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Literature Review: Factors Associated with Hepatitis a Prevention Among Students in the School Environment

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Abstract

Hepatitis A represents a significant public health concern among student populations in Indonesia with considerably high prevalence rates. This study aimed to identify and analyze factors associated with hepatitis A prevention among students through systematic literature review. A systematic review was conducted on 20 research articles published between 2020-2024 using cross-sectional, case-control, and pre-experimental designs with total samples ranging from 36 to 835,256 respondents. Factors demonstrating the strongest associations included handwashing with soap behavior (OR=7.90), personal hygiene (OR=5.71), history of contact with patients (OR=9.92), unsafe food consumption (OR=10.545), unhygienic toilet use (OR=10.500), and communal eating habits (OR=21.48). Knowledge showed significant correlation with prevention practices ($p<0.05$), while attitude demonstrated inconsistent results. Immunization status emerged as the most effective protective factor with risk reduction up to 94.4% (OR=0.056). Socioeconomic factors and school environmental conditions served as structural determinants. Hepatitis A prevention among students requires a comprehensive multi-level approach integrating health education, school sanitation improvement, food safety monitoring, clean and healthy lifestyle promotion, and vaccination programs.

Keywords: Hepatitis A, Prevention, School, Students.

INTRODUCTION

Hepatitis A is an acute liver infection caused by the Hepatitis A Virus (HAV) and represents a significant global public health concern, particularly in developing countries. The disease is transmitted via the fecal-oral route, primarily through the consumption of food or beverages contaminated with the virus. According to the World Health Organization (WHO), approximately 1.4 million cases of hepatitis A occur worldwide each year. Children and adolescents in school-age populations are especially vulnerable to hepatitis A infection due to suboptimal hygiene practices, high levels of social interaction in school environments, and an immune system still under development. Inadequate sanitation within schools further contributes to the increased risk of transmission among students.

In Indonesia, the prevalence of hepatitis A is relatively high, particularly among children and adolescents who spend most of their time in school settings. Basic Health Research (Riskesdas) data indicate that the prevalence of hepatitis across the country is significant, with uneven distribution across regions. Students, as a productive age group, face a high risk of hepatitis A infection due to behaviors such as consuming street food, sharing sanitation facilities, direct contact with peers, and limited awareness regarding the importance of clean and healthy practices. Clinical manifestations of hepatitis A in children can vary from asymptomatic infections to severe symptoms, including jaundice, fever, nausea, vomiting, and hepatomegaly, which may disrupt learning and productivity at school.

Preventing hepatitis A among students requires a strategic, multifactorial, and comprehensive approach. Several factors have been identified as influential in the success of hepatitis A prevention, including knowledge, attitudes, behaviors, socioeconomic conditions, access to sanitation facilities, family support, the role of school health personnel, and school health policies. Adequate knowledge about hepatitis A, its modes of transmission, clinical symptoms, and preventive measures forms a critical foundation for developing effective preventive behaviors. Positive attitudes toward hygiene practices and awareness of health risks are also crucial in motivating students to consistently implement preventive behaviors both at school and at home. Behavioral factors are the main determinants in hepatitis A prevention among students, including handwashing with soap, selecting

safe food and beverages, using hygienic toilets, and maintaining good personal hygiene. Handwashing with soap and running water at critical times—such as before meals, after defecation, and after playing—is a simple yet highly effective intervention in breaking the chain of hepatitis A transmission. However, studies show that students' adherence to handwashing practices remains low, influenced by factors such as the availability of handwashing facilities, perceptions of handwashing importance, peer influence, and habits reinforced by teachers and parents.

The school environment plays a significant role in preventing hepatitis A among students. Adequate clean water, proper sanitation facilities (e.g., clean and maintained toilets, handwashing stations with soap), hygienic school canteens, and effective waste disposal systems are essential infrastructure supporting preventive efforts. Research indicates that schools with poor sanitation facilities face higher risks of fecal-oral transmitted diseases, including hepatitis A. Additionally, classroom density, poor ventilation, and overall school cleanliness contribute to the risk of infectious disease transmission, including hepatitis A. Family socioeconomic factors are also strongly correlated with students' hepatitis A prevention practices. Parental education, household economic status, access to healthcare services, and home sanitation conditions influence students' understanding and implementation of preventive measures. Families with higher education and economic levels tend to have greater awareness of immunization, hygiene practices, and access to safe food. Family support in providing healthy meals, monitoring handwashing habits, and educating children about health serves as a protective factor against hepatitis A for students who spend significant time outside parental supervision.

Health personnel and teachers play a crucial role in school-based health education to enhance knowledge and modify students' behaviors related to hepatitis A prevention. Active and structured School Health Efforts (UKS) programs provide effective platforms for health promotion, health screening, and hygiene behavior interventions among students. Teacher training as health educators, provision of age-appropriate educational media, and interactive educational activities—such as health talks, handwashing demonstrations, and health campaigns—can improve students' understanding of hepatitis A. Collaboration between the health and education sectors in implementing comprehensive school health programs is key to successful hepatitis A prevention at the school level.

Hepatitis A vaccination is the most effective primary preventive strategy, providing long-term protection against HAV infection. Although the hepatitis A vaccine is safe and effective, achieving seroconversion rates of 95–100% after complete doses, its coverage in Indonesia remains suboptimal as it is not yet part of the national mandatory immunization program. Factors influencing vaccine coverage include parental knowledge, perceptions of vaccine benefits and risks, cost, access to immunization services, and healthcare provider recommendations. Research on factors associated with hepatitis A vaccination decisions among students is important for designing strategies to increase vaccine coverage more effectively and equitably.

A systematic review of studies on factors related to hepatitis A prevention among students is essential to identify current scientific evidence, analyze consistency across studies, and formulate evidence-based recommendations for developing more effective prevention programs. Although numerous studies have been conducted on hepatitis A prevention, comprehensive syntheses integrating interacting factors remain limited. This systematic literature review aims to analyze in depth and systematically the various factors associated with hepatitis A prevention among students, based on a review of twenty relevant scientific journals, identify the strength of relationships between variables, and explore research gaps to guide future studies.

Based on this background, the systematic literature review focuses on answering the research question: What factors are associated with hepatitis A prevention among students according to scientific literature? The study aims to identify, analyze, and synthesize various factors related to hepatitis A prevention among students, including knowledge, attitudes, behaviors, school environment, socioeconomic status, family support, the role of health personnel, and vaccination. The findings are expected to contribute theoretically by enriching knowledge on hepatitis A prevention in

the student population, provide practical recommendations for policymakers in designing school-based hepatitis A prevention programs, and serve as a reference for future researchers to develop evidence-based interventions to enhance hepatitis A prevention effectiveness among students in Indonesia.

RESEARCH METHODS

Research Design

This study employed a Systematic Literature Review (SLR) method to identify, evaluate, and synthesize relevant research findings on factors associated with hepatitis A prevention among students. The SLR design was chosen because it provides a comprehensive summary of the available scientific evidence, identifies research gaps, and offers strong evidence-based recommendations for health practice and policy. The SLR process was conducted systematically, explicitly, and reproducibly, following a structured protocol that included formulating research questions, establishing inclusion and exclusion criteria, developing a literature search strategy, selecting articles, assessing study quality, extracting data, and synthesizing findings. This approach ensures minimal bias in literature selection and analysis, enhances the validity of findings, and produces objective and reliable conclusions to inform the development of hepatitis A prevention interventions for student populations across various educational contexts and settings.

Literature Search Strategy and Selection Criteria

A comprehensive literature search was conducted through multiple international and national electronic databases, including PubMed, Google Scholar, Science Direct, ProQuest, Portal Garuda, and the National Library of the Republic of Indonesia, with a publication range from 2020 to 2024 to ensure relevance and timeliness. Keywords used included combinations of: “hepatitis A,” “HAV,” “prevention,” “siswa,” “students,” “remaja,” “adolescents,” “factors,” “determinants,” “knowledge,” “attitude,” “behavior,” “vaccination,” and “school”, using Boolean operators AND and OR. Inclusion criteria were: original research articles with cross-sectional, cohort, or experimental designs; studies examining factors associated with hepatitis A prevention; study populations consisting of students; published in English or Indonesian; and full-text availability. Exclusion criteria were: review articles, case reports, editorials, or commentaries; studies irrelevant to the research topic; and studies with low methodological quality based on critical appraisal.

Selection Process, Quality Assessment, and Data Analysis

Article selection was conducted in three systematic and independent stages. The first stage involved screening titles and abstracts to identify articles relevant to the research topic according to the established inclusion and exclusion criteria. The second stage involved a full-text review to ensure that each article met all inclusion criteria comprehensively. The third stage involved methodological quality assessment using appropriate critical appraisal tools depending on the study design, such as the Newcastle-Ottawa Scale for observational studies and the Cochrane Risk of Bias Tool for experimental studies. Data were extracted using a standardized extraction form, including information on study characteristics, population and sample, variables examined, measurement methods, main findings, and conclusions. Data analysis was performed narratively by synthesizing findings from the twenty selected articles, identifying emerging patterns and themes, comparing consistency across studies, and presenting the synthesis in both summary tables and comprehensive descriptive narratives to address the formulated research questions.

RESULTS AND DISCUSSION

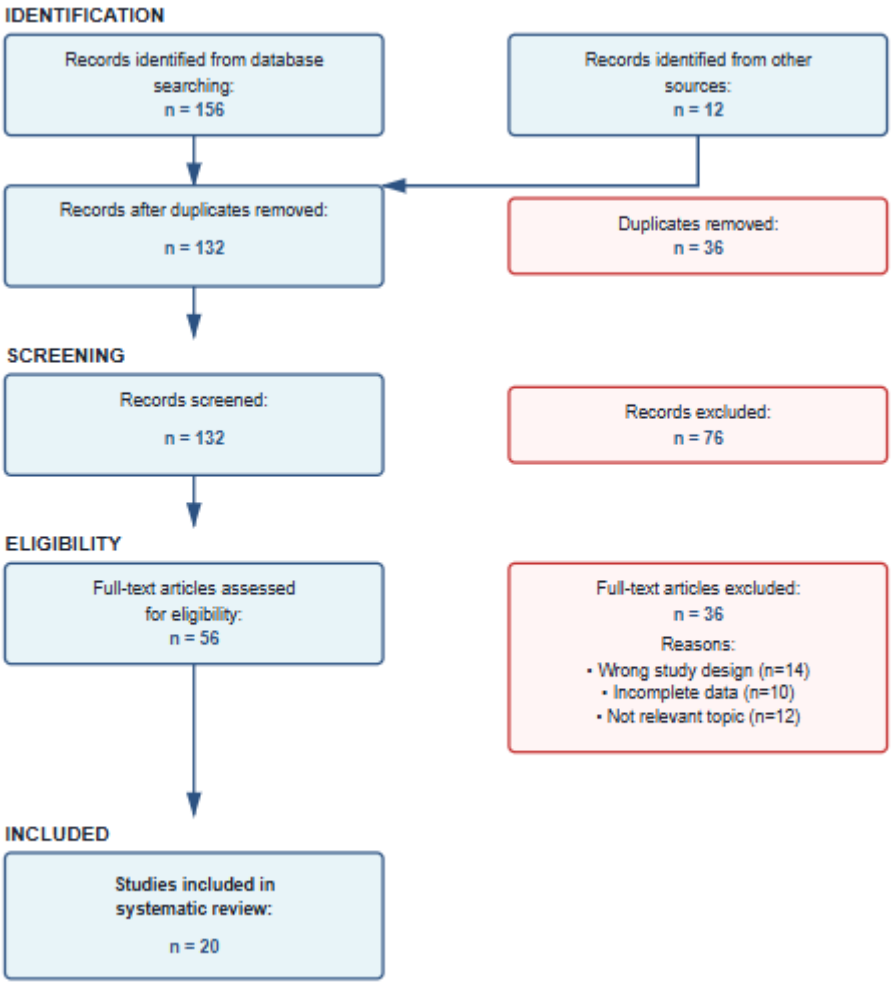

Figure 1. Prisma Flowchart

Table 1. Relevant Research

No	Title & Authors	Year	Study Design	Location	Sample	Variables Studied	Main Findings	Conclusion
1	Analysis of Public Knowledge on Hepatitis A Disease and Vaccine in Indonesia (Ahmad, I., Endarti, D., & Andayani, T.M.)	2020	Observational cross-sectional, multi-center	5 provinces in Indonesia: DIY, Lampung, West Java, Central Kalimantan, and Central Sulawesi	500 respondents (100 per province) – parents of children <2 years	Knowledge about hepatitis A and vaccine; sociodemographic characteristics	Average knowledge score 75.2% ± 12.2% (moderate). Significant differences in those who had heard of the disease (p=0.000), vaccine (p=0.000), and vaccinated children (p=0.000)	Public knowledge about hepatitis A and its vaccine is moderate. Government should implement educational programs on prevention via vaccination
2	HbsAg Screening in Teenagers in Surabaya Using Rapid	2020	Cross-sectional	Surabaya	54 adolescents (19–20 years)	HbsAg, gender, antibody status	94.44% female; no positive HbsAg; all 54 respondents	No hepatitis B cases were found among adolescents

	Test (Alamudi, M.Y., Suwarno, A., & Rahmawati, I.)					negative for hepatitis	studied in Surabaya
3	Hepatitis A Virus in Indonesia and Transmission Risk to Medical Students (Annisa)	2020	Literature review	Indonesia	–	HBV epidemiology, transmission, risk among medical students	HBV prevalence 2.5–10%, medical students at high risk; vaccination and protective standards need improvement	Medical students are at high risk of HBV exposure, requiring vaccination and implementation of protection standards
4	Relationship Between Handwashing, Healthy Snack Consumption, and Sanitary Toilet Use with Hepatitis A in Madrasah Aliyah Raudhatul Huda Al Islami, Pesawaran (Apriliana, F., Sitorus, R.J., & Khoiriyah, N.)	2024	Cross-sectional	Madrasah Aliyah Raudhatul Huda Al Islami, Pesawaran	165 students	Handwashing with soap (HWWS), healthy snack consumption, sanitary toilet use, hepatitis A incidence	22.4% had hepatitis A; significant associations: HWWS (p=0.001; OR=6.80), healthy snack (p=0.011; OR=10.55), sanitary toilet use (p=0.000; OR=10.50)	HWWS, healthy snack consumption, and sanitary toilet use significantly related to hepatitis A incidence
5	Effect of Health Education on Hepatitis Prevention Among Adolescents (Cahyani, D.Y.A.)	2024	Pre-experiment (one-group pre-post test)	SMA Negeri 3 Kediri	36 students	Knowledge before and after education	Knowledge improvement: moderate 18%, good 14%; poor category decreased 42%	Flipchart-based health education effectively increases students' knowledge
6	Analysis of Factors Associated with Hepatitis in Indonesia (Feliansyah, A.W., & Purwanto, E.)	2024	Analytic cross-sectional (secondary SDKI 2017 data)	Indonesia	SDKI 2017 data	Gender, education level, wealth index, hepatitis incidence	Significant associations: gender, education level, wealth index with hepatitis incidence	Sociodemographic factors are associated with hepatitis incidence in Indonesia
7	Extraordinary Hepatitis A Outbreak in SMA X,	2020	Observational cross-sectional	SMA X, Lamongan	50 respondents (34 student	Clinical symptoms, HAV antibodies,	33 students positive; outbreak Nov 2017–Jan 2018; prolonged	Hepatitis A outbreak caused by patient

	Lamongan, 2018 (Harisma, F.B., Sulistyorini, L., & Azam, M.)				s sick, 10 food handlers, 4 teachers)	environment, HWWS, food hygiene	common source curve; risk factors: contact with patients, no HWWS, poor water sanitation, unclean food stalls	contact, lack of HWWS, poor water sanitation, and unhygienic food stalls
8	Risk Factors for Hepatitis A Outbreak in Tangerang, 2016 (Laila, N.H., Mahkota, R., Sariwati, E., & Setiabudi, D.A.)	2020	Case-control (unmatched)	Elementary & Middle Schools, Tangerang	139 (44 cases, 95 controls)	HWWS, canteen type, sanitation behavior	Not washing hands after defecation (OR=7.90) and certain canteen types (OR=2.92) were risk factors	Not washing hands after defecation and canteen type are risk factors for hepatitis A outbreaks
9	Students' Knowledge on Prevention of Acute Mysterious Hepatitis at Politeknik Akbara Surakarta (Laili, N.H., Islami, D.D., & Rasmi)	2022	Cross-sectional	Politeknik Akbara Surakarta	57 students	General hepatitis knowledge, prevention knowledge	64.9% good general hepatitis knowledge; 43.9% adequate prevention knowledge	Students have good general knowledge but need better prevention knowledge
10	Risk Factors for Hepatitis A Outbreak in Pondok Pesantren X, Rokan Hilir, Riau (Mardani, S., Helda, Rajunitrigo, & Muryanto, I.)	2024	Case-control (1:1)	Ponpes X, Rokan Hilir	232 respondents (116 cases, 116 controls)	Contact history, HWWS, water management, nail hygiene	Contact history (OR=9.92), unclean nails (OR=4.64) were dominant risk factors	Contact history and unclean nails are dominant risk factors for hepatitis A outbreaks
11	Hepatitis A Epidemiology Based on Outbreak and Case Data in Bogor, 2019 (Nurjannah, N., & Adisasmita, A.)	2021	Descriptive epidemiology	Bogor	495 hepatitis A cases	Demographics, water source, clinical symptoms, outbreak distribution	Most cases aged 5–14, unsafe water sources, main symptoms fever and nausea	Hepatitis A outbreaks in Bogor influenced by environmental factors, especially water quality
12	Relationship Between Knowledge, Behavior, and Attitudes with Hepatitis A in SMPN 20 Depok	2020	Cross-sectional	SMPN 20 Depok	136 students	Knowledge, behavior, attitude	Knowledge significant (p=0.000); behavior (p=0.184) and attitude (p=0.833) not significant	Knowledge is associated with hepatitis A, behavior and attitude are not

	(Puspita, R.R., Romlah, S.N., & Safitri, R.N.A.D.)							
13	Behavioral Factors Related to Hepatitis A in Depok District, Sleman (Rahmah, S., & Indriani, C.)	2023	Case-control	Depok, Sleman	140 cases, 140 controls	Contact history, handwashing, dishwashing, raw vegetable consumption, utensil sharing, vendor hygiene	Dominant risk factors: contact history (OR=3.17; p=0.00), raw food (OR=3.43; p=0.00), poor vendor hygiene (OR=3.28; p=0.00)	Contact history, raw food consumption, and vendor hygiene are dominant hepatitis A risk factors
14	Adolescents' Knowledge and Prevention Practices for Hepatitis A (Rahman, T., Nuzula, F., & Prayitno, S.H.)	2021	Descriptive correlational cross-sectional	Sumbersari, Jember	50 adolescents	Knowledge level, prevention practices	58% moderate knowledge, 88% good prevention; knowledge significantly related to prevention (p=0.026)	Knowledge is significantly associated with hepatitis A prevention practices
15	Relationship Between Handwashing, Drinking Water Management, and Healthy Homes with Hepatitis in Indonesia (Sari, P.H., Azhar, K., Pradono, J., & Sukoco, N.E.W.)	2020	Analytic (logistic regression) – secondary Riskesdas 2013	Indonesia	835,256 people (≥10 years)	HWWS, water management, healthy home, location, economic status	No HWWS (OR=1.77), unsafe water (OR=1.29), unhealthy home (OR=2.64), rural (OR=1.39), poor (OR=1.45) associated with hepatitis	Handwashing and water management are important factors for hepatitis prevention
16	Relationship Between Personal Hygiene and Hepatitis A in Students/University Students (Sasoka, D.S., & Satyabakti, P.)	2023	Case-control	STDI Imam Syafi'i, Jember	45 (15 cases, 30 controls)	Personal hygiene, knowledge, vaccination, snacking habits	Personal hygiene (OR=5.71, p=0.016) associated with hepatitis A	Poor personal hygiene is a risk factor for hepatitis A
17	Knowledge and Attitude on Hepatitis Prevention Practices in	2024	Cross-sectional	Banjar Padang Tawang	153 respondents	Knowledge, attitude, preventive behavior	72.5% good knowledge, 65.4% good prevention behavior;	Knowledge and attitude are associated with

	the Community (Suantika, K.A.C., Arthini, N.W.S., & Saraswati, L.P.I.W.)						significant relationship between knowledge/attitude and prevention behavior	hepatitis prevention practices
18	Pesantren Environmental Health and Students' Clean and Healthy Lifestyle with Hepatitis Occurrence (Sumarni, I., & Susanna, D.)	2024	Case-control	Pesantren	40 cases, 80 controls	Age, boiled water habit, communal eating, utensil sharing, immunization status	Communal eating (OR=21.48), utensil sharing (OR=6.15), immunization protective (OR=0.056); risk 3.36× if unvaccinated and poor practices	Communal eating and utensil sharing are risk factors; immunization is protective
19	Knowledge of Hepatitis B and High-Risk Behavior with Hepatitis B Occurrence in Adolescents (Suryantoro, S.D., Romadhon, P.Z., Kurniawan, F., Makhfudli, Pramesti, N.A., & Maulida, V.S.)	2023	Cross-sectional	Village X, Gucialit, Lumajang	50 adolescents	Hepatitis B knowledge, high-risk behaviors	Knowledge not significant (p=0.086); high-risk behavior significant (p=0.002)	High-risk behavior is associated with hepatitis B in adolescents
20	Predisposing Factors and Hepatitis A Prevention Practices Among Adolescents in RW 09 Ciateul, Regol, Bandung 2017 (Sutiman, I.A.W., Nuraeni, A., & Kurniawan, T.)	2020	Cross-sectional	RW 09 Ciateul, Regol, Bandung	71 adolescents (total sampling)	Age, education, knowledge, attitude, prevention practice	55% good knowledge; 56% good prevention practice; knowledge significantly associated with practice (p=0.001); age, education, attitude not associated	Knowledge significantly related to hepatitis A prevention practice; age, education, and attitude not associated

Discussion

Study Characteristics Reviewed

Based on the systematic literature review process, a total of 20 research articles met the inclusion criteria and were analyzed comprehensively. The articles were published between 2020 and 2024, with the majority of studies conducted in Indonesia. The research designs varied, including cross-sectional studies (12 articles), case-control studies (5 articles), pre-experimental studies (1 article), and literature reviews (2 articles). The study settings were diverse, encompassing junior high schools, senior high schools, Islamic senior secondary schools (madrasah aliyah), Islamic boarding schools (pesantren), and universities. Sample sizes ranged from 36 to 835,256 respondents, with the primary target populations being students, adolescents, and university students. The variables investigated covered various factors associated with hepatitis A prevention, including knowledge, attitudes, handwashing behavior with soap (HWWS), personal hygiene, food consumption, environmental sanitation conditions, history of contact with hepatitis patients, immunization status, and sociodemographic characteristics.

Knowledge Factors and Their Relationship with Hepatitis A Prevention

Knowledge is a fundamental factor consistently showing a significant relationship with hepatitis A prevention practices among students. Laili et al. [1] found that 64.9% of university students had good general knowledge about hepatitis, yet only 43.9% had adequate knowledge regarding prevention, highlighting a gap between theoretical and practical understanding. Rahman et al. [4] reported a significant relationship between knowledge level and hepatitis A prevention practices ($p=0.026$), where 58% of adolescents had moderate knowledge and 88% implemented effective preventive measures. Similarly, Puspita et al. [5] found a significant association between knowledge and hepatitis A incidence ($p=0.000$). Sutiman et al. [18] confirmed a significant relationship between knowledge and prevention practices ($p=0.001$). Ahmad et al. [15] reported that the knowledge level of the Indonesian population regarding hepatitis and the hepatitis A vaccine was moderate (75.2% ± 12.2%), although gaps remained regarding treatment and national health insurance programs. These findings indicate that enhancing knowledge through structured health education is a crucial strategy for improving hepatitis A prevention practices.

Effectiveness of Health Education Interventions

Health education interventions have been proven effective in increasing students' knowledge of hepatitis A prevention. Cahyani [2] demonstrated that health education using flipcharts significantly improved students' knowledge, with increases of 14% in the "good" knowledge category, 18% in the "moderate" category, and a 42% decrease in the "poor" category. These results suggest that engaging and interactive educational media can optimize student learning. Practically, this underscores the importance of integrating regular health education programs on hepatitis A into school curricula through the School Health Program (UKS), utilizing age-appropriate and interactive educational tools.

Handwashing Behavior (HWWS) Factors

Handwashing with soap is the most consistently and strongly associated factor with hepatitis A prevention. Sari et al. [3], analyzing Riskesdas 2013 data from 835,256 respondents, found that not practicing HWWS increased the risk of hepatitis by 1.77 times (OR=1.77). Laila et al. [9] identified failing to wash hands after defecation as the dominant risk factor in hepatitis A outbreaks (OR=7.90). Apriliana et al. [11] found a significant association between HWWS and hepatitis A incidence ($p=0.001$; OR=6.80). Mardani et al. [6] identified unclean fingernails as a risk factor for hepatitis A outbreaks (OR=4.64), closely related to inadequate handwashing practices. Harisma et al. [16] noted that insufficient handwashing contributed to hepatitis A outbreaks in SMA X, Lamongan. These findings indicate that HWWS, particularly at critical times such as after defecation and before eating, is a simple yet highly effective intervention to interrupt hepatitis A transmission.

Personal Hygiene and Sanitation Behavior Factors

Poor personal hygiene and sanitation behaviors are key risk factors for hepatitis A. Sasoka and Satyabakti [10] found that poor personal hygiene was significantly associated with hepatitis A incidence (OR=5.71; $p=0.016$). Apriliana et al. [11] reported a significant association between using

sanitary toilets and hepatitis A incidence (p=0.000; OR=10.50), indicating that students not using sanitary toilets were 10.5 times more likely to contract hepatitis A. Sumarni and Susanna [12] found that sharing eating utensils (OR=6.15) and communal eating habits (OR=21.48) were significant risk factors in pesantren settings. These findings suggest that hepatitis A prevention interventions should include comprehensive personal hygiene education, covering not only handwashing but also nail hygiene, the use of sanitary toilets, and avoiding sharing personal eating utensils.

Food and Beverage Consumption Factors

Unsafe food and beverage consumption is a major transmission route for hepatitis A. Apriliana et al. [11] found a significant relationship between consuming safe snacks and hepatitis A incidence (p=0.011; OR=10.55), indicating that indiscriminate snacking at school is a high-risk behavior. Rahmah and Indriani [13] reported that consuming raw vegetables or food was a dominant risk factor (OR=3.43; p=0.00), and neglecting vendor hygiene was also a risk factor (OR=3.28; p=0.00). Laila et al. [9] identified certain types of school canteens as a risk factor in hepatitis A outbreaks (OR=2.92). Sari et al. [3] noted that unsafe drinking water management increased hepatitis risk by 1.29 times (OR=1.29). Harisma et al. [16] highlighted poor water sanitation and unhygienic food stalls as contributors to outbreaks. These findings emphasize the importance of food safety supervision in schools, including canteen management and educating students on safe food choices.

History of Contact with Hepatitis Patients

Contact history with hepatitis A patients is a strong risk factor for secondary transmission, especially in schools and pesantren. Mardani et al. [6] identified contact history as the most dominant risk factor in outbreaks (OR=9.92). Rahmah and Indriani [13] also reported contact history as a dominant risk factor (OR=3.17; p=0.00). Harisma et al. [16] highlighted contact with patients as a key factor in prolonged hepatitis A outbreaks at SMA X Lamongan, demonstrating ongoing person-to-person transmission. Practically, these findings underscore the importance of early case detection, patient isolation, contact tracing, and post-exposure immunoglobulin or vaccination to break transmission chains.

School Environment and Sanitation Factors

Inadequate school environment and sanitation are structural risk factors contributing to hepatitis A incidence. Sari et al. [3] found that unhealthy home conditions increased hepatitis risk by 2.64 times (OR=2.64). Harisma et al. [16] identified poor water sanitation as a key outbreak contributor. Sumarni and Susanna [12] reported that environmental health in pesantren, including clean water access, toilet conditions, and occupancy density, influenced hepatitis incidence. These findings indicate that hepatitis A prevention requires comprehensive improvements in school sanitation infrastructure, including clean water access, handwashing facilities, toilet improvements, school canteen hygiene, and regular water quality monitoring.

Attitude Factors and Inconsistencies

Attitude factors yielded inconsistent results regarding hepatitis A prevention. Puspita et al. [5] found no significant relationship between attitude and hepatitis A incidence (p=0.833), and Sutiman et al. [18] reported similar findings regarding prevention practices. This suggests that positive attitudes do not automatically translate into consistent preventive behaviors, aligning with the attitude-behavior gap theory. Thus, interventions must not only foster positive attitudes but also address behavioral barriers, improve practical skills, and create supportive environments.

Immunization Status as a Protective Factor

Hepatitis A vaccination is a critical protective factor. Sumarni and Susanna [12] found immunization status to be protective (OR=0.056), indicating a 94.4% lower risk among vaccinated individuals. Unvaccinated individuals faced a 3.36 times higher risk, especially when combined with other risk factors. Ahmad et al. [15] reported significant differences in parental knowledge about hepatitis A vaccination between vaccinated and unvaccinated children (p=0.000). Annisa [8] emphasized vaccination for high-risk populations. Alamudi et al. [14] found no hepatitis B cases among adolescents studied in Surabaya, likely due to integrated immunization programs. These

findings indicate that vaccination is the most effective primary prevention strategy, warranting advocacy for including hepatitis A vaccines in school immunization programs, particularly in high-incidence areas.

Socioeconomic and Geographic Factors

Socioeconomic status and geographic location influence hepatitis A risk through their impact on access to sanitation facilities and hygienic behavior. Sari et al. [3] found that poor economic status increased hepatitis risk by 1.45 times (OR=1.45), and living in rural areas increased risk by 1.39 times (OR=1.39). These findings align with social determinants of health theory, emphasizing that socioeconomic conditions affect health status via multiple pathways. Preventive efforts should consider social context and target high-risk groups, including students from low-income families and rural areas, through interventions such as subsidized vaccination, school sanitation improvements, and healthy meal programs.

Synthesis of Factors Related to Hepatitis A Prevention

Based on the synthesis of 20 reviewed articles, hepatitis A prevention among students is influenced by a complex interplay of individual, behavioral, environmental, and social factors. The factors with the strongest and most consistent evidence include: Handwashing with soap, Personal hygiene, History of contact with hepatitis patients, Unsafe food and beverage consumption, Use of unhygienic toilets, Sharing eating utensils, School environmental sanitation, Immunization status as a protective factor. Knowledge shows a significant relationship, although its link to behavior is not always linear. Attitude yielded inconsistent results. Socioeconomic and geographic factors act as structural determinants. Effective prevention requires a comprehensive, multi-level approach, targeting both individual behavior change and supportive environments and policies.

CONCLUSIONS

The systematic literature review of 20 research articles demonstrates that hepatitis A prevention among students is influenced by multiple interacting factors. The most strongly and consistently associated factors are handwashing with soap (HWWS), personal hygiene, history of contact with hepatitis patients, unsafe food and beverage consumption, use of unhygienic toilets, sharing eating utensils, and school environmental sanitation. Knowledge shows a significant association with prevention practices, whereas attitude results are inconsistent. Immunization is the most effective protective factor, reducing risk by up to 94.4%. Socioeconomic and geographic factors act as structural determinants affecting access to sanitation and health behaviors. Effective prevention requires a comprehensive, multi-level strategy integrating health education interventions, improvements in school sanitation infrastructure, food safety oversight, promotion of clean and healthy behaviors, and advocacy for hepatitis A vaccination programs, particularly for high-risk student populations in endemic areas.

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