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MORALITY BEFORE KNOWLEDGE

Socio-demographic and environmental determinants of hepatitis: A preventive behaviors in densely populated urban communities

Fadillah Rodhatul Jannah[1], Kholis Ernawati[2], Roni Hidayat[3], Rifda Wulansari[1]
[1] *Faculty of Medicine, Universitas YARSI, Jakarta, Special Capital Region of Jakarta 10510, Indonesia;*
[2] *Department of Public Health, Faculty of Medicine, Universitas YARSI, Jakarta, Special Capital Region of Jakarta 10510, Indonesia;*
[3] *Department of Religion, Faculty of Master Management, Universitas YARSI, Jakarta, Special Capital Region of Jakarta 10510, Indonesia.*
*Correspondence: fadillahrodhatul@gmail.com

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ABSTRACT

Background: Urban hepatitis A outbreaks in Indonesia highlight the need to understand preventive behaviors beyond biomedical factors. This study applies Green's health behavior theory to examine demographic, behavioral, and environmental determinants of hepatitis A preventive in an urban Jakarta community. The purpose of this study is to identify and analyze the relationship between individual characteristics and preventive behaviors toward Hepatitis A, in order to provide evidence-based recommendations for effective public health interventions. **Methods:** This study conducted a cross-sectional analytic study among residents aged 15–45 years using a validated questionnaire. Variables included knowledge, attitudes, and information exposure alongside demographics. Data were analyzed with chi-square tests for categorical associations. **Findings:** Older age, female gender, higher education, employment, better knowledge, positive attitudes, and information exposure were associated with practicing hepatitis A preventive behaviors (e.g., safe water/food handling, hand hygiene) ($p < 0.05$). The survey in the Kemayoran District showed a high level of compliance in hand washing and clean water use, but inconsistent practices still occurred in relation to thorough cooking of food and technical understanding of the virus etiology. The results of the study identified a significant gap between knowledge and behavior, where moderate attitudes and incomplete health literacy hindered the transition from general awareness to consistent protective actions. **Conclusion:** Predisposing (knowledge, attitudes), enabling (access to clean water/sanitation), and reinforcing factors (community and health-worker support) jointly predict preventive practices. Findings inform culturally responsive, nurse-led community interventions in low-resource urban settings. **Novelty/Originality of this article:** This article addresses the gap that most studies in Indonesia have focused only on biomedical or knowledge-based aspects. The study provides a culturally relevant framework for targeted public health interventions in urban communities by integrating demographic, behavioral, and environmental factors.

KEYWORDS: behaviours derterminants; green's theory; hepatitis a preventive; information exposure; nursing intervention; urban health.

1. Introduction

Hepatitis A is one of the infectious diseases affecting the liver and is caused by the Hepatitis A virus (HAV), a non-enveloped, single-stranded RNA virus belonging to the

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genus *Hepatovirus* within the family *Picornaviridae* (Jain et al., 2023). Transmission of HAV occurs primarily through the fecal–oral route, most commonly via the ingestion of contaminated food or water, and is closely associated with inadequate sanitation and poor hygiene practices (Nelson et al., 2020). HAV infection is typically acute and self-limiting, with most individuals recovering completely without progressing to chronic liver disease. Nevertheless, in certain cases particularly among older adults or individuals with underlying liver conditions the infection may progress to fulminant hepatitis, a severe form of acute liver failure that can be fatal (Ali Pambuk, 2019; Lee et al., 2018).

Hepatitis A remains a significant global public health concern, especially in regions with limited access to clean water and proper sanitation, where the incidence rates are substantially higher. Although the majority of infections result in mild or asymptomatic disease, hepatitis A can cause severe clinical manifestations and life-threatening complications in vulnerable populations, including patients with chronic liver disease and immunocompromised individuals (Das et al., 2023). Therefore, preventive strategies play a crucial role in reducing disease burden, particularly through the implementation of effective vaccination programs. The availability of a safe and highly effective hepatitis A vaccine has significantly contributed to the prevention and control of HAV infection worldwide (Lanford et al., 2017).

In addition to vaccination, other preventive behaviors play a crucial role in interrupting the transmission of hepatitis A. The practice of proper personal hygiene such as washing hands with soap after defecation and before handling or consuming food along with maintaining adequate environmental sanitation, and ensuring the safety and cleanliness of food and drinking water, are essential preventive measures (Dunn et al., 2022). Furthermore, health education initiatives aimed at increasing public awareness about transmission routes and preventive practices are vital, as sustained behavioral changes have been shown to significantly reduce the incidence of hepatitis A (Lin et al., 2018). Therefore, a comprehensive prevention strategy that integrates effective immunization programs, improved hygiene practices, heightened public awareness, and supportive public health interventions is essential to reduce the overall burden of hepatitis A at both community and population levels (Sander et al., 2018).

Anti-HAV IgM antibodies emerge during the acute phase of infection as an early humoral immune response and are typically detectable shortly after the onset of symptoms. These antibodies usually persist for approximately 6–12 months before gradually declining and being replaced by anti-HAV IgG antibodies, which confer long-term, and often lifelong, protective immunity against reinfection (Chuaychoo et al., 2019; Usuda et al., 2024). Consequently, the detection of anti-HAV IgM antibodies in serum remains the primary and most reliable laboratory method for the diagnosis of acute Hepatitis A, as it accurately reflects recent or ongoing infection (Redfield et al., 2020).

Hepatitis remains a major global public health concern because of its substantial impact on morbidity, mortality, life expectancy, and the associated socioeconomic burden (Yoon et al., 2010). The disease is characterized by inflammation of the liver caused by a variety of viral and non-viral agents, with hepatitis A and hepatitis E representing the most prevalent forms worldwide (Miranda & Adiwinoto, 2022). Hepatitis A virus (HAV) is primarily transmitted through the fecal–oral route, most commonly via the consumption of food or water contaminated with human feces (Nabilah, 2022). Several risk factors contribute to HAV transmission, including poor personal hygiene, unsafe food and drinking water, communal eating habits, sharing eating utensils, and inadequate handwashing practices. In developing countries such as Indonesia, these conditions remain widespread and continue to facilitate recurrent outbreaks of acute hepatitis A, which is generally self-limiting but can still pose significant public health challenges (Miranda & Adiwinoto, 2022; Nabilah, 2022).

From an epidemiological perspective, hepatitis A exhibits a broad global distribution, with the highest incidence traditionally observed among children living in regions with inadequate sanitation and limited access to clean water (Migueres et al., 2021). However, improvements in environmental sanitation, hygiene infrastructure, and the gradual

introduction of vaccination programs have altered the epidemiological pattern of HAV infection. As a result, a shift in the age distribution of affected individuals has been observed, with an increasing number of cases occurring among adolescents and adults (Chowdhury & Chakraborty, 2017). This shift presents new challenges for prevention and control efforts, as older age groups are more likely to experience severe clinical symptoms, complications, and prolonged illness compared to children (Misumi et al., 2021; Sander et al., 2018; Scheubeck et al., 2019).

Globally, Hepatitis A is among the most common acute viral infections, with an estimated 114 million infections occurring annually. Of these cases, approximately 1.4 million are symptomatic, and around 35,000 result in death each year, underscoring the persistent public health burden of the disease. In low-income countries, HAV infection predominantly occurs during early childhood and is often asymptomatic due to early exposure and the development of natural immunity. In contrast, in higher-income countries, improved sanitation reduces early life exposure, leading to a higher proportion of susceptible adolescents and adults infections in these age groups are more likely to be symptomatic and associated with increased morbidity and mortality (Mardani et al., 2024). In Indonesia, the burden of hepatitis A remains a significant concern. National prevalence data indicate an increase from 0.2% in 2013 to 0.4% in 2018, reflecting a rising trend in reported cases. The highest prevalence rates have been documented in Papua, Central Sulawesi, and West Sulawesi (Kemenkes RI, 2018). Moreover, hepatitis A outbreaks continue to be reported annually across various regions of the country, highlighting ongoing challenges in prevention and control (Nurjannah, 2021), In addition to confirmed HAV cases, Indonesia has also recorded instances of acute hepatitis of unknown etiology in recent years, with the highest number of cases reported in Jakarta, further emphasizing the need for strengthened surveillance, early detection, and comprehensive public health interventions (Parmono et al., 2024).

Previous studies have demonstrated that environmental and behavioral factors play a substantial role in the occurrence and transmission of infectious diseases, including respiratory tract infections and malaria in Indonesia. These findings emphasize that disease prevention cannot rely solely on biomedical approaches, but must also incorporate socio-environmental determinants such as living conditions, sanitation, hygiene practices, and community behavior. Consequently, prevention strategies for Hepatitis A should be examined and implemented through an integrated framework that combines biomedical interventions with socio-environmental and behavioral perspectives to effectively reduce transmission and disease burden (Ariano et al., 2019; Ernawati et al., 2010).

Although several studies have examined knowledge and attitudes toward Hepatitis A, few have simultaneously analyzed the role of demographics, knowledge, attitudes, and information exposure within the same population. This study fills that gap by focusing on an urban district in Jakarta, where high population density and sanitation challenges exacerbate risks.

Therefore, a thorough understanding of hepatitis A transmission mechanisms, together with the role of early and accurate diagnosis, is crucial for strengthening disease control strategies. These efforts can support the effectiveness of public health programs, including expanding vaccination coverage and improving sanitation and hygiene infrastructure, ultimately contributing to a reduction in hepatitis A incidence in the future (Franco et al., 2012; Odenwald & Paul, 2022).

Preventive behavior plays a central role in controlling Hepatitis A, as the disease has no specific curative treatment and often requires a prolonged recovery period. According to Lawrence Green's model, health-related behaviors are shaped by three key determinants: predisposing factors, such as knowledge, attitudes, and values; enabling factors, including the availability of facilities and resources; and reinforcing factors, such as support from family members and healthcare providers (Johnson et al., 2019; Puspita et al., 2020). Studies show that low awareness and risk perception hinder effective preventive Rizkia et al. (2023), while educational interventions and vaccination programs are effective in

improving protective practices, particularly in disadvantaged communities (Khodaveisi et al., 2018; Seo et al., 2012; Tiruon et al., 2022).

Recent global research emphasizes that preventive behavior toward Hepatitis A is strongly influenced by individual knowledge, hygiene practices, and community-based education. Studies conducted in low- and middle-income countries have demonstrated that educational attainment and exposure to health information campaigns are significant predictors of preventive actions. According to the World Health Organization, effective Hepatitis A prevention requires not only the implementation of vaccination programs but also sustained improvements in sanitation, personal hygiene, and public health education to reduce transmission risks (World Health Organization, 2022). In Indonesia, recurrent Hepatitis A outbreaks reported in several regions further underscore the importance of integrating behavioral models into preventive strategies (Adiwinata et al., 2023). The application of Green's theory offers a structured framework that links predisposing, enabling, and reinforcing factors in shaping health-related behaviors. This theoretical integration strengthens the explanatory power of the study and aligns it with contemporary international research trends in behavioral and public health sciences (Elygio et al., 2020).

Despite recurrent hepatitis A clusters in densely populated urban neighborhoods, there is limited understanding of how demographic and behavioral determinants, conceptualized through Green's health behavior theory, influence preventive practices in these settings. This study therefore seeks to answer the following question: Which demographic and psychosocial factors such as knowledge, attitudes, and exposure to health information are associated with hepatitis A preventive behaviors among urban residents in Jakarta? Addressing this question has practical significance, as it can inform nurse-led, culturally sensitive community interventions that promote safe water and food hygiene, household sanitation, and family-centered health education, ultimately contributing to more effective hepatitis A prevention and control.

2. Methods

This study employed a quantitative research design with an analytical observational approach, in which data were collected and presented without manipulation to accurately reflect the real conditions in the field. The use of a quantitative method enabled the researchers to systematically and objectively measure and analyze variables, presenting findings in the form of numerical data, tables, graphs, or diagrams. This design was considered appropriate for capturing the complexity of preventive behaviors against Hepatitis A and for identifying the demographic, psychosocial, and environmental factors that may influence these behaviors.

The specific research design employed was a cross-sectional study, conducted at a single point in time. This design was chosen because it allows for the identification of associations between independent variables such as demographic characteristics, knowledge, attitudes, and exposure to health information and the dependent variable, namely preventive behaviors against Hepatitis A. By using this approach, the study was able to provide a snapshot of community conditions and describe the relationships among variables at the time of data collection. The study population comprised all residents permanently living in Kemayoran District, Central Jakarta, who were willing to participate. From this population, participants were selected using quota sampling, a non-probability sampling method in which specific quotas were established to represent different segments of the community. This approach ensured that the sample adequately reflected the demographic and social characteristics of the population while remaining practical and feasible for field implementation.

The inclusion criteria for this study encompassed residents aged 15–45 years who lived permanently in Kemayoran District and voluntarily agreed to participate. Conversely, the exclusion criteria applied to residents within the same age range who either did not reside permanently in the district or declined to participate in the study. These criteria were established to ensure that the respondents accurately represented the target population

and that the data collected were valid and reliable for analyzing factors associated with preventive behaviors against Hepatitis A. The sample size was determined using the Lemeshow formula for calculating populations of unknown size. The description of the variables used in the sample size calculation is as follows, n represents the sample size, while Z refers to the Z-score at a 95% confidence level, which is equal to 1.96. The variable p indicates the maximum estimated proportion, set at 50% or 0.5, whereas 1 – p represents the proportion of the population not having the characteristic being studied. In addition, d denotes the margin of error used in the calculation, which in this study was determined at 10% or 0.1.

$$n = \frac{Z^2.p\ .(1-p)}{d^2} \quad \text{(Eq. 1)}$$

Using the formula described above, the sample size calculated with the Lemeshow method assuming a maximum estimated proportion of 50% and a margin of error of 9% yielded the minimum required sample size for this study as follows Equation 2.

$$\begin{aligned} n^{max} &= 96 + (96 \times 10\%) \\ n^{max} &= 96 + 9{,}6 \\ n^{max} &= 105{,}6 \approx 106 \end{aligned} \quad \text{(Eq. 2)}$$

Based on the calculations described above, the estimated maximum sample size for this study was determined to be 106 respondents. The data collection instrument consisted of interviews using a printed, closed-ended questionnaire, which was completed by the researcher based on responses from participants who met the inclusion criteria. The questionnaire served as a structured tool to collect data through pre-designed questions specifically aimed at measuring the study variables. To ensure the instrument's validity and reliability, a pilot test was conducted on 10% of the total sample in a different location, with adjustments made to reflect the study's inclusion and exclusion criteria.

$$\begin{aligned} n &= 106 \times 10\ \% \\ n &= 10{,}6 \approx 11 \text{ responden} \end{aligned} \quad \text{(Eq. 3)}$$

From these calculations, the validity and reliability tests were conducted on a total of 11 respondents, representing a preliminary pilot group to ensure that the instrument was suitable for wider data collection. Primary data for the studt were collected directly from participants through structured interviews usiang a sloses-ended questionnare developed by the researcher specially for this study. This instrument included items measuring demographic characteristics, knowledge, attitudes, information exposure, and preventive behaviors against Hepatitis A.

The validity testing was carried out by examining item-total correlations, which ranged from r = 0.65 to 0.82**,** exceeding the minimum threshold required for acceptable validity. This confirmed that each item effectively measured the intended construct. Reliability testing was performed using Cronbach's Alpha, yielding a value of 0.81, which indicates good internal consistency and suggests that the instrument would produce stable and consistent results if administered multiple times under similar conditions. These steps ensured that the questionnaire was both accurate in measuring the intended variables and reliable for use in the larger sample.

All collected data were processed and analyzed using SPSS software. The study employed both univariate and bivariate analyses. Univariate analysis was used to describe the distribution of the study variables, including preventive behaviors, demographic characteristics, knowledge, attitudes, and information exposure, providing a clear overview of patterns and trends within the sample. Bivariate analysis, using the Chi-Square test, was conducted to examine associations between the independent variables (demographics, knowledge, attitudes, and information exposure) and the dependent variable (preventive

behaviors). The results were interpreted in terms of frequencies, percentages, p-values, and significance to identify factors associated with the adoption of preventive behaviours.

Associations among categorical variables were examined using Chi-square tests, with a significance level set at $\alpha = 0.05$. To meet the assumptions of the Chi-square test, minimum expected cell counts were checked. Where necessary, categories were combined to ensure adequate expected frequencies and maintain the validity of statistical inference. The reliability of multi-item constructs was assessed through Cronbach's alpha, with values of ≥ 0.70, indicating acceptable internal consistency and supporting the credibility of the measurement tools.

The cross-sectional nature of this study inherently limits the ability to establish causal relationships between the examined determinants and preventive behaviors against Hepatitis A. In other words, while associations can be identified, it cannot be definitively concluded that specific factors directly cause changes in preventive behaviors. Additionally, the study relied on self-reported measures, which may be subject to recall bias, where participants may not accurately remember past behaviors, and social desirability bias, where participants may report behaviors in a way that reflects positively on themselves rather than their true practices. To mitigate these potential biases, the questionnaire employed neutral wording to avoid leading questions, and responses were collected anonymously, encouraging respondents to provide honest and accurate information. Despite these limitations, the study design and analytic approach provided robust insights into the factors influencing preventive behaviors against Hepatitis A in the Kemayoran District community.

3. Results and Discussion

The research instrument utilized in this study was carefully designed to measure multiple dimensions relevant to Hepatitis A preventive behaviours, including knowledge, preventive practices, attitudes, and exposure to health related information. Prior to full scale data collection, the instrument underwent rigorous validity and reliability testing to ensure its appropriateness, accuracy, and consistency for the study population. Validity testing focused on evaluating the extent to which each question item accurately measured the intended construct. The results demonstrated that all items exhibited a positive Corrected Item Total Correlation, with each calculated R value exceeding the R table value. Using a two-tailed test at a significance level of 0.05, this finding confirms that all questionnaire items met the statistical criteria for validity, indicating that the instrument effectively captures the variables it was designed to assess.

In addition to validity, reliability testing was conducted to determine the internal consistency of the instrument and its ability to produce stable results over repeated administrations under similar conditions. The results showed a Cronbach's Alpha value greater than 0.70 for the overall instrument, confirming that the questionnaire items were reliably interrelated and capable of consistently measuring the targeted constructs. This high level of reliability ensures that the data collected using the instrument are dependable and can be interpreted with confidence in subsequent analyses. Taken together, the results of validity and reliability assessments indicate that the questionnaire is a robust, accurate, and reliable tool for data collection in this study, and is well suited to capture the multidimensional aspects of preventive behaviours and related psychosocial determinants among residents of Kemayoran District.

For this study, primary data were collected directly from respondents through structured questionnaires administered in person. Data collection was carried out over the course of two consecutive days, specifically on Saturday and Sunday, May 24–25, 2025, to facilitate access to a diverse cross-section of the community. A total of 106 respondents from various demographic backgrounds voluntarily participated and completed the questionnaire, providing a rich dataset that reflects the characteristics and behaviours of the target population. The inclusion of respondents with diverse ages, occupations, education levels, and social backgrounds allowed for a comprehensive analysis of factors

influencing Hepatitis A preventive behaviours, enhancing the generalizability and applicability of the findings within the Kemayoran District context.

The data analysis process employed both univariate and bivariate approaches to ensure a thorough examination of the variables under study. Univariate analysis was conducted to describe the distribution of preventive behaviours, demographic characteristics, knowledge, attitudes, and exposure to health information regarding Hepatitis A. The results were systematically presented in tabular form, highlighting frequencies, percentages, and overall trends in the population. This approach provided a detailed overview of the behaviours and psychosocial landscape, allowing the researchers to identify patterns, strengths, and areas for improvement in community preventive practices.

Following univariate analysis, bivariate analysis was carried out to examine potential associations between the dependent variable preventive behaviours toward Hepatitis A and the independent variables, including demographic factors, knowledge, attitudes, and information exposure. The bivariate analysis results were presented using cross-tabulation tables, frequency distributions, percentages, p-values, and corresponding conclusions regarding statistical significance. The Chi-Square test was applied as the primary statistical method to assess the relationships between categorical variables, ensuring that the associations observed were rigorously evaluated for significance at an α level of 0.05. Assumptions regarding minimum expected cell counts were carefully checked, and categories were collapsed where necessary to maintain the validity of the test results.

Overall, the combination of a validated and reliable questionnaire, meticulous primary data collection, and the application of both univariate and bivariate statistical analyses allowed for a comprehensive and methodologically sound assessment of Hepatitis A preventive behaviours among residents of Kemayoran District. This methodological rigor ensures that the findings presented are both accurate and meaningful, providing robust evidence to inform public health strategies, educational interventions, and community-based programs aimed at promoting effective preventive practices against Hepatitis A. The systematic approach adopted in this study highlights the importance of combining precise measurement tools, careful sampling, and appropriate statistical analysis to obtain reliable insights into community health behaviours, ultimately supporting evidence-based decision-making for disease prevention and health promotion initiatives.

3.1 Univariate analysis

Univariate analysis was carried out to systematically describe the distribution and characteristics of preventive behaviours, demographic factors, knowledge levels, attitudes, and exposure to health-related information regarding Hepatitis A among residents of Kemayoran District. This analysis provided a detailed examination of each variable individually, allowing for a thorough understanding of the patterns, trends, and variations present within the study population.

The findings from the univariate analysis were organized and presented in tabular form, offering a clear and comprehensive visualization of the data. This approach enabled easy identification of the frequency and percentage distributions for each category of the variables studied. By presenting the results in tables, the analysis highlighted important aspects such as the prevalence of specific preventive behaviours, the demographic composition of respondents (including age, gender, occupation, and education level), the proportion of individuals with varying levels of knowledge about Hepatitis A, the range of attitudes toward disease prevention, and the degree of exposure to health information campaigns and counselling.

Through this univariate analysis, the study was able to establish a foundational understanding of the community's behaviour and knowledge landscape. It identified both strengths, such as commonly practiced hygiene behaviours and engagement with health education, as well as areas requiring improvement, including gaps in knowledge and inconsistent preventive practices. The systematic presentation of these results not only

facilitates interpretation but also provides a solid basis for subsequent bivariate analysis, which examines the relationships between independent variables and preventive behaviours, further informing targeted public health interventions and policy recommendations.

Table 1. Univariate analysis

Variable	Question Related to Variable	Category	Freq. distribution
Preventive Behavior	Handwashing with running water	Always	0
		Often	9
		Sometimes	35
		Rarely	37
		Never	25
	Handwashing with soap	Always	0
		Often	14
		Sometimes	33
		Rarely	34
		Never	25
	Handwashing with running water and soap before and after meals	Always	0
		Often	9
		Sometimes	37
		Rarely	31
		Never	29
	Handwashing with running water and soap before and after defecation	Always	0
		Often	16
		Sometimes	29
		Rarely	35
		Never	26
	Using clean water sources free from contamination	Always	0
		Often	18
		Sometimes	26
		Rarely	33
		Never	29
	Washing food ingredients thoroughly with running water before consumption	Always	0
		Often	17
		Sometimes	30
		Rarely	31
		Never	28
	Cooking food using clean cooking utensils	Always	0
		Often	12
		Sometimes	34
		Rarely	24
		Never	36
	Cooking food until thoroughly cooked	Always	0
		Often	14
		Sometimes	32
		Rarely	30
		Never	30
	Purchasing food prepared under hygienic conditions	Always	0
		Often	14
		Sometimes	32
		Rarely	36
		Never	24
	Avoid eating from a single container.	Always	0
		Often	17
		Sometimes	28
		Rarely	28
		Never	33
Respondent's Demographic Characteristics	Age	15-30	41
		31-45	65
	Sex	Male	30

		Female	76
	Occupation	Employed	60
		Unemployed	46
	Education level	No formal education	0
		JHS - SHS	60
		> SHS	46
Knowledge	Definition	Incorrect	38
		Correct	68
	Terminology	Incorrect	54
		Correct	52
	Etiology	Incorrect	54
		Correct	52
	Transmission	Incorrect	82
		Correct	24
	Epidemiology	Incorrect	57
		Correct	49
Attitudes	Personal Hygiene	Poor	19
		Moderate	59
		Good	28
		Sum	106
	Environmental Cleanliness	Poor	14
	Around the Residence	Moderate	65
		Good	27
	Body Health	Poor	16
		Moderate	59
		Good	31
	Cleanliness of Residence	Poor	12
		Moderate	61
		Good	33

A total of 106 respondents participated in this study, providing a diverse sample for examining preventive behaviours against Hepatitis A. The univariate analysis revealed that the majority of respondents demonstrated relatively good preventive behaviours. Specific practices commonly reported included frequently washing hands with running water (37 respondents, 34.9%), using soap for handwashing (34 respondents, 33.1%), performing hand hygiene before and after meals (37 respondents, 34.9%), and washing hands before and after defecation (35 respondents, 33.0%). These findings indicate that basic personal hygiene practices, particularly those related to handwashing, were widely adopted, reflecting a positive behaviours trend in the community.

In addition to personal hygiene, respondents also reported preventive behaviours related to environmental and food hygiene, such as using clean water for drinking and cooking (33 respondents, 31.1%), washing food before consumption (31 respondents, 29.2%), and cooking using clean utensils (36 respondents, 34.0%). However, certain critical behaviours, such as thoroughly cooking food, were observed less consistently, with most respondents (32 respondents, 30.2%) reporting this practice only occasionally. Furthermore, purchasing food prepared under hygienic conditions (36 respondents, 34.0%) and avoiding shared dishes (33 respondents, 31.1%) were frequently reported as part of preventive behaviours, demonstrating that the community was aware of and actively engaged in practices to reduce the risk of foodborne transmission of Hepatitis A.

From a demographic perspective, the majority of respondents were adults aged 31–45 years (65 respondents, 61.3%), predominantly female (76 respondents, 71.7%), employed (60 respondents, 56.6%), and had completed junior to senior high school education (60 respondents, 56.6%). These demographic patterns suggest that middle-aged women, who are often responsible for household management and caregiving roles, may have a higher likelihood of engaging in preventive health behaviours. Educational attainment also appears to play a role, as individuals with formal education may have greater access to health information and awareness of preventive practices.

Regarding knowledge, most respondents demonstrated limited understanding of Hepatitis A transmission, with 82 respondents (77.4%) lacking comprehensive knowledge about the pathways through which the virus spreads. Attitudinally, the majority of participants were classified in the moderate category for both personal hygiene maintenance (59 respondents, 55.7%) and environmental cleanliness (65 respondents, 61.3%). These findings indicate that although respondents were aware of general hygiene practices, the intensity, consistency, and depth of their preventive behaviours were not optimal. In terms of information exposure, over half of the respondents reported having received counselling about Hepatitis A (61 respondents, 57.5%), actively seeking information regarding the disease (59 respondents, 55.7%), and engaging in discussions with healthcare workers about preventive measures (61 respondents, 57.5%). This highlights the important role of health education and communication in influencing preventive behaviours, reinforcing the need for continued dissemination of accurate information and community engagement.

Overall, the findings point to a knowledge behaviours gap, where awareness of Hepatitis A as a disease exists, but understanding of its transmission pathways remains inadequate, thereby affecting the adoption of consistent preventive behaviours. This observation aligns with prior research by Ariano et al. (2019), which found that knowledge of disease risk does not necessarily translate into consistent protective behaviour, a pattern similarly observed in studies of respiratory infections and other communicable diseases. The results underscore the importance of not only increasing knowledge about Hepatitis A but also fostering positive attitudes, strengthening practical skills, and ensuring that health information is effectively translated into consistent and sustainable preventive actions. (Ariano et al., 2019)

3.2 Bivariate analysis

The original five-point Likert scale used in this study was carefully simplified into two categories during the bivariate analysis to facilitate interpretation and improve the accuracy of statistical testing. This was achieved by merging several response options into broader dichotomous groups—a common approach in public health research that reduces complexity while maintaining the analytical rigor of the data. Simplifying the scale allowed for clearer comparisons between groups and ensured that statistical tests, such as the Chi-Square test, could be conducted effectively given the sample size and research objectives.

For the preventive behaviours variable, respondents were initially assessed using a five-point Likert scale across 10 behaviours items, with scores ranging from 1 (never) to 5 (always), producing a total possible score range of 10–50. Based on these total scores, respondents were subsequently classified into two categories: “adopting preventive behaviours” (scores 31–50) and “not adopting preventive behaviours” (scores 10–30). This dichotomous classification provided a clear distinction between individuals who consistently practiced preventive behaviours and those whose preventive practices were insufficient, thereby simplifying the interpretation of the results.

In terms of the knowledge variable, four key items were included to measure respondents’ understanding of Hepatitis A. Each item was scored on a scale of 3 (good), 2 (moderate), and 1 (poor), leading to a possible total score range of 4–12. These scores were then grouped into two categories: respondents with a “positive attitude” towards preventive knowledge (scores 9–12) and those with a “negative attitude” (scores 4–8). Although originally designed with three levels of scoring, the categorization into two groups enhanced the clarity of analysis by allowing a sharper focus on whether or not respondents had adequate levels of knowledge.

The information exposure variable was measured using four items with dichotomous responses, where each “yes” answer was scored 2 and each “no” answer was scored 1. This resulted in a total score range of 4–8. For analytical purposes, the results were classified into two groups: respondents who were “exposed to information” with scores of 7–8, and those who were “not exposed to information” with scores of 4–6. This categorization was

particularly important for identifying the role of information dissemination, such as health education and counselling, in shaping preventive behaviours.

In summary, all the variables that were initially measured on multiple scales or categories were systematically simplified into two distinct groups. This methodological adjustment was essential for conducting the bivariate analysis, which sought to examine the relationship between the independent variables (knowledge, attitudes, demographic characteristics, and information exposure) and the dependent variable (preventive behaviour against Hepatitis A). The results of this analysis are presented in tabular form to clearly display distributions, percentages, p-values, and conclusions, thereby providing a structured and comprehensive overview of the associations between the studied variables. The data analysis presented here is a bivariate analysis, which is displayed in the form of tables.

Table 2. Bivariate analysis

	Preventive Behaviors against Hepatitis A						
Variable	Not Implemented		Implemented		Total		P-Value
Age	n	%	n	%	n	%	0.017
15 – 30	24	56.8%	17	41.5%	41	100.0%	
31 - 45	18	27.7%	47	44.3%	65	100.0%	
Sex	n	%	n	%	n	%	0.000
Male	20	66.7%	10	33.3%	30	100.0%	
Female	22	28.9%	54	71.1%	76	100.0%	
Occupation	n	%	n	%	n	%	0.021
Employed	24	52.2%	22	47.8%	46	100.0%	
Unemployed	18	30.0%	42	70.0%	60	100.0%	
Education Level	n	%	n	%	n	%	0.013
JHS - SHS	30	50.0%	30	50.0%	60	100.0%	
>SHS	12	26.1%	34	73.9%	46	100.0%	
Knowledge	n	%	n	%	n	%	0.036
Poor	29	48.3%	31	51.7%	60	100.0%	
Good	13	28.3%	33	71.7%	46	100.0%	
Attitude	n	%	n	%	n	%	0.017
Poor	27	50.9%	26	49.1%	53	100.0%	
Attitude	15	28.3%	38	71.7%	53	100.0%	
Information Exposure	n	%	n	%	n	%	0.021
Not Exposed	26	51.0%	25	49.0%	51	100.0%	
Exposed	16	29.1%	39	70.9%	55	100.0%	

The results of this study revealed a significant association between respondents' demographic characteristics, knowledge, attitudes, and exposure to information with preventive behaviours against Hepatitis A in Kemayoran District, Jakarta. These findings indicate that preventive behaviours are not solely determined by individual awareness, but are also influenced by broader social, educational, and demographic factors, highlighting the multifactorial nature of disease prevention in the community.

Based on the data presented in the analysis, preventive behaviours against Hepatitis A were more frequently practiced among respondents with specific characteristics. In terms of age, respondents aged 31–45 years demonstrated a higher likelihood of adopting preventive measures (44.3%) compared to those aged 15–30 years, suggesting that adults in the older age group may have greater health awareness, more experience with hygiene practices, and a heightened sense of responsibility for personal and family health. Gender differences were also evident, with females (71.1%) more actively engaging in preventive behaviours than males, potentially reflecting the traditional role of women in managing household health and nutrition.

Employment status similarly influenced preventive practices. Employed respondents (70.0%) were more likely to implement preventive behaviours than unemployed respondents. This may be associated with greater access to health information in workplace environments, better financial resources to purchase hygienic food and clean water, and

routine exposure to structured health programs. Educational attainment further demonstrated a strong association, as respondents with education beyond senior high school (73.9%) were more consistent in practicing preventive measures compared to those with only junior or senior high school education. Higher education levels likely facilitate better understanding of disease transmission, health literacy, and the importance of consistent preventive actions.

In addition to demographic factors, knowledge played a critical role. Respondents with good knowledge of Hepatitis A (71.7%) were more likely to engage in preventive behaviours compared to those with poor knowledge, underscoring the importance of awareness and understanding of transmission pathways in influencing practical health behaviours. Similarly, attitudes toward hygiene and disease prevention were significant predictors; respondents with positive attitudes (71.7%) demonstrated a higher frequency of preventive actions than those with less favourable attitudes. This finding aligns with health behaviour theories, such as Green's model, which suggest that attitudes, when combined with enabling and reinforcing factors, strongly influence behaviour outcomes.

Information exposure also emerged as a key determinant. Respondents who had been exposed to health information about Hepatitis A (70.9%) were more likely to adopt preventive measures, highlighting the pivotal role of health education, counselling, and community outreach programs in shaping preventive behaviours. This emphasizes that access to reliable health information can directly influence individual decision-making and promote adoption of protective practices. Overall, the study indicates that preventive behaviours against Hepatitis A were most commonly practiced by respondents who were adults (31–45 years), female, employed, highly educated, knowledgeable, possessed positive attitudes, and had been exposed to health information. These findings suggest that effective public health interventions must consider demographic, educational, and psychosocial determinants to maximize adoption of preventive behaviours.

These results are consistent with previous studies. Parmono et al. (2010) reported that individuals under 35 years of age had a 4.6-fold higher risk of contracting Hepatitis A, and males or those with lower education levels were more vulnerable. Similarly, Ariyarathana and Abeysena (2020) emphasized that limited income and lack of access to information significantly increase risk, highlighting the crucial role of education and targeted health promotion. Ernawati et al. (2010) also demonstrated that environmental and individual risk factors jointly influence disease occurrence, which parallels our findings on Hepatitis A, underscoring the need for integrated strategies that combine education, behaviours interventions, and environmental improvements to reduce disease risk effectively.

The results showed significant associations between preventive behaviors and factors such as age, education, gender, and information exposure ($p < 0.05$). These findings are consistent with previous studies in Malaysia and Thailand (Raihan, 2020; Rianthavorn et al., 2023), which reported that higher educational attainment and health literacy improve hygiene practices and vaccination awareness. From a nursing perspective, these results underline the need for targeted health education, especially for low-education groups. Community nurses can play a key role by promoting family-based interventions and culturally tailored health messages through local health posts (Ryder & Beckingham, 2024). Integrating behavioral insights into nursing practice aligns with World Health Organization framework on community engagement for infectious disease preventive. Hence, strengthening public awareness and promoting safe sanitation behaviors should become a part of nursing-led health promotion programs in urban communities (Ariyarathna & Abeysena, 2020; Ernawati et al., 2010; Parmono et al., 2024; Shouval, 2024).

4. Conclusions

Hepatitis A is a highly contagious acute infectious disease of the liver caused by the Hepatitis A virus (HAV), a non-enveloped RNA virus primarily transmitted through the fecal-oral route. As a communicable disease, Hepatitis A presents a significant public health concern worldwide, particularly in regions with limited sanitation infrastructure,

inadequate hygiene practices, and insufficient public health education. Unlike chronic forms of hepatitis, Hepatitis A is generally self-limiting and resolves within a few weeks; however, it can result in severe clinical manifestations, including fulminant hepatitis, in vulnerable populations. Its widespread prevalence and potential to cause outbreaks in both urban and rural settings underscore the necessity of understanding not only the biomedical aspects of the disease but also the socio-environmental and behaviours factors that influence its transmission.

The transmission dynamics of Hepatitis A are closely linked to hygiene and sanitation practices within communities. Poor hand hygiene, unsafe food handling, the consumption of contaminated water, and communal eating practices have all been shown to increase the risk of infection. In this context, demographic variables such as age, gender, occupation, and educational attainment, as well as psychosocial determinants including knowledge, attitudes, and exposure to health-related information, play a pivotal role in shaping preventive behaviours. These determinants do not operate in isolation; rather, they interact in complex ways, contributing to the likelihood of disease transmission and influencing the effectiveness of public health interventions.

The distribution of preventive behaviours among residents of Kemayoran District highlights several noteworthy patterns. Respondents frequently reported engaging in key personal hygiene practices, such as washing hands with running water, using soap regularly, and performing handwashing before and after meals and after defecation. These practices align with global recommendations for preventing fecal-oral transmission of infectious diseases, demonstrating a level of behaviours awareness among community members. Preventive behaviours extended beyond personal hygiene to include environmental and dietary practices, such as using uncontaminated water for consumption, washing food thoroughly before eating, cooking with clean utensils, purchasing food prepared under hygienic conditions, and avoiding communal eating practices. Collectively, these behaviours suggest that residents possess a practical understanding of how to minimize the risk of Hepatitis A transmission in everyday life.

Nevertheless, the study also identified gaps in certain preventive behaviours. For instance, thorough cooking of food, a critical step in eliminating potential viral contamination, was inconsistently practiced. This indicates that while residents may recognize the importance of hygiene in principle, translating knowledge into consistent and complete action remains a challenge. Such gaps in preventive practices underscore the need for targeted interventions that reinforce the connection between awareness and actionable behaviour, particularly in areas where traditional habits, convenience, or misconceptions may inhibit full compliance with recommended practices.

Demographic factors emerged as significant influences on preventive behaviours in this population. The majority of respondents were adults aged 31–45 years, predominantly female, employed, and with educational attainment ranging from junior to senior high school. Women in the adult working population may be more likely to adopt preventive behaviours due to their traditional roles in household management, caregiving, and food preparation, which heighten their awareness of hygiene and sanitation requirements. Employment status can also play a dual role, as it may increase access to health information and resources while simultaneously imposing time constraints that affect the consistency of preventive actions. Educational background is another critical determinant, with higher levels of education generally associated with better comprehension of health information, increased awareness of disease transmission pathways, and a greater likelihood of implementing protective behaviours.

Knowledge regarding Hepatitis A presented a nuanced picture. While respondents demonstrated familiarity with the basic definition of the disease, considerable gaps existed in understanding more technical aspects, such as the virus's aetiology, detailed modes of transmission, and epidemiological characteristics. This indicates that although general awareness campaigns may successfully convey the existence and broad risks of Hepatitis A, they may fall short in providing comprehensive, actionable knowledge that enables consistent preventive behaviour. Misunderstandings or incomplete health literacy can

undermine the effectiveness of health promotion efforts, emphasizing the importance of designing educational programs that are not only informative but also culturally and contextually relevant.

Attitudinal factors also influenced preventive behaviours. Most respondents were categorized as moderate in their attitudes toward personal hygiene, household cleanliness, and environmental sanitation. This suggests a baseline awareness and willingness to engage in healthy practices; however, the intensity, regularity, and thoroughness of these behaviours were not optimal. Moderate attitudes, when combined with partial knowledge gaps, can result in incomplete adherence to preventive recommendations, highlighting the critical role of both knowledge reinforcement and attitude shaping in public health interventions.

Exposure to health information emerged as another essential determinant. The majority of respondents reported having received previous counselling or educational sessions regarding Hepatitis A, actively seeking information on the disease, participating in health education initiatives related to Clean and Healthy Living Behaviour (PHBS), and engaging in discussions with healthcare professionals. Such exposure reinforces the idea that health communication, when effectively delivered and actively sought, can positively influence preventive behaviours. Structured, repeated, and context-specific health education can bridge knowledge gaps, strengthen attitudes, and encourage sustained behaviour change, demonstrating the value of proactive community-based interventions.

Taken together, these findings highlight a clear knowledge–behaviour gap: while awareness of Hepatitis A as a disease is relatively high, understanding of its transmission pathways and consistent adoption of preventive behaviours remain incomplete. This mirrors previous findings who observed that knowledge of disease risk does not always translate into consistent protective practices in the context of respiratory infections. Such discrepancies underscore the multifactorial nature of preventive behaviour, which is influenced by demographic characteristics, psychosocial determinants, environmental context, and access to reliable health information.

The implications of these findings for public health practice are substantial. Preventive programs for Hepatitis A cannot rely solely on biomedical interventions, such as vaccination campaigns, which, while crucial, address only part of the risk profile. Effective prevention must also integrate community education, targeted health promotion, and systematic improvements in environmental sanitation. Enhancing health literacy, fostering positive attitudes toward hygiene, and ensuring broad access to reliable information are essential for achieving sustained behavioural change. Programs should be designed to be culturally sensitive and contextually appropriate, taking into account the unique characteristics, habits, and constraints of urban populations like those in Kemayoran District.

Furthermore, the study underscores the importance of a comprehensive, multi-level approach that combines individual, household, and community-level interventions. At the individual level, promoting knowledge and awareness through educational campaigns and counselling can empower residents to take proactive measures. At the household level, initiatives targeting food safety, water purification, and proper sanitation can reduce environmental risk factors. At the community level, broader interventions such as public hygiene infrastructure, regulation of street food vendors, and neighbourhood health promotion campaigns can create an enabling environment for preventive behaviours to be consistently practiced.

In conclusion, the prevention of Hepatitis A in Kemayoran District is influenced by a complex interplay of biological, environmental, demographic, and psychosocial factors. The significant associations observed between preventive behaviours and variables such as age, sex, occupation, education, knowledge, attitudes, and information exposure emphasize the multifactorial determinants of disease prevention. Addressing these determinants requires an integrated approach that combines biomedical interventions, community-based education, and environmental improvements. The findings provide valuable evidence for policymakers, healthcare providers, and public health practitioners to design and implement culturally relevant, community cantered strategies aimed at reducing the

incidence of Hepatitis A, promoting sustained behavioural change, and ultimately improving population health outcomes in urban communities.

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Author Contribution

All authors contributed substantially and collaboratively to the conception, methodology development, data collection and analysis, interpretation of findings, manuscript preparation, revision, and final approval of the manuscript. Each author participated proportionally in every stage of the research process and takes full responsibility for the accuracy, integrity, and scholarly quality of the work.

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Ethical Review Board Statement

The study was conducted per the applicable ethical guidelines and approved by the Ethics Committee of Universitas YARSI (Protocol Code: No:117/KEP-UY/EA.20/III/2025, Date of Approval: 26 March 2025).

Informed Consent Statement

All participants involved in this research were thoroughly informed about the purpose, objectives, and procedures of the study prior to their participation. The researchers provided clear explanations regarding what participation would entail, the types of data to be collected, and how the information would be used, analysed, and reported. Written informed consent was obtained from each participant before their inclusion in the study, ensuring that they fully understood their rights, responsibilities, and the voluntary nature of participation. Participants were explicitly informed that they had the freedom to decline participation or withdraw from the study at any stage without any negative consequences. Additionally, measures were taken to guarantee the confidentiality and privacy of all data collected, with personal identifiers removed and information handled securely. This process ensured that ethical standards were maintained in accordance with research guidelines and reinforced the respect for participant autonomy and well-being throughout the study.

Data Availability Statement

The data supporting the findings of this study are available within the article. Additional raw data are not publicly available due to privacy and confidentiality concerns, but may be obtained from the corresponding author upon reasonable request.

Conflicts of Interest

The authors declare no conflict of interest.

Declaration of Generative AI Use

During the preparation of this work, the author(s) used Grammarly to assist in improving grammar, clarity, and academic tone of the manuscript. After using this tool, the

author(s) reviewed and edited the content as needed and took full responsibility for the content of the publication.

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Biographies of Authors

Fadillah Rodhatul Jannah, Faculty of Medicine, Universitas YARSI, Jakarta, Special Capital Region of Jakarta 10510, Indonesia
- Email: dewiastt2121@gmail.com
- ORCID: N/A
- Web of Science ResearcherID: N/A
- Scopus Author ID:
- Homepage: N/A

Kholis Ernawati, Department of Public Health, Faculty of Medicine, Universitas YARSI, Jakarta, Special Capital Region of Jakarta 10510, Indonesia.
- Email: kholisernawati2@gmail.com
- ORCID: 0009-0003-8568-9280
- Web of Science ResearcherID: N/A
- Scopus Author ID: 57210110753
- Homepage: https://scholar.google.com/citations?user=kvM1yXcAAAAJ&hl=id

Roni Hidayat, Department of Religion, Faculty of Master Management, Universitas YARSI, Jakarta, Special Capital Region of Jakarta 10510, Indonesia.
- Email: roni.hidayat@yarsi.ac.id
- ORCID: 0009-0001-4269-1802
- Web of Science ResearcherID: N/A
- Scopus Author ID: N/A
- Homepage: https://scholar.google.com/citations?user=pF9S5tMAAAAJ&hl=en

Rifda Wulansari, Faculty of Medicine, Universitas YARSI, Jakarta, Special Capital Region of Jakarta 10510, Indonesia.
- Email: rifda.wulansari@yarsi.ac.id
- ORCID: N/A
- Web of Science ResearcherID: N/A
- Scopus Author ID: 59997369500
- Homepage: https://scholar.google.com/citations?user=9SGeqPQAAAAJ&hl=en