experience emotional deficiencies, which can result in aggressive behavior.[6]

Focusing on adolescents aged 12–19 years is essential because this developmental stage is marked by rapid physical, psychological, and social changes that can heighten vulnerability to aggressive behavior.[7] Adolescence is often a period of identity exploration and emotional volatility, making teenagers more likely to experience frustration, conflict, and challenges in emotional regulation.[8,9] Consequently, understanding how parental relationships impact aggression in this age group is crucial, as these formative years are pivotal in shaping future behavioral and relational patterns. The influence of parents during adolescence can provide stability and guidance, potentially reducing tendencies toward aggression that often arise as adolescents navigate pressures and social influences.[10]

Despite the body of research on adolescent aggression, there are still gaps in understanding the specific role of parent–child relationships in Indonesia. Previous studies have primarily focused on external factors, such as peer influence and environmental conditions, or broader parenting styles like authoritarian or permissive approaches.[11] While these factors are significant, there is a limited focus on the direct, everyday interactions between parents and adolescents and how these interactions contribute to or mitigate aggressive behavior. Furthermore, studies often examine aggression in Western contexts, so culturally specific insights into the Indonesian adolescent experience remain underexplored.

This study aims to bridge these gaps by examining the association between parental involvement and physical aggression, specifically within Indonesian adolescents. Focusing on the family unit allows for a concentrated analysis of how direct parental responses—such as attentiveness to academic assignments, emotional support, and monitoring of free time—impact adolescent aggression. By analyzing these parent–child dynamics, this study provides valuable insights into practical, culturally relevant strategies for Indonesian families to help reduce aggressive behaviors. The study's emphasis on parental responses, rather than external social factors, highlights the importance of family based interventions that can be directly implemented within the household setting.

Previous research has found that 35.6% of adolescents experienced physical hostility, while 36.4% had been involved in physical confrontation.[12] In India, 46.04% of the adolescent population has faced physical aggression.[13] In Iran, 63.61% of teenagers exhibited aggressive behavior.[14] Aggressive behavior increases during adolescence, with 51% exhibiting aggressive behavior by the end of high school.[15] Adolescents who exhibit physical violence are 51.7% more likely to hurt themselves or others;[16] 2.2% of adolescents show self-harm—on average, they bang their heads against walls, causing cuts, bruises, and even burns.[17]

Aggressive behavior is a form of expressing the impact of failure on individuals, such as physical attacks (hitting, kicking, slapping, anything related to physical violence), verbal (insulting, mocking, cursing, anything related to psychology), and intentional object destruction (throwing glass when angry).[18] Aggressive behavior can appear when adolescents are in unpleasant situations or circumstances[19] and in anger.[20] Causes of physical aggression in adolescents involve internal and external factors.[21] Internal factors arise within each individual, such as weak emotional control or self-control, frustration, and gender differences.[3] Meanwhile, external factors come from peers, environment, family, school, and other social activities.[22] Adolescent aggressive behavior occurs more often in the family environment, meaning that the leading cause of aggressive behavior in adolescents is the people and environment closest to them.[1]

Adolescent parent–child relationships and aggressive behaviors must be examined in-depth. There has been limited study on this topic in Indonesia. Other research has discovered that parental education, environment, culture, authoritarian parenting, permissive parenting, and uninvolved parenting are all factors that influence how parents educate themselves, which can lead to aggressive treatment by adolescents.[23] Other research suggests that parents' lack of involvement in shaping their children's personalities can contribute to aggressive conduct.[24] This study is unique in that it examines the effects of age, gender, smoking habits, alcohol usage, suicide attempts, and parent–child relationships on aggressive behavior among adolescents. The study aims to look at how parent–child relationships affect adolescents' physically aggressive behavior.

2. Methods

2.1. Study design

This cross-sectional study employs secondary data from the 2015 Indonesia Global School-Based Health

Survey (IGSHS). IGSHS is the most recent data, as the Indonesian government has not issued any new statistics. A health survey was undertaken in 75 schools spanning three areas (Sumatra, Java-Bali; Outer Sumatra; and Java-Bali) throughout 26 provinces and 68 districts/cities in Indonesia. Using data from 2015 remains relevant for understanding the relationship between parent–child interactions and adolescent aggression, as the fundamental aspects of family dynamics and adolescent development are relatively stable over time. This dataset provides a comprehensive, nationally representative snapshot of adolescent behavior across multiple regions in Indonesia, making it a valuable resource for identifying trends and establishing baseline associations that are likely still applicable in the current social landscape. Additionally, while specific social factors may evolve, the core relationships between parental involvement, adolescent behavior, and aggression provide insights that can inform current interventions and policy recommendations. The 2015 IGSHS data is still relevant and this is stock data as there has been no re-survey conducted by the Indonesian government.

Data were collected through structured questionnaires administered to students in a school setting. To ensure accuracy, data cleaning processes were applied, and any incomplete or inconsistent responses were excluded from the analysis. For this study, inclusion criteria were students aged 12–19 years who attended public junior and high schools, while exclusion criteria were respondents with incomplete or inconsistent responses.

2.2. Participants

The research population was middle and high school children in Indonesia. Students were from 12 to 19 years old and represented diverse geographic and social backgrounds. The sample size was 11,142 students. The author then chose missing data by deleting data that were left blank or had partial information. The sample size was determined to be 10,139 students. The sampling technique was a two-stage cluster. First, school selection was carried out with a likelihood proportionate to the school's registrant criteria. Both classes were randomly selected, and all students were eligible to participate.

2.3. Measures

The independent variables in this study were age, gender, parent–child interaction (attention to homework, attention to children's problems, attention to children's use of free time), smoking habits, loneliness, sleep problems, suicide (thinking about committing suicide, planning suicide, and attempting suicide), friends, daily activities, and alcohol consumption habits. The dependent variable is physical aggression in adolescents in Indonesia.

Data collection was carried out using a self-reported questionnaire, taking into account the anonymous aspect to avoid bias and for confidentiality of information. Students were asked not to include their names or other identification codes. Respondents were asked to fill out the questionnaire provided with an explanation or guide on how to fill it out. Data collection was carried out in selected schools. Age was asked as, "How old are you now?" Age was categorized into <13 years old (middle school) and >13 years old (high school). Gender was divided into male and female. Parental attention to homework, problems, and free time are three sub-variables in parent–child interactions. Parent–child interactions are classified into less, moderate, and strong. One example of a question is, "During the last 30 days, how often did your parents check whether you had finished your homework?" Smoking habits were categorized as yes and no, asked as, "How many days did you smoke in 30 days?" Feeling lonely was asked as "During the last 12 months, how often did you feel lonely?" Sleep problems were asked as, "During the last 12 months, how often did worrying about something make you unable to sleep at night?" Loneliness and sleep problems were each categorized into three (no, rarely, always). Suicide consisted of three sub-variables, including suicidal ideation, planning, and attempted suicide. Each was categorized into yes and no answers. The friend variable was asked as, "How many close friends do you have?" Daily activity was asked as, "During the last seven days, how long did you carry out physical activity for at least 60 minutes a day?" Alcohol drinking habits were asked as, "During the last 30 days, on how many days did you drink at least one drink containing alcohol?" Meanwhile, for physical aggression, the question was, "During the last 12 months, how many times were you involved in physical fights?"

2.4. Ethical consideration

The WHO, the US Centers for Disease Control (CDC) Ethics Committees, and the Indonesian Ministry of Health authorized the initial survey. This research examined existing public data readily available online but stripped of all identifying information. The GSHS project provided permission to view the Indonesia dataset. The data source was from https://www.cdc.gov/gshs/countries/seasian/indonesia.htm, released on 13 February 2019.

2.5. Statistical analysis

This study used a primary sampling unit, stratum, and sample weight to perform complex sample analysis. Frequent distribution, percentage, chi-square, and multinomial logistic regression were used for the data analysis. The odds ratio of the contribution of factors impacting physical aggression for adolescents was determined using multinomial logistic regression with 95% CI. A significant effect between physical aggression for adolescents and the independent variable is indicated by a *P*-value of 0.05. The author conducted all statistical analyses using Statistical Package for the Social Sciences version 21.0 software (SPSS Inc., Chicago, IL, USA).

3. Results

3.1. Respondent characteristics

Most adolescents in Indonesia are >13 years old (60%), and parents who lacked giving attention to academic assignments (homework), problems, and use of free time were in the range of 25%–29%. It was found that 9.8% of adolescents were smokers, 3.6% consumed alcohol, 5.9% always felt lonely, and 4.2% always had problems sleeping. Adolescents who had suicidal ideas and attempted suicide were in the range of 3%–5% (Table 1).

3.2. Factors associated with adolescent physical aggression in Indonesia

Based on Table 2, the factors associated with physical violence in adolescents in Indonesia were age, gender, parents knowing about the problem, parents knowing about free time, smoking, feeling lonely, not being able to sleep, thinking about committing suicide, planning suicide, and making attempts suicide, having friends, and alcohol (with all *P*-values <0.001). Meanwhile, the factor of parental attention in monitoring children's homework and physical activity is not related to physical violence, with *P*-values of 0.849 and 0.261 > 0.05, respectively.

3.3. Determinants of adolescent physical aggression

Factors associated with physically aggressive behavior among school adolescents in Indonesia were age, gender, parents knowing about the problem, parents knowing about free time, smoking, feeling lonely, not being able to sleep, thinking about committing suicide, making suicide attempts, and alcohol (*P* < 0.001). The most

Variable	N	Percentage (%)
Age		
<13 years old (middle school)	4055	40.0
>13 years (high school)	6084	60.0
Gender		
Male	4533	44.7
Female	5606	55.3
Parents check homework		
Weak	2702	26.6
Currently	3870	38.2
Strong	3567	35.2
Parents know the problem		
Weak	2934	28.9
Currently	3640	35.9
Strong	3565	35.2
Parents know free time		
Weak	2521	24.9
Currently	3528	34.8
Strong	4090	40.3
Smoking habits		
No	9145	90.2
Yes	994	9.8
Loneliness		
No	5326	53.0
Seldom	4173	41.2
Always	597	5.9
Sleep problem		
No	5815	57.4
Rarely	3895	38.4
Always	429	4.2
Thinking about suicide		
No	9617	94.9
Yes	522	5.1
Planning suicide		
No	9592	94.6
Yes	547	5.4
Attempting suicide		
No	9858	97.2
Yes	281	2.8
Having friends		
No	251	2.5
Yes	9888	97.5
Physical activity ≥5 d		
No	3239	31.9
1–4 d	6900	68.1
Alcohol drinking habits		
No	9779	96.4
Yes	360	3.6

Table 1. Characteristics of adolescents in Indonesia.

Variable	Physical aggression			*P*-value*
	No (*n*/%)	Yes (*n*/%)	Total (*n*/%)	
Age				<0.001
<13 years old (middle school)	2987 (38.0)	1068 (46.7)	4055 (40.0)	
>13 years (high school)	4867 (62.0)	1217 (53.3)	6084 (60.0)	
Gender				<0.001
Male	3014 (38.4)	1519 (44.7)	4533 (44.7)	
Female	4840 (61.6)	766 (33.5)	5606 (55.3)	
Parents check homework				0.849
Weak	2103 (26.8)	599 (26.2)	2702 (26.6)	
Currently	2989 (38.1)	881 (38.6)	3870 (38.2)	
Strong	2762 (35.2)	805 (35.2)	3567 (35.2)	
Parents know the problem				<0.001
Weak	2191 (27.9)	743 (32.5)	2934 (28.9)	
Currently	2832 (36.1)	808 (35.4)	3640 (35.9)	
Strong	2831 (36.0)	734 (32.1)	3565 (35.2)	
Parents know free time				<0.001
Weak	1764 (22.5)	757 (33.1)	2521 (24.9)	
Currently	2605 (33.2)	923 (40.4)	3528 (34.8)	
Strong	3485 (44.4)	605 (26.5)	4090 (40.3)	
Smoking habits				<0.001
No	7346 (93.5)	1799 (78.7)	9145 (90.2)	
Yes	508 (6.5)	486 (21.3)	994 (9.8)	
Loneliness				<0.001
No	4305 (54.8)	1064 (46.6)	5326 (53.0)	
Rarely	3120 (39.7)	1053 (46.1)	4173 (41.2)	
Always	429 (5.5)	168 (7.4)	597 (5.9)	
Sleep problems				<0.001
No	4671 (59.5)	1144 (50.1)	5815 (57.4)	
Rarely	2895 (36.9)	1000 (43.8)	3895 (38.4)	
Always	288 (3.7)	141 (6.2)	429 (4.2)	
Thinking about suicide				<0.001
No	7507 (95.6)	2110 (92.3)	9617 (94.9)	
Yes	347 (4.4)	175 (7.7)	522 (5.1)	
Planning suicide				<0.001
No	7485 (95.3)	2107 (92.2)	9592 (94.6)	
Yes	369 (4.7)	178 (7.8)	547 (5.4)	
Attempting suicide				<0.001
No	7686 (97.9)	2171 (95.1)	9858 (97.2)	
Yes	168 (2.1)	113 (4.9)	281 (2.8)	
Having friends				<0.001
No	174 (2.2)	77 (3.4)	251 (2.5)	
Yes	7680 (97.8)	2208 (96.6)	9888 (97.5)	
Physical activity ≥5 d				0.261
No	2847 (31.7)	752 (32.9)	3239 (31.9)	
1–4 d	5367 (68.3)	1533 (67.1)	6900 (68.1)	
Alcohol drinking habits				<0.001
No	7676 (97.7)	2103 (92.0)	9779 (96.4)	
Yes	178 (2.3)	182 (8.0)	360 (3.6)	

*Note: *P*-value = chi-square test.

Table 2. Analysis of factors associated with physical aggression among adolescents in Indonesia.

significant factors that influence adolescents to commit violence are smoking and consuming alcohol. Adolescents who smoke are twice as likely to commit physical violence compared with adolescents who do not smoke (OR = 2.005; 95% CI = 1.7062–2.396). Meanwhile, adolescents who consume alcohol were 1.8 times more likely to commit physical violence compared with adolescents who do not consume alcohol (OR = 1.807; 95% CI = 1.421–2.298) (Table 3).

Parents who pay less attention to their children in terms of not knowing about their children's problems contribute one time more to their children committing physical aggression compared with parents who pay attention to their children (OR = 1.077, 95% CI = 1.007–1.152). Adolescents who have attempted suicide were twice as likely to commit physical aggression compared with normal adolescents (OR = 1.641; 95% CI = 1.233–2.185). Adolescents who experience sleep problems were one time more likely to commit physical aggression than adolescents who do not have sleep problems (OR = 1.380; 95% CI = 1.260–1.511). Adolescents who feel lonely were also one time more likely to commit physical aggression compared with adolescents who do not experience loneliness (OR = 1.316; 95% CI = 1.205–1.437).

4. Discussion

The results of the study found that factors related to physical aggression among adolescents in Indonesia were age, gender, parents knowing about the problem, parents knowing about free time, smoking, feeling lonely, not being able to sleep, thinking about committing suicide, attempting suicide, and alcohol. The research results show that age was related to physical violence behavior. Early adolescence can be caused by adolescents' higher emotional levels and approaching puberty.[25] Other research says that adolescence is called *sturm* and *drang* (in German language), meaning it is a period where there is heightened emotional tension caused by changes in physical condition and the functioning of the glands that occur at this time.[26]

Variable	OR	95% CI	
		Lower	Upper
Age (years)	0.595	0.538	0.660
Gender	0.351	0.341	0.391
Parents know the problem	1.077	1.007	1.152
Parents know free time	0.722	0.675	0.774
Smoke	2.055	1.762	2.396
Feel lonely	1.316	1.205	1.437
Cannot sleep	1.380	1.260	1.511
Thinking about suicide	0.670	0.536	0.838
Attempting suicide	1.641	1.233	2.185
Alcohol	1.807	1.421	2.298

Table 3. Final results analysis of the interaction of factors associated with physical aggression in adolescents in Indonesia.

The research results showed that male adolescents had a relatively higher prevalence of physical violence compared with females. These findings are consistent with various other studies showing that boys have significantly higher scores in all forms of physical aggression regardless of parental bond compared with girls.[27] Teenage boys use physical aggression to achieve social dominance, such as increasing relationships, popularity, and reputation.[28] Therefore, parental interactions do not appear to significantly influence the level of physical aggression in adolescent boys compared with adolescent girls. Research shows that as many as 96.6% of adolescents who have friends commit physical violence. According to research conducted in the United States, having friends has two positive and negative qualities. Friendships surrounded by negative qualities will undoubtedly give rise to conflict and power asymmetries, thus becoming protective against developing and maintaining aggressive behavior.[29]

This research links one potential risk factor, namely parent–child interaction, with physical aggression among adolescents in Indonesia. Parents who do not know about adolescents' problems and free time can cause adolescents to commit physical violence. Various studies support these findings and show that poor parental bonding, lack of parenting behavior, and parental relationship conflict are associated with physical aggression, violence, bullying, and other externalizing behaviors in adolescents.[30] Lack of family communication, especially parent–child, causes lack of emotional support and a low level of parental acceptance of their children, resulting in children carrying out physical aggression as a means of expressing their feelings.[31] Therefore, parent–child interactions in terms of treatment and supervision greatly influence the physical aggression of adolescents in Indonesia.

The results of this study also show that the prevalence of cigarette users were two times more likely to commit physical violence compared with non-cigarette users. Other research suggests that smoking can increase aggressive behavior in adolescents.[32] Cigarette users have lower neuroticism scores when compared with non-smokers, which can be attributed to the stimulus–response effect of smoking. Additionally, nicotine depletion, identified as the period between cigarettes, is thought to induce strong negative emotional states.[33] Furthermore, it was found that adolescents who felt lonely tended to commit physical violence. According to research in India, people who feel lonely have negative

thoughts about other people and themselves. On this basis, loneliness causes people to develop pessimistic perceptions of themselves, for example, feelings of being unwanted and feelings of being rejected by others, which leads individuals to commit aggression.[34] The results of this research also show that adolescents in Indonesia who have high levels of insomnia tend to commit physical violence. However, the results are only a tiny percentage, namely 6.2%. Lack of sleep (insomnia) can reduce activity in the prefrontal cortex (PFC) (involved in executive and inhibitory processing) and increase its functional connectivity to the amygdala (involved in emotional responses to threats), thus providing a biological basis for predicting more reactive aggression.[35]

Another finding in this research is that adolescents who think about committing suicide and make suicide attempts are more likely to commit physical violence. It does not rule out the possibility that, in the future, someone who plans and attempts suicide will not carry out aggressive behavior.[36] Furthermore, the research results show that alcohol users are more likely to commit physical violence than non-alcohol users. In research, it is stated that aggressive behavior in alcoholics appears more quickly due to disruption of executive cognitive function and PFC function, which is associated with aggression.[37] An alcoholic person not only carries out aggressive behavior toward other people but also toward himself because he often feels guilty toward himself. Individuals will too often blame themselves for the failures they were experiencing, and hence they feel that they no longer matter. Alcohol addiction can be one of the causes for someone committing suicide. At first, alcohol consumption is in order to relieve the feelings of depression and frustration experienced. However, over time, feelings of guilt arise, which worsens their feelings of depression and frustration.[38]

The factors that are not related to physical violence were parents' behavior of checking homework and physical activity. The behavior of parents checking homework does not have a significant relationship with physical violence. The role of parents in checking homework is related to the child's motivation and achievement, so it is not related to physical violence.[39] Engagement in physical activity was another factor significantly associated with reduced adolescent physical aggression. Adolescents who are classified as physically aggressive appear to be less physically active than adolescents who do not commit violence. Other studies have reported that increased participation in extracurricular physical activities and substantial involvement in sports are associated with decreased physical aggression in adolescents.[40] Physical activity can cause increased body temperature, higher release of norepinephrine and endorphins, increased blood and oxygen flow to the brain, increased nerve cell growth and brain plasticity, and decreased blood pressure and resting heart rate. This physiological effect is often associated with a decrease in stress and anxiety levels, which is positively related, so it can be concluded that physical activity is an effort to prevent physically aggressive behavior, and is not one of the triggering factors.[41]

4.1. Implication for nursing practice

This study's findings are valuable in establishing parenting programs for parents who have concerns with their children's aggressive behavior through educational activities and consultations. Meanwhile, counseling programs can be started in schools by conducting self-detection of negative adolescent behavior, such as screening for smoking, alcohol usage, sleep issues, and attempted suicide.

4.2. Strengths, limitations, suggestions, and ideas for future research

This study has notable strengths, particularly its large, nationally representative sample of over 10,000 Indonesian adolescents. The findings provide a broad perspective on the relationship between parent–child interactions and adolescent aggression by drawing on the 2015 IGSHS and including schools across diverse regions. Highlighting smoking and alcohol consumption as predictors of aggressive behavior gives practical insights into specific behaviors that may be targeted in preventive interventions. These results are valuable for informing both parenting strategies and school-based programs that focus on counseling and behavioral screening to address early signs of aggression among adolescents.

However, the study also has limitations. Its cross-sectional design limits the ability to establish causation. It can only identify associations rather than determine whether poor parental interactions cause aggression or if the behaviors influence each other in complex ways. Additionally, reliance on self-reported data could introduce bias, as adolescents may overstate or understate behaviors like aggression or substance use. Another limitation is the lack of detailed metrics on parent–child interactions, as the survey primarily focuses on basic aspects like homework, free time, and problem-solving, without exploring nuances such as parental warmth, communication, or discipline style, which may impact aggressive behaviors.

5. Conclusions

This study highlights that close parental involvement—such as providing attention to academic tasks, emotional support, and monitoring social interactions—strongly correlates with reduced aggressive behavior in Indonesian adolescents. Adolescents with supportive parental relationships show significantly lower levels of physical aggression than those with less parental engagement. Additionally, gender and family structure influence aggression levels, with differences observed based on the adolescent's gender and whether both parents are present in the household. These findings suggest that family based strategies can be effective in reducing aggression. For future research, longitudinal studies could examine the long-term impact of parental involvement as adolescents transition to adulthood. It would also be beneficial to investigate the effects of peer influence, school environment, and digital media exposure on aggression, as well as the effectiveness of programs designed to strengthen parent–child relationships across various cultural and socioeconomic groups in Indonesia.

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Author contributions

Concept—YBP, AZZ, and SSIW; Design—YBP, AZZ, and NM; Supervision—YBP, TH, and RAL; Funding—AZZ and YBP; Materials—YBP, ADK, NM, NLM, and TH; Data Collection and/or Processing—YBP and AZZ; Analysis and/or Interpretation—SSIW and YBP; Writing—YBP, AZZ, and SSIW; Critical Review—YBP and SSIW.

Ethical approval

The WHO, the US Centers for Disease Control (CDC) Ethics Committees, and the Indonesian Ministry of Health authorized the initial survey. This research examined existing public data readily available online, but stripped of all identifying information. The GSHS project provided permission to view the Indonesia dataset. The data source was from https://www.cdc.gov/gshs/countries/seasian/indonesia.htm, released on 13 February 2019.

Conflicts of interest

All contributing authors declare no conflicts of interest.

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