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Analysis of Healthy Lifestyles According to Digital Health Literacy in Adolescent Girls Aged 11-19 Years

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Abstract

Adolescent health problems are generally related to risky behavior and lifestyle. Adolescents' healthy lifestyles are influenced by various factors, one of which is health literacy. Teenagers tend to use new media as a source of information, so a different health literacy approach is needed namely digital health literacy. The research aims to determine the relationship between digital health literacy and a healthy lifestyle in adolescent girls aged 11-19 years. A research method is a descriptive analysis that uses secondary data. The population was 689 adolescent girl women aged 11-19 years. with a sample of 530 people selected purposively. The secondary data used was collected through interviews and anthropometric measurements. The data analysis is univariate and bivariate. The results showed that adolescent girls had good eating habits were 59.7%, 53.2% had good physical activity but 69.4% had smoked. Digital health literacy was 54.5% in the high category, and the literacy components of accessing information, evaluating, and applying information were mostly in the high category. The conclusion is there's no relationship ($p > 0.05$) between digital health literacy and eating behaviour, physical activity, and smoking behavior. However, there is a relationship ($p<0.05$) between the information access component and smoking behavior. It is necessary to study qualitatively related to this study.

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Introduction

Indonesia's population in 2021 is 272,682.5 people and is projected to reach 275,773.8 people in 2022 (Van Kessel et al.. 2022). It is estimated that one-third of Indonesia's population in 2021 will be young people aged 10-24 years (Kemenkes RI. 2022). Most young people around the world are healthy, but more than 1.5 million adolescents and young adults aged 10–24 years died in 2020 or nearly 5,000 deaths every day (UNICEF. 2021). As many as 17.98% of the Indonesian population aged 15-19 years had health complaints in the last month, increasing at the age of 20-24 years by 21.30% and continuing to increase according to age (BPS. 2021). National Basic Health Research in Indonesia 2018 showed the prevalence of obesity in the age group of 16-18 years was 4.0%, then the prevalence increased in the age group over 18 years by 21.8% (Kemenkes RI. 2019). This fact shows that young people prone to various health problems. If this is left unchecked, it will have an impact on productivity when entering adulthood. Adult age will be spent more to treat the disease suffered.

H.L. Blum's theory states that four factors affect health sequentially, namely lifestyle, environment, health services, and genetic factors (Notoatmodjo. 2018). Health problems at a young age are generally related to risky behaviors and lifestyles. such as smoking behavior. free sex. low physical activity. unhealthy eating patterns. and other behaviors. National Basic Health Research data in Indonesia in 2018 shows that the proportion of eating sweets at a young age is quite high. starting from the 15-19-year-old group of 50.6% and then increasing in the 20-24-year-old group of 51.7%. The proportion of the habit of drinking sweet drinks is also quite high and reaches the same number in the age group 15-19 years and 20-24 years. namely 56.43%. Meanwhile. the proportion of physical activity in Indonesia's population increased from 26% in 2013 to 33% in 2018 (Kemenkes RI. 2019). This shows that young lifestyles tend to be risky or unhealthy.

The development of a healthy lifestyle at a young age is influenced by various factors, one of which is health literacy (Haryuningtyas. 2015). Health literacy is considered the main factor influencing a person's health status besides income, employment status, education, or race (WHO. 2013). A low level of health literacy will affect low physical activity and unhealthy eating patterns (Zanobini et al.. 2021). A person's healthy lifestyle can improve if a person's ability to obtain and process health information can be carried out optimally (Haryuningtyas. 2015). This ability must be owned by today's young people to improve their health status.

The younger generation is more likely to use new media (internet. mobile devices) than old media (analog television, radio) as a source of information. This new media not only provides convenience in accessing quality health information but also provides easy access to information that is inaccurate, sometimes deliberately misleading, and often driven by commercial motives (Swire-Thompson & Lazer. 2019). Therefore, it is necessary to develop different literacy skills in assessing relevance, and the accuracy of various sources of health information from this new media which Nutbeam calls digital health literacy (Nutbeam. 2021). Based on this description. the researcher is interested in researching the lifestyle analysis of adolescents aged 11-19 years according to their level of digital health literacy. The research aims to determine the relationship between digital health literacy and a healthy lifestyle in adolescent girls aged 11-19 years.

Methods

The research design is descriptive analysis with a cross-sectional approach using secondary data. The data was taken from the results of student field studies at the Dharma Husada Institute of Health Sciences. Data collection through direct interviews with respondents was carried out by students in January 2023. Data processing was carried out from April to May 2023. The population consisted of 689 adolescent girls aged 11-19 years in Girimekar Village, with a sample of 530 adolescent girls from 11 Citizens Association who were purposively selected based on geographical considerations. The independent variable is digital health literacy, the dependent variable is the healthy lifestyle of adolescent girls including smoking behavior, eating behavior, and physical activity.

The secondary data was collected using two types of research instruments. The first instrument, adapted from the 2018 Indonesian Basic Health Research aims to measure a healthy lifestyle including smoking behavior, eating behavior, and physical activity. The second instrument measures the level of digital health literacy in adolescents, adapted by Norman & Skinner which is translated into Indonesian consists of 8 questions about the respondent's ability to search, find, understand, and assess health information from electronic sources and apply the knowledge gained to overcome or solve health problems. The digital health literacy instrument has alternative answers: strongly disagree (score 1), disagree (score 2), agree (score 3) and strongly agree (score 4). The digital health literacy instrument has been tested previously with a sufficient reliability value (Cronbach Alpha = 0.789) and has a positive relationship with health literacy (HLS-EU-Q16) as an indicator of criterion validity with result r=0.183 and p=0.037 (Sjamsuddin & Anshari. 2023).

The univariate analysis through the frequency distribution of all variables, and the bivariate analysis with the Chi-square test to identify the relationship between digital health literacy and healthy lifestyle behaviors (eating behavior, physical activity, smoking). The analysis uses a 2x2 cross table to calculate the Odds Ratio (OR) value.

Results

Characteristics of Respondent

The largest proportion of respondent's education is in Junior High School (39.1%), followed by High School (37.2%), and Elementary School (23.8%). The average age of the respondents was 14.56 years with the lowest age being 11 years and the highest being 19 years.

Frequency Distribution of Healthy Lifestyle and Digital Health Literacy

Next is the frequency distribution table for all research variables.

Table 1. Frequency Distribution of Healthy Lifestyle and Digital Health Literacy (n=530)

Variable	Category	Amount	%
Healthy Lifestyle:			
Healthy Life (overall)	Not Good	254	47.4
	Good	279	52.6
Eating Behaviour	Not Good	217	40.9
	Good	313	59.1
Physical Activity	Low	248	46.8
	High	282	53.2
Smoke	Smoking (rarely - a week 1-2 days)	368	69.4
	Do not smoke	162	30.6
Digital health literacy:			
Digital health literacy (overall)	Low	241	45.5
	High	289	54.5
Digital health literacy (access: search – find)-P1, P2, P3	Low	60	11.3
	High	470	88.7
Digital health literacy (evaluation)-P4.P5	Low	92	17.4
	High	438	82.6
Digital health literacy (apply)-P6, P7, P8	Low	113	21.3
	High	417	78.7

More than half of adolescent girls have a healthy lifestyle in the good category. as well as eating behavior and physical activity mostly in the good category. However, 7 out of 10 have smoked, although rarely. More than half of adolescent girls have digital health literacy in the high category, as well as digital health components in accessing, evaluating. and applying information, mostly in the high category. The following table describes the average answers to each question.

Table 2. Average Score For Each Health Digital Literacy Question

Digital Health Literacy Questions	Average
P1. I know how to find useful health information on the internet.	2.97
P2. I know how to use the internet to answer my health questions.	3.11
P3. I know what health information is available on the internet.	3.06
P4. I know where to find useful health information on the internet.	3.11
P5. I know how to use health information found on the internet to help me.	3.07
P6. I have the skills to assess health information from the internet.	2.97
P7. I can tell the difference between high and low-quality health information on the internet.	3.00
P8. I feel confident using health information from the internet to make decisions about choose a course of action regarding a health condition.	2.92
All questions (P1 to P8)	3.00

The average score for digital health literacy questions ranged between 2.9 and 3.12 with the average overall question score being 3 (median). The median value was used because the data was not normally distributed (Kolmogorov Smirnov test p 0.000). The highest score on the second and fourth questions was 3.11, where the two questions were related to the use and benefits of health information. Meanwhile, the lowest score found in the eighth question was 2.92, where the question was related to decision making based on health information.

The Relationship Between Digital Health Literacy With Health Life Style

Table 3. The Relationship Between Digital Health Literacy With Healthy Lifestyle

Digital Health Literacy	Digital Health Literacy Category	Healthy Life Style						p-value / OR	95% CI (lower-upper)
		Not Good		Good		Total			
		f	%	f	%	f	%		
Digital health literacy (overall)	Low	119	49.4	122	50.6	241	100	0.446 1.160	0.824 1.634
	High	132	45.7	157	54.3	289	100		
Digital health literacy (access: search – find)	Low	31	51.7	29	48.3	60	100	0.567 1.215	0.709 2.080
	High	220	46.8	250	53.2	470	100		
Digital health literacy (evaluate)	Low	43	46.7	49	53.3	92	100	0.987 0.970	0.618 1.523
	High	208	47.5	230	52.5	438	100		
Digital health literacy (Apply)	Low	52	46.0	61	54.0	113	100	0.829 0.934	0.616 1.417
	High	199	47.7	218	52.3	417	100		

There is no significant relationship between digital health literacy with a healthy lifestyle (overall) of adolescent girls aged 11-19 years. Likewise, there is no significant relationship between the access digital health literacy component, the evaluation digital health literacy component, the apply digital health literacy component and healthy lifestyles (overall) in adolescent girls aged 11-19 years.

Furthermore, the following table shows the results of the relationship between digital health literacy and eating behavior, physical activity and smoking in adolescent girls.

Table 4. The Relationship Between Digital Health Literacy With Eating Behavior

Digital Health Literacy	Digital Health Literacy Category	Eating Behavior						p-value / OR	95% CI (lower/ upper)
		Not Good		Good		Total			
		f	%	f	%	f	%		
Digital health literacy (overall)	Low	93	17.5	148	27.9	241	45.5	0.359 0.836	0.590 1.185
	High	124	23.4	165	31.1	289	54.5		
Digital health literacy (access: search – find)	Low	28	5.3	32	6.0	60	11.3	0.413 1.301	0.758 2.232
	High	189	35.7	281	53.0	470	88.7		
Digital health literacy (evaluate)	Low	41	7.7	51	9.6	92	17.4	0.509 1.197	0.761 1.883
	High	176	33.2	262	49.4	438	82.6		
Digital health literacy (Apply)	Low	52	9.8	61	11.5	113	21.3	0.259 1.302	0.856 1.979
	High	165	31.1	252	47.5	417	78.7		

There is no significant relationship between digital health literacy with eating behavior of adolescent girls aged 11-19 years. Likewise, there is no significant relationship between the access digital health literacy component, the evaluation digital health literacy component, the apply digital health literacy component with eating behavior of adolescent girls aged 11-19 years.

Table 5. The Relationship Between Digital Health Literacy With Physical Activity

Digital Health Literacy	Digital Health Literacy Category	Physical Activity						p-value / OR	95% CI (lower/ upper)
		Low		High		Total			
		f	%	f	%	f	%		
Digital health literacy (overall)	Low	114	21.5	127	24.0	241	45.5	0.898 / 1.038	0.737 – 1.463
	High	134	25.3	155	29.2	289	54.5		
Digital health literacy (access: search – find)	Low	30	5.7	30	5.7	60	11.3	0.696 / 1.156	0.675-1.979
	High	218	41.1	252	47.5	470	88.7		
Digital health literacy (evaluate)	Low	42	7.9	50	9.4	92	17.4	0.900 / 0.946	0.603-1.485
	High	206	38.9	232	43.8	438	82.6		
Digital health literacy (Apply)	Low	43	8.1	70	13.2	113	21.3	0.046 / 0.635	0.415-0.972
	High	205	38.7	212	40.0	417	78.7		

There is no significant relationship between digital health literacy with physical activity of adolescent girls aged 11-19 years. Likewise, there is no significant relationship between the access digital health literacy component, the evaluation digital health literacy component, the apply digital health literacy component with physical activity of adolescent girls aged 11-19 years.

Table 6. The Relationship Between Digital Health Literacy With Smoking Behavior

Digital Health Literacy	Digital Health Literacy Category	Smoking Behavior						p-value / OR	95% CI (lower/ upper)
		Smoke		Do not smoke		Total			
		f	%	f	%	f	%		
Digital health literacy (overall)	Low	178	33.6	63	11.9	241	45.5	0.054/ 1.472	1.011-2.145
	High	190	35.8	99	18.7	289	54.5		
Digital health literacy (access: search – find)	Low	50	9.4	10	1.9	60	11.3	***0.020 / 2.390***	1.180-4.841
	High	318	60.0	152	28.7	470	88.7		
Digital health literacy (evaluate)	Low	66	12.5	26	4.9	92	17.4	0.687 / 1.143	0.696-1.879
	High	302	57.0	136	25.7	438	82.6		
Digital health literacy (Apply)	Low	82	15.5	31	5.8	113	21.3	0.490 / 1.212	0.763-1.923
	High	286	54.0	131	24.7	417	78.7		

There is no relationship between digital health literacy with smoking behavior of adolescent girls aged 11-19 years. There is significant relationship between access digital health literacy component with smoking behavior, but there is no significant relationship between the evaluation digital health literacy component, the apply digital health literacy component with smoking behavior of adolescent girls aged 11-19 years.

Discussion

Healthy Lifestyle of Adolescent Girls Aged 11-19 Years

The study results show that more than half (52.6%) of adolescent girls have a healthy lifestyle, as well as eating behavior (59.7% good) and physical activity (53.2% good). This is in line with previous research that diet is higher among women than men), but physical activity is higher among men (Widyasari & Turnip. 2019). A good healthy lifestyle is very important for preventing cardiovascular disease, namely improving health, reducing risk, and preventing and managing disease if it is already affected. Health behavior, including patterns of food intake, and physical activity, as well as smoking and alcohol consumption is very important for children, adolescents, and adults (Hayman & Worel. 2014).

Other research suggests that individuals with a good healthy lifestyle achieve higher goals in life. This also means that a healthy lifestyle predicts the existence of goals in life. This is important as an efficient approach to health promotion (Hayman & Worel. 2014). Health promotion efforts to encourage healthy lifestyles in various age groups including teenagers are very important in achieving life goals and preventing disease, especially non-communicable diseases such as cardiovascular disease.

Eating Behaviour of Adolescent Girls Aged 11-19 years

The results of this study showed that 3 out of 5 adolescent girl respondents had good eating behavior. Eating behavior is one of the factors that causes anemia in adolescent girls, this was stated in the results of a review of several previous studies (Surtimanah & Sjamsuddin. 2021). Anemia in adolescent girls is a serious matter because adolescent girls are prospective mothers in the next few years of their life cycle,

this requires prevention interventions and case management. Good eating habits need to be habituated since they were teenagers, even from early childhood.

The results of this study showed that adolescent girl respondents who eat regularly 3 times a day were only 12.1%, regularly 2 times a day were 41.1%, regularly more than 3 times a day were 19.6%, and eating irregularly every day was 27.2 %. A good meal frequency in a day consists of 3 main meals, namely breakfast, lunch, and dinner. The meal schedule is divided into breakfast (before 09.00), lunch (12-13), and dinner (18.00-19.00). An irregular eating schedule can have an impact on the stomach. In addition, an irregular eating schedule makes hungrier than people who are hungry to eat regularly, so it will be more difficult to control what will be consumed so that the amount consumed is greater. Eating once a day is not recommended, because it can trigger fatigue due to increased use of muscle energy reserves and decreased/reduced muscle glycogen (Uswah. 2022).

Related to the proportion of types of food consumed in a day, the results of this study indicate the consumption of animal side dishes is uncertain in a day expressed by 47.5% of adolescent girls, 1-2 times a day stated by 41.5% of women, 3 times a day is stated by 8. 5% and more than 3 times a day by 2.5% of the adolescent girl. Furthermore. the consumption of indeterminate vegetable side dishes in a day was stated by 46.6% of adolescent girls, 1-2 times a day was stated by 39.2%, 3 times a day was only stated by 11.7%. and more than 3 times a day by 2.5 % adolescent girl. The uncertain portion of vegetables in a day is stated by 47.9% of adolescent girls, 1 portion a day is stated by 32.6%, 2 servings a day is stated by 14.2%, and 3 servings or more a day is stated by 5.3% of adolescent girls. The uncertain portion of fruit in a day was stated by 62.6% of adolescent girls, 1-2 times a day was stated by 28.1%, 3 times a day was stated by 7.2%, and 3 times a day was stated by 2.1% of adolescent girls.

The results of this study when compared with the standards of balanced nutrition in the form of food proportions on the My Plate Filling Concept (*Konsep Isi Piringku*) indicate a lack of consumption of vegetables and fruit in a day, as well as a lack of consumption of animal and vegetable side dishes. Society is categorized as enough to consume enough vegetables and fruit if they consume at least 5 servings of vegetables and/or fruit (a combination of vegetables and fruit) per day for 7 days a week. It is categorized as bad if the consumption of vegetables and fruit is less than the provisions above and 96.4% of the population aged 15-19 years do not consume enough fruit vegetables (Kemenkes RI. 2019). Likewise, the types of snacks consumed by 55.5% of adolescent girls in this research mentioned cakes/sweetbreads, and only 16.0% mentioned fruits. This condition needs to be used as educational material because of the need to reduce the consumption of carbohydrates that contain sugar, which according to several sources currently tends to increase cases of Diabetes Mellitus Type 2 (Restyana Noor Fatimah. 2015).

Physical Activity of Adolescent Girls Aged 11-19 years

The results of this study showed that 46.8% of adolescent girl respondents expressed low-category physical activity. This is in line with the Basic Health Research in Indonesia 2018 results that nationally the population aged >= 10 years is 33.5%, and in West Java it is 37.5%. Specifically for the 15-19 year age group, 49.6% lack physical activity (Kemenkes RI. 2019).

In detail, the results of this study showed that 28.3% of adolescent girls had never stretched in the last month, 42.8% rarely (once in the last month) did stretching, as many as 9.1% did it 2-3 times in the last month, and as many as 19.8% said they did it every week in the last month. Furthermore, as many as 36.6% of adolescent girls had never done physical exercise in the last month, as many as 44.2% rarely (once in the last month) did physical exercise, as many as 7.7% did 2-3 times in the last month, and as many as 11.5% said they did it every week in the last month. Another physical activity is doing household chores. As many as 10.6% of adolescent girls had never done household chores in the last month, as many as 18.9% rarely (once in the last month) did household chores, as many as 26.2% did it 2-3 times, and as many as 44.3% said they did it every week in the last month. Furthermore, recreational activities showed that 37.0% of adolescent

girls had never carried out recreational activities in the last month, as many as 47.2% rarely (once in the last month) carried out recreational activities, as many as 10.9% did 2-3 times in the last month. and as many as 4.9% said they did it every week in the last month.

The meaning and benefits of recreational activities are sports / physical activities carried out by individuals, groups, or communities to obtain health, physical fitness, and joy fostering social relations, and preserving and increasing regional and national cultural wealth. Recreational sports include physical activity, recreational programs, intramural sports, physical recreation, and sports. There are 4 main components in recreational sports, namely health, leisure, recreation, and sports. Recreational sports also called sports for all are carried out especially for fun and entertainment in spare time, with the motto "advancing sports and cultivating society". Recreational sports can be done by anyone, anywhere, anytime, and in any activity. Recreational sports are not limited by age, gender, and condition of a person. Recreational sports can be carried out indoors or outdoors without being bound by a certain time (Hernawan. 2020; Tri Irianto. n.d.).

Smoke of Adolescent Girls Aged 11-19 years

Furthermore, the results of this study about smoking behavior showed that 30.6% of adolescent girls said they had not smoked in the past month. The others, 69.4% or 7 out of 10 adolescent girls said they smoke, even though it was rare or 1-2 days a week. This result is in line with the results of the Basic Health Research in Indonesia 2018 that smoked for the first time at the age of 15-19 years in West Java as much as 49.2%, and nationally as much as 48.2%. Other results, show that 24.3% of the population smokes every day and 4.6% only smokes occasionally (Kemenkes RI. 2019), these data are of course very worrying.

There are various reasons why adolescent girls start smoking, including seeing their parents smoking, feeling interested, and feeling when their parents smoke they look very calm and relaxed. Before getting to know her friends, she already smoked (Islami & Hary. 2017). Another reason is the influence of people around her who smoke, such as family members and peers (Sih Martini. 2014). Other studies suggest that there are three dimensions of factors that reason adolescent girls smoke, the extrinsic dimension (the influence of peers and family influence), and the intrinsic dimension of self-image. Peer influence is the highest compared to other dimensions (D. Lestari. 2017). Another grouping of reasons for smoking is interpersonal factors (friends have the most influence), cultural factors, and intrapersonal factors (Nindapitra. 2015). Another opinion suggests that smoking has a positive impact on the lives of adolescents (boys and girls), which can reduce stress. create feelings of pleasure, strengthen relationships between friends, and increase courage and manly feelings. The negative effects of smoking are wasting money, causing dependence, reducing concentration, reducing fitness, and disrupting health. Parents are expected to play a role in controlling adolescent smoking by advising adolescents not to smoke and admonishing adolescents who are already smoking (Nindapitra. 2015).

Digital Health Literacy of Adolescent Girls Aged 11-19 years

The following are the results of this study regarding digital health literacy. More than half of adolescent girls (54.5%) have a high category of digital health literacy, this shows they are literate about the internet. Respondents to this study were Generation Z born in the period 1995 - 2010. This generation is also often referred to as the digital generation. In the previous generation, games were carried out through physical forms, whereas in Generation Z, games were played through technological media. The more often they play and interact with technological media, the greater their dependence on technology, this will have negative and positive impacts. It is these negative and positive impacts that will shape the character of the Z generation (Adityara & Rakhman. 2019). One of the positive aspects of interaction with digital technology is the high level of access to information, including health information. However in reality, the information obtained is not necessarily correct, because inaccurate and even misleading information (hoaxes) is increasingly widespread. Previous research has shown that there is a lot of hoax in the health sector. Hoaxes in the health sector are more dangerous than other hoaxes because they can threaten a person's life (Haikal. 2020). Thus access to health information must be accompanied by an accurate assessment of the information obtained and how it is applied.

The results of this study indicate that the majority (88.7%) of adolescent girls have access to literacy (search and find) in the high category, as 82.6% have evaluation literacy in the high category and application literacy of 78.7% in the high category. This result is a challenge for health promotion efforts so adolescent girls get appropriate health information according to their needs. Media accessed via the internet has very diverse features, such as Instagram, WhatsApp, TikTok, FaceBook, etc.

When viewed from the trend of the average digital health literacy score, the average score tends to increase from the first to the fourth question and then decreases starting from the fifth question to the eighth question. This also means that adolescent girl respondents can use the internet, know the benefits of health

information on the internet, use health information, and assess the quality of health information. Weaknesses were found in the ability to search for information on the internet, skills in assessing information, and making decisions based on the health information obtained.

The Relationship Between Digital Health Literacy With Healthy Lifestyle

Based on table 3, table 4. and table 5 showed that there is no relationship between overall digital health literacy and eating behavior, physical activity, and smoking. Otherwise, access to digital health literacy (search–find) is significantly related to smoking behavior with p 0.020 with OR 2.390. It can be interpreted that adolescent girls have high access to digital information, 2.39 times the probability of not smoking. And vice versa, adolescents with low access to digital information are 2.39 times more likely to smoke. The Access digital health literacy (search–find) has no significant relationship with eating behavior, and physical activity. The evaluation of digital health literacy has no significant relationship with eating behavior, physical activity, and smoking behavior. Likewise, applying digital health literacy is not significantly related to eating behavior, and physical activity.

The relationship between the accessed digital health literacy was significantly related to smoking behavior, it can be interpreted that if adolescent girls have high access to information, then these adolescent girls do not smoke. The information that was accessed allegedly included smoking. the dangers, and how to stop smoking. This information about smoking can be conveyed through messages with internet-based media, one of which is social media. Previous research stated that social media influences increasing motivation and intention to stop smoking in adolescents (Nindapitra. 2015). Other previous studies stated that video is one of the media that is quite effective in influencing its targets in behavior change, one of which is smoking behavior (V. Lestari et al.. 2013). Counseling using video media can also be used for other forms of disease prevention, such as the prevention of COVID-19 disease. Previous research revealed that counseling and health education using video can increase the target's positive knowledge and attitude toward preventing COVID-19, dental, and eye (Surtimanah et al.. 2020. 2021). The results of this research provide an overview of a healthy lifestyle, namely eating habits, physical activity, and smoking behavior as well as an overview of digital health literacy in adolescent girls aged 11-19 years. These results can be used as a database to formulate intervention programs for this target group.

Research Limitation

The limitation of this research is the population does not include young men, even though they also access the internet and need health information. Besides that, that it cannot explore further why digital health literacy is not related to eating habits and physical activity. It is necessary to explore whether messages about eating habits and physical activity do not yet exist in the digital media accessed by adolescent girls, or perhaps they already exist but are not of concern to adolescent girls. Qualitative research is needed to explore this so that it can produce more focused suggestions regarding what digital media are frequently accessed, types of messages/materials available, and the type of materials needed, as well as attractive message packaging.

Conclusion

There is no significant relationship between digital health literacy with healthy lifestyle of adolescent girls aged 11-19 years, but there was a significant relationship between the information access of digital health literacy component and smoking behavior.

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Conflicts of Interest:

No conflict of interest.

References

Adityara. S.. & Rakhman. R. T. (2019). Karakteristik Generasi Z dalam Perkembangan Diri Anak Melalui Visual. *Seminar Nasional Seni Dan Desain 2019.* (Characteristics of Generation Z in Children's Personal Development Through Visuals. *National Art and Design Seminar 2019*). Surabaya. Indonesia. September *2019*. 401–406.

Badan Pusat Statistik (Central Bureau of Statistics). (2021). Profil Statistik Kesehatan (Health Statistics Profile). https://www.bps.go.id/publication/2021/12/22/profil-statistik-kesehatan-2021.html

Haikal. H. (2020). Persepsi Masyarakat terhadap Hoax Bidang Kesehatan*. Jurnal Manajemen Informasi Dan Administrasi Kesehatan.* (Public Perception of Hoaxes in the Health Sector. *Journal of Information Management and Health Administration*). *3* (2). 7–11. https://doi.org/10.32585/jmiak.v3i2.836

Haryuningtyas. F. (2015). Hubungan tingkat literasi kesehatan dengan penerapan gaya hidup sehat pada mahasiswa Keperawatan - Skripsi. (The relationship between the level of health literacy and the implementation of a healthy lifestyle in Nursing students -Thesis).

Hayman. L. L.. & Worel. J. N. (2014). Healthy lifestyle behaviors the important for individual and population approaches. *Journal of Cardiovascular Nursing*. *29*(6). 477–478. https://doi.org/10.1097/JCN.0000000000000199

Hernawan. (2020). Buku Olahraga Rekreasi Dan Waktu Luang. (Recreation And Leisure Sports Book). *Rajawali Pers*.

Islami. F.. & Hary. T. P. (2017). Intensitas Perilaku Merokok Remaja Putri Ditinjau Dari Konformitas. *Jurnal Spirits* (The Intensity of Smoking Behavior of Adolescent girls Judging from Conformity. *Spirits Journal*). *5* (1). 25. https://doi.org/10.30738/spirits.v5i1.1055

Kementerian Kesehatan Republik Indonesia (Indonesian Ministry of Health). (2019). Laporan Nasional RISKESDAS 2018. *Badan Penelitian Pengembangan* (2018 RISKESDAS National Report. *Development Research Agency)*. Vol. 10. https://doi.org/10.12688/f1000research.46544.1

Kementerian Kesehatan Republik Indonesia (Indonesian Ministry of Health). (2022). Profil Kesehatan Indonesia 2021 (Indonesia Health Profile 2021). *Pusdatin.Kemenkes.go.id.*

Lestari. D. (2017). Gambaran Faktor Faktor Yang Menyebabkan Remaja Putri Untuk Merokok. *Jurnal Penelitian Dan Pengukuran Psikologi* (Overview of factors that cause adolescent girls to smoke. *Journal of Psychological Research and Measurement).* 1 (1). 46–54. https://doi.org/10.21009/jppp.011.07

Lestari. V.. Umamah. M.. Pramasari. A.. & Dharmawan. Y. (2013). Smoking Effect Video Learning Berbasis Mobile Sebagai Media Penyuluhan Kesehatan Anti Rokok. *Jurnal Ilmiah Mahasiswa Fakultas Kesehatan Masyarakat Universitas Diponegoro* (Smoking Effect Mobile-Based Video Learning as a Media for Anti-Smoking Health Education. *Student Scientific Journal, Faculty of Public Health, Diponegoro University)*. *3* (1). 97063.

Nindapitra. C. (2015). Studi Kasus Remaja Putri Yang berperilaku merokok di Kota Yogyakarta*. Universitas Negeri Yogyakarta* (Case study of adolescent girls who smoke in the city of Yogyakarta. *Yogyakarta State University*). https://core.ac.uk/download/pdf/196255896.pdf

Notoatmodjo. S. (2018). Ilmu Perilaku Kesehatan (Health Behavior Science). *PT Rineka Cipta.*

Nutbeam. D. (2021). From health education to digital health literacy – building on the past to shape the future. *Global Health Promotion*. *28*(4). 51–55. https://doi.org/10.1177/17579759211044079

Restyana Noor Fatimah. (2015). Diabetes Melitus Type 2. *Majority Journal*. *4*(93–101).

Sih Martini. (2014). Makna Merokok pada Remaja Putri PerokokSih Martini. (2014). *Jurnal Psikologi Pendidikan Dan Perkembangan* (The meaning of smoking among adolescent girls who smoke martinis. (2014). *Journal of Educational and Developmental Psychology*). Volume 3.(2). 119. http://journal.unair.ac.id/download-fullpapers-jppp4111b62529full.pdf.

Sjamsuddin. I. N.. & Anshari. D. (2023). Uji Reliabilitas dan Validitas Instrumen Literasi Kesehatan Digital untuk Mahasiswa Program Sarjana. *The Indonesian Journal of Health Promotion - Media Publikasi Promosi Kesehatan Indonesia* (Reliability and Validity Test of Digital Health Literacy Instruments for Undergraduate Students. Indonesian Health Promotion Publication Media.). *6* (1). 68–74. https://doi.org/10.31934/mppki.v2i3

Surtimanah. T.. Hanifah. H.. Alfianita. D.. Nataria. N.. Audia. S. S.. Mulyawan. P.. & Sjamsuddin. I. N. (2021). Penyuluhan Pencegahan Covid-19 Melalui Video Bagi Masyarakat Perdesaan dan Perkotaan. *AS-SYIFA : Jurnal Pengabdian Dan Pemberdayaan Kesehatan Masyarakat* (Counseling on Covid-19 Prevention via Video for Rural and Urban Communities. *AS-SYIFA: Journal of Community Health Service and Empowerment*). *2* (1). 43. https://doi.org/10.24853/assyifa.2.1.43-54

Surtimanah. T.. & Sjamsuddin. I. N. (2021). Risk factors and interventions for anemia among Adolescent Girls. *Annals of Tropical Medicine & Public Health*. *24*(01). https://doi.org/10.36295/asro.2021.24198

Surtimanah. T.. Sjamsuddin. I. N.. Hana. M.. & Mardiatul. G. (2020). Model Intervensi Penyuluhan Kesehatan

Gigi Dan Mata Pada Anak Sekolah Dasar Negeri Arcamanik Bandung. *Jurnal Kajian Dan Pengembangan Kesehatan Masyarakat* (Intervention Model for Dental and Eye Health Education for Arcamanik Bandung State Elementary School Children. *Journal of Public Health Studies and Development). 01* (01). 1–14.

Swire-Thompson. B.. & Lazer. D. (2019). Public health and online misinformation: Challenges and recommendations. *Annual Review of Public Health*. *41*. 433–451. https://doi.org/10.1146/annurev-publhealth-040119-094127

Tri Irianto. (n.d.). Olahraga Rekreasi (Recreational Sports). http://eprints.ulm.ac.id/5725/1/3. OLAHRAGA REKREASI.pdf

UNICEF. (2021). Levels & Trends in Child Mortality : Report 2021. *UNICEF.* file:///C:/Users/User/Downloads/UNICEF-IGME-2021-Child-Mortality-Report.pdf

Uswah. (2022). Ini Bahayanya kalau Makan Sehari Sekali (This is the danger of eating once a day). *UM Surabaya.* https://www.um-surabaya.ac.id/homepage/news_article?slug=ahli-gizi-um-surabaya-ini-bahayanya-kalau-makan-sehari-sekali#:~:text=Frekuensi makan dalam sehari terdiri.malam (18.00-19.00).

Van Kessel. R.. Wong. B. L. H.. Clemens. T.. & Brand. H. (2022). Digital health literacy as a super determinant of health: More than simply the sum of its parts. *Internet Interventions*. *27* (July 2021). 100500. https://doi.org/10.1016/j.invent.2022.100500

WHO. (2013). Health Literacy : The Solid Facts. *WHO Regional Europe* (Vol. 22. Issue 4). https://doi.org/10.1002/rcm.3390

Zanobini. P.. Lorini. C.. Lastrucci. V.. Minardi. V.. Possenti. V.. Masocco. M.. Garofalo. G.. Mereu. G.. & Bonaccorsi. G. (2021). Health literacy. socio-economic determinants. and healthy behaviors: Results from a large representative sample of Tuscany region. Italy. *International Journal of Environmental Research and Public Health*. *18*(23). https://doi.org/10.3390/ijerph182312432