PREVENTIVE MEDICINE RESEARCH

Original Article

Relationship between media literacy and searching skills on report assignments in nursing students in Japan

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Abstract

Objective: This study evaluates the relationship between information access and media literacy attitudes. We also assessed the impact of "Medical Literature Reading" on media literacy among Japanese university students. Methods: A cross-sectional study was conducted from April 2–16 and from August 2–16, 2024. A self-reporting questionnaire, including the school year, was used to determine if participants had taken the "Medical Literature Reading" course and to identify the sources often used for reporting assignments and media literacy. Results: This study included 195 subjects. The differences in media literacy scores between school years were analyzed. The total scores of fourth-year students were significantly higher than those of first-year on the media literacy scale ($p = 0.014$). The differences in media literacy scores among students enrolled in "Medical Literature Reading" were analyzed. The scores on the media literacy scale ($p = 0.006$) were significantly higher in participants than in non-participants. The relationships among the three groups by sources used for report assignments, school years ($\chi^2(6) = 42.101$, $p < 0.0001$), and history of taking "Medical Literature Reading" ($\chi^2(2) = 7.048$, $p = 0.030$) were also analyzed. Conclusions: Media literacy improved with schooling. Certain report assignments and subjects related to information literacy were found to have affected media literacy. Combining continuing experience and knowledge can lead to improvements in media literacy.

Keywords: Media literacy, Media literacy education, Nursing department, University students

Introduction

The Internet has grown exponentially since its inception[1]. We can access many resources quickly and obtain the information we need; however, some information can be unreliable. Whether we are informationally disadvantaged or advantaged can lead to significant differences in our lives[2]. The Ministry of Internal Affairs and Communications (MIC) conducted a recognition survey[3] to determine how often Japanese people identified incorrect information in media in one month. People in Japan started noticing incorrect information more often in 2022 compared to 2021, especially regarding information available on the Internet. To ensure informational advantages, we must encourage better media literacy.

A substantial amount of information, some correct and some incorrect, was available during the height of the COVID-19 pandemic. People can quickly become panicked when inundated with a large amount of information during emergencies. The word "infodemic" was created by combining "information" and "epidemic" during the COVID-19 pandemic[4], defined by the World Health Organization as too much information, including false or misleading information, in digital and physical environments during a disease outbreak. This causes confusion and risk-taking behaviors that can harm health and also leads to mistrust in health authorities, undermining the public health response[5].

It is therefore considered to be important for regular Japanese citizens to be able find correct information from a vast amount of information in emergencies, such as during health emergencies like the COVID-19 pandemic[6–8].

The damage caused by the 2024 Noto earthquake in Japan was extensive. Social media was helpful in determining people's status, requesting emergency help, and so on. However, this avenue can also spread false information. Indeed, within the first 24 h after the earthquake, there were 254 conflicting reports and 104 false reports out of 1091, according to MIC[9]. This equated to more false reports concerning the 2024 Noto earthquake than the 2016 Kumamoto earthquake, and this situation is not unique to Japan[10,11].

Based on the above information, it is therefore considered to be highly likely that this situation will likely become worse in the future. The digital age has made it easy for anyone to create media, so media consumers are not always aware of who created something, why they made it, or its credibility.

Japanese University students are often given report assignments, wherein they correctly and formally cite information they include. Kubota mentioned that 56.9% of Japanese students use Internet resources as references in these assignments[12]. YouTube is one such Internet resource that includes ample educational content. However, as McMahon mentioned, including educational content does not necessarily mean a source is reliable[13].

We must cultivate high media literacy to thrive in the digital age, as it is also related to maintaining and improving one's health as well as that of others around us[14]. To this end, learning about how to identify correct information during one's college years in an excellent opportunity. Proper citation of appropriate resources is needed for many assignments, and Yonezawa mentioned that taking courses related to information literacy can help improve one's media literacy[15]. At our university, we offer a course called *Iryo Reading* (Medical Literature Reading), which is related to fostering information literacy. We wondered if this course helped promote media literacy among students.

The present study evaluated the relationship between the attitudes toward accessing information and media literacy. We also explored whether or not a "Medical Literature Reading" course helped promote media literacy among students. We further discuss strategies for promoting media literacy among Japanese university students.

Materials and Methods

Subjects

This study recruited first-, second-, and fourth-year university students at the Department of Nursing from April 2–l6, 2024, and third-year students from August 2–16, 2024. We divided the study period based on the availability of the "Medical Literature Reading" course, which was provided in the second semester to third-year university students. Two hundred and twenty-five data points were collected, but 30 were excluded from the study because some data were missing. The study thus ultimately included 195 participants.

Informed consent was obtained from all subjects in accordance with the Declaration of Helsinki. This study was approved by the Okayama University Graduate School of Health Sciences Ethics Committee (#OUHS2024-0041F).

We divided the subjects into three groups by the sources they often use for the report assignments: "low-reliability sources," "high-reliability sources," and "both low- & high-reliability sources." Participants in the "low-reliability sources" group accessed Wikipedia, Yahoo Chiebukuro (Yahoo Answers), and Matomesaito (a summary on a website). Participants in the "high-reliability sources" group accessed direct sources, including Japanese government sites and research paper search engines. Participants in the "both low- & high-reliability sources" group accessed sources from news websites. We could not decide on the search engines to include in this study, so we interviewed several university students about what kinds of search engines they were using for their report assignments.

Study Design

This cross-sectional study used a self-reporting questionnaire that included the school year, sex, whether or not the "Medical Literature Reading" course had been taken (for third- and fourth-year students), the sources they often used for report assignments, and media literacy. The "Medical Literature Reading" course is not limited to medical literature,

instead also providing knowledge on how to search for and utilize various types of literature. In this course, students actively conduct literature searches, gaining an understanding of the characteristics of different literature search platforms and the nature of information available on the Internet. We hypothesized that students who took this course would improve their media literacy.

Media literacy was measured using the media literacy scale developed by Kotera[16]. This scale is an 18-item measure consisting of 6 key elements of media literacy; a) the media message is constructed; b) the media constructs social realities; c) the media message has commercial implications; d) the media message has an embedded ideology; e) each medium has a unique mode; and f) people experience the same message differently. Cronbach's alpha value was 0.44 to 0.63, which is an insufficient value; however, this scale has various aspects for evaluating media literacy correctly and can be used for general purposes. Kotera developed this scale to evaluate critical viewing skills, which is important when students are choosing website sources for their report assignments. We also examined other scales with multiple aspects to correctly assess media literacy, which are also available for Japanese university students. However, there are no other scales[17,18] that can be used to evaluate the media literacy of Japanese university students. This scale has 7 types of evaluations, including a total score of 18 questions, and each consists of 6 key elements. Each item has four response choices of "Strongly disagree" scored as 1, "Disagree" scored as 2, "Agree" scored as 3, and "Strongly agree" scored as 4 (including reverse items).

Statistical Analyses

A one-way analysis of variance (ANOVA) was used to determine the differences in scores on the media literacy scale between school years. We then used multiple comparisons (Tukey's honest significant difference test) to confirm the differences. An unpaired *t* test (two-sided test) was used to determine the differences in scores by the media literacy scale scores between students depending on whether or not they had taken the "Medical Literature Reading" course.

Pearson's chi-squared test was used to confirm the relationship among the three groups based on the sources often used for report assignments, their school years, and whether or not they had taken the "Medical Literature Reading" course. *P* values of <0.05 were considered to indicate statistical significance.

Analyses were performed using the EZR (Easy R) software program version 1.61 for Windows (https://www.jichi.ac.jp/saitama-sct/SaitamaHP.files/statmedEN.html)[19].

Results

Subject's characteristics

The subjects' characteristics are listed in **Table 1**, and their media literacy scale scores are listed in **Table 2**.

All subjects belonged to the Department of Nursing, as we sought to examine the impact of a course related to information literacy on the promotion of media literacy. The participants included 65 first-year students (33.3%), 37 second-year students (19.0%), 53 third-year students (27.2%), and 40 fourth-year students (20.5%). A total of 8 third-year and 18 fourth-year students took the "Medical Literature Reading" course. Most participants were female. Scores on the media literacy scale are presented in **Table 2**. The scores were high in proportion to school years and among participants in the "Medical Literature Reading" course.

Differences in media literacy scale scores by school years

The differences in media literacy scale scores by school years analyzed by a one-way ANOVA are shown in **Table 3**. The total scores of fourth-year students were significantly higher than those of first-year students on the media literacy scale ($p = 0.014$). The scores of fourth-year students were significantly higher than those of first-year students for the media literacy scale section "b) the media constructs social realities ($p = 0.027$)." The scores of fourth-year students were significantly higher than those of first-year students ($p = 0.047$) and second-year students ($p = 0.045$) for the media literacy scale section "e) each medium has a unique mode."

Table 1. Subject's characteristics (n = 195, n (%))

School year	First-year	65 (33.3)
	Second-year	37 (19.0)
	Third-year	53 (27.2)
	Fourth-year	40 (20.5)
"Medical Literature Reading*1" course participation	Taken*2	26 (13.3)
	Not taken*3	169 (86.7)
Use of ChatGPT	Used	74 (37.9)
	Not used	121 (62.1)

*1; The subject "Medical Literature Reading" course is related to information literacy and is provided in third year at the university
where we conducted this study.
*2; Only third- and fourth-year students took the "Medical Literature Reading" course.
*3; Only first- and second-year students did not take the "Medical Literature Reading" course.

Differences in media literacy scale scores among students by participation in the "Medical Literature Reading" course

The differences in media literacy scale scores between students by participation in the "Medical Literature Reading" course analyzed by an unpaired t test (two-sided test) are shown in **Table 4**. The total media literacy scale scores of students who took the "Medical Literature Reading" course were significantly higher than those of students who did not take the course (p = 0.006). Some scores regarding the media literacy scale section were also higher among students who previously took a course on "Medical Literature Reading" at "a) the media message is constructed (p = 0.007)," "b) the media constructs social realities (p = 0.030)," and "e) each medium has a unique mode (p = 0.031)."

Relationship among the three groups of sources often used for report assignments, school years, and participation in the "Medical Literature Reading" course

The relationship between the three groups of "low-reliability sources," "high-reliability sources," and "both low- & high-reliability sources," and school years as analyzed by Pearson's chi-squared test are shown in **Table 5** ($\chi^2(6)$ = 42.101, $p < 0.0001$). First-year students preferred using "low-reliability sources" whereas third-year students used "both low- & high-reliability sources" and "high-reliability sources" significantly more often than "low-reliability sources." None of the fourth-year students used "low-reliability sources." There were no significant sources used among second-year students.

The relationship between the "low-reliability sources," "high-reliability sources," and "both low- & high-reliability sources" groups and participation in the "Medical Literature Reading" course analyzed by Pearson's chi-squared test are shown in **Table 6** ($\chi^2(2) = 7.048$, $p = 0.030$)". Subjects who did not take the "Medical Literature Reading" course were more likely to access low-reliability sources than those who did take it. Of note, none of the subjects who took the "Medical Literature Reading" course used low-reliability sources.

Differences in media literacy scale scores among students by use of ChatGPT for report assignments

The differences in media literacy scale scores among students by use of ChatGPT for report assignments as analyzed using an unpaired t-test (two-sided test) are shown in **Table 7**. There were no significant differences between these groups. However, most scores on the media literacy scale were slightly lower for participants who used ChatGPT to draft report papers than among those who did not use ChatGPT to this end.

Table 2. Media Literacy Scale scores (means ± SD)

Media Literacy Scale*1	Total scores	First-year	51.51 ± 5.04
		Second-year	52.68 ± 5.71
		Third-year	52.72 ± 6.18
		Fourth-year	54.87 ± 4.97
		Students who **took the course***2	**55.50 ± 5.54**
		Students who **did not take the course***3	**52.31 ± 5.48**
	a) the media message is constructed*1	First-year	7.57 ± 1.69
		Second-year	7.92 ± 1.57
		Third-year	8.11 ± 2.02
		Fourth-year	8.26 ± 1.46
		Students who **took the course***2	**8.77 ± 1.61**
		Students who **did not take the course***3	**7.79 ± 1.72**
	b) the media constructs social realities*1	First-year	7.57 ± 1.30
		Second-year	8.19 ± 1.49
		Third-year	7.76 ± 1.58
		Fourth-year	8.41 ± 1.59
		Students who **took the course***2	**8.50 ± 1.70**
		Students who **did not take the course***3	**7.82 ± 1.45**
	c) the media message has commercial implications*1	First-year	9.85 ± 1.30
		Second-year	9.86 ± 1.51
		Third-year	10.37 ± 1.54
		Fourth-year	10.28 ± 1.23
		Students who **took the course***2	**10.23 ± 1.34**
		Students who **did not take the course***3	**10.06 ± 1.30**
	d) the media message has an embedded ideology*1	First-year	8.42 ± 1.24
		Second-year	8.76 ± 1.44
		Third-year	8.72 ± 1.63
		Fourth-year	8.56 ± 1.14
		Students who **took the course***2	**8.77 ± 1.14**
		Students who **did not take the course***3	**8.57 ± 1.41**
	e) each medium has a unique mode*1	First-year	9.80 ± 1.14
		Second-year	9.70 ± 1.31
		Third-year	9.88 ± 1.45
		Fourth-year	10.49 ± 1.32
		Students who **took the course***2	**10.46 ± 1.42**
		Students who **did not take the course***3	**9.86 ± 1.29**
	f) people experience the same message differently*1	First-year	8.31 ± 1.63
		Second-year	8.24 ± 2.11
		Third-year	7.87 ± 1.82
		Fourth-year	8.87 ± 1.70
		Students who **took the course***2	**8.77 ± 1.70**
		Students who **did not take the course***3	**8.21 ± 1.83**

*1; The media literacy scale is an 18-item measure and consists of 6 key elements of media literacy: a) the media message is constructed; b) the media constructs social realities; c) the media message has commercial implications; d) the media message has an embedded ideology; e) each medium has a unique mode; and f) people experience the same message differently.
*2; Only third- and fourth-year students took the "Medical Literature Reading" course.
*3; Only first- and second- year students did not take the "Medical Literature Reading" course.

Table 3. Differences in media literacy scale scores by school year (means ± SD)

	Media Literacy Scale*						
School year	Total scores	a) the media message is constructed	b) the media constructs social realities	c) the media message has commercial implications	d) the media message has embedded ideology	e) each medium has a unique mode	f) people experience the same message differently
First-year	**51.51 ± 5.04**†	7.57 ± 1.69	**7.57 ± 1.30**‡	9.85 ± 1.30	8.42 ± 1.24	**9.80 ± 1.14**§	8.31 ± 1.63
Second-year	52.68 ± 5.71	7.92 ± 1.57	8.19 ± 1.49	9.86 ± 1.51	8.76 ± 1.42	**9.70 ± 1.31**‖	8.24 ± 2.11
Third-year	52.72 ± 6.18	8.11 ± 2.02	7.76 ± 1.58	10.37 ± 1.54	8.72 ± 1.63	9.88 ± 1.45	7.87 ± 1.82
Fourth-year	**54.87 ± 4.97**†	8.26 ± 1.46	**8.41 ± 1.59**‡	10.28 ± 1.23	8.56 ± 1.14	**10.49 ± 1.32**§,‖	8.87 ± 1.70

*; The media literacy scale is an 18-item measure and consists of 6 key elements of media literacy: as a) the media message is constructed; b) the media constructs social realities; c) the media message has commercial implications; d) the media message has an embedded ideology; e) each medium has a unique mode; and f) people experience the same message differently.
† indicates a significant difference between the first and fourth year ($p = 0.014$).
‡ indicates a significant difference between the first and fourth year ($p = 0.027$).
§ indicates a significant difference between the first and fourth year ($p = 0.047$).
|| indicates a significant difference between the second and fourth year ($p = 0.045$).

Table 4. Differences in media literacy scale scores by participation in the "Medical Literature Reading" course

Media Literacy Scale*1	Students who took the course*2 ($n = 26$)	Students who did not take the course*3 ($n = 169$)	p value
Total scores	55.0 ± 5.54	52.3 ± 5.48	**0.006**
a) the media message is constructed	8.8 ± 1.61	7.8 ± 1.72	**0.007**
b) the media constructs social realities	8.5 ± 1.70	7.8 ± 1.45	**0.030**
c) the media message has commercial implications	10.2 ± 1.34	10.1 ± 1.30	0.534
d) the media message has an embedded ideology	8.8 ± 1.14	8.6 ± 1.41	0.489
e) each medium has a unique mode	10.5 ± 1.42	9.9 ± 1.29	**0.031**
f) people experience the same message differently	8.8 ± 1.70	8.2 ± 1.83	0.146

*1; The media literacy scale is an 18-item measure and consists of 6 key elements of media literacy: a) the media message is constructed; b) the media constructs social realities; c) the media message has commercial implications; d) the media message has an embedded ideology; e) each medium has a unique mode; and f) people experience the same message differently.
*2; Only third- and fourth-year students took the "Medical Literature Reading" course.
*3; Only first- and second- year students did not take the "Medical Literature Reading" course.

Discussion

Relationship between sources used for report assignments and media literacy

In this study, the average total score on the media literacy scale was 52.94, which was almost the same as the score of 52.92 in the study conducted by Kotera[16] on university students. The total score increased with school year, as first- and second-year students have fewer opportunities to complete report assignments than do third- or fourth-year students.

Students must learn which sources are suitable and reliable for report assignments through experience. Of note, "Information I," in which students learn about different types of resources and how to use them, has only been a required subject in high schools in Japan since 2022. This means that only first- and second-year students took the subject during high school. However, despite this experience, the media literacy scale scores in these subjects were lower than in older students. This suggests that knowledge alone is insufficient for correct application.

Table 5. Rlationship among the three groups of sources often used for report assignments and school years (observed frequency (expected frequency), %)

Source reliability*1	First-year	Second-year	Third-year	Fourth-year	*p* value DF χ^2-statistic
low-reliability sources*1	**21 (10.79)** **35%**	8 (6.66) 21.6%	5 (9.53) 9.4%	**0 (7.02)** **0%**	***p* < 0.0001** DF*1 = 6 χ^2 = 42.101
both low- & high-reliability sources*1	28 (23.49) 46.7%	16 (14.49) 43.2%	**12 (20.75)** **22.6%**	18 (15.27) 46.2%	
high-reliability sources*1	**11 (25.71)** **18.3%**	13 (15.86) 35.1%	**36 (22.71)** **67.9%**	21 (16.71) 53.8%	

*1; We divided the subjects into three groups by the sources they often use for report assignments: "low-reliability sources," "high-reliability sources," and "both low- & high-reliability sources." Participants in the "low-reliability sources" accessed sources, including Wikipedia, Yahoo Chiebukuro (Yahoo Answers), and Matomesaito (a summary on a website). Participants in the "high-reliability sources" group accessed direct sources, including Japanese government sites and research paper search engines. Participants in the "both low- & high-reliability sources" group accessed sources from news websites.
DF, degree of freedom

Table 6. Relationship among the three groups of sources often used for report assignments and participation in the "Medical Literature Reading" course (observed frequency (expected frequency), %)

The source reliability*1	Students who took the course*2	Students who did not take the course*3	*p* value DF χ^2-statistic
low-reliability sources*1	**0 (4.68)** **0%**	**34 (29.32)** **20.9%**	*p* = **0.03** DF*4 = 2 χ^2 = 7.048
both low- & high-reliability sources*1	11 (10.2) 42.3%	63 (63.8) 38.7%	
high-reliability sources*1	15 (11.1) 57.7%	66 (69.9) 40.5%	

*1; We divided the subjects into three groups by the sources they often use for the report assignments: "low-reliability sources," "high-reliability sources," and "both low- & high-reliability sources." Participants in the "low-reliability sources" group accessed Wikipedia, Yahoo Chiebukuro (Yahoo Answers), and Matomesaito (a summary on a website). Participants in the "high-reliability sources" group accessed direct sources, including Japanese government sites and the research paper search engines. Participants in "both low- & high-reliability sources" group accessed sources from news websites.
*2; Only third- and fourth-year students took the "Medical Literature Reading" course.
*3; Only first- and second- year students did not take the "Medical Literature Reading" course.
*4; DF, degree of freedom

Two of the key elements of media literacy, "b) the media constructs social realities," and "e) each medium has a unique mode," were found to be more effective in fourth-year students than in first- or second-year students. Those participants who understood the possibility of media manipulation had higher scores for the key element "b" of media literacy than participants who did not understand it. First-year students seemed to glean information passively from SNS, and it was difficult for them to pick reliable sources critically. Minagawa mentioned that many university students believed the newspapers and NHK, a TV program, were knowledgeable and reliable[20]. This trend can also be seen according to Internet sources; if famous and popular influencers mention something on SNS, it is easily believed and spreads quickly[21]. Background music is also known to affect the impression of information[22] or even the impression of an academic task[23].

Table 7. Differences in media literacy scale scores among students by use of ChatGPT for report assignments (means ± SD)

Media Literacy Scale*	Students who used ChatGPT (n = 74)	Students who never used ChatGPT (n = 121)	p value
Total scores	52.3 ± 6.31	53.0 ± 5.09	0.361
a) the media message is constructed	7.9 ± 1.87	7.9 ± 1.65	0.845
b) the media constructs social realities	7.9 ± 1.58	7.9 ± 1.46	0.909
c) the media message has commercial implications	9.9 ± 1.30	10.2 ± 1.30	0.069
d) the media message has an embedded ideology	8.8 ± 1.28	8.5 ± 1.42	0.108
e) each medium has a unique mode	9.7 ± 1.33	10.1 ± 1.30	0.059
f) people experience the same message differently	8.1 ± 2.00	8.4 ± 1.70	0.283

*; The media literacy scale is an 18-item measure and consists of 6 key elements of media literacy such as a) the media message is constructed; b) the media constructs social realities; c) the media message has commercial implications; d) the media message has an embedded ideology; e) each medium has a unique mode; and f) people experience the same message differently.

We also asked if students compared the information obtained to that from other sources when using Internet resources. Most students answered yes to this question, but the kind of websites chosen differed among respondents. For example, first- and second-year students chose non-reliable sources such as Wikipedia, Yahoo Chiebukuro (Yahoo Answers), and Matomesaito (a summary on a website), whereas older students preferred high-reliable sources, such as the Japanese government sites and search engines for research papers. It is essential for students to demonstrate evidence supporting their actions during the clinical practicum and report assignments, which may be why older students tend to utilize high-reliability sources.

In addition, we asked if students had ever used ChatGPT for report assignments, with approximately 40% answering that they had. Media literacy scores were lower among ChatGPT users than among those who did not use it. Participants who had used ChatGPT before probably did not understand its unique characteristics. According to previous research[24], 40% of males and 20% of females in their teens and 20s use ChatGPT to some degree. The current research shows that other generations are also increasingly using ChatGPT. Artificial intelligence (AI) tools, including Chat GPT, can be useful if users know about them in detail. However, we must still learn critical evaluation skills before implementing them in education, as every AI tool functions differently, even when using the same keywords, and do not always provide correct answers[25].

Senior students seemed to have better knowledge and found it easier to translate knowledge into action than younger students, as they were learning how to criticize and choose reliable content continuously[26]. Notably, people with higher levels of media literacy showed an improved ability to identify fake news. However, effective interventions for improving media literacy remain insufficient, although gaming interventions seem to be somewhat effective[27].

Relationship between information literacy courses and media literacy

A university course regarding information literacy was found to influence students' media literacy in the present study, similar to the findings of previous research[15]. The participants who took the subject had higher scores in media literacy, especially three of the key elements: "a) the media message is constructed," "b) the media constructs social realities," and "e) each medium has a unique mode." Through the course, students learned that 99% of information on the Internet is not academic. They also learned how to critically parse information on a given subject. Students were trained through this course to determine if the authors' views were presented subjectively or objectively. This is also why participants who took the subject tended to access high-reliability sources. Our findings proved that courses related to information literacy had some effect on improving media literacy.

High media literacy is crucial for judging the reliability of information in an emergency, such as a pandemic or earthquake. Over 60% of participants in the present study felt that they were using the Internet correctly. However,

not all media literacy levels were high. According to a previous research[28], 77.5% of people believed they had access to reliable information, even though this was actually false. Identifying correct information among false information in an emergency is even more challenging than under normal circumstances. Avoiding confusion, as occurred during the COVID-19 pandemic and Noto earthquake[6–9], is essential for cultivating media literacy among younger generations. Lu *et al.* mentioned that the games seem to be an effective tool for improving media literacy[27]. We further suggest that courses such as the one presented here provided by universities also be used to improve media literacy. Medical education has incorporated games into its curricula, and students can improve their media literacy by studying appropriate subjects using technology-enhanced active learning and multimedia education tools, as in the present case[29].

Finally, we suggest a combination strategy in which continuing experience and knowledge help improve media literacy, which is essential and valuable for correctly judging the reliability of information in emergencies.

Several limitations associated with the present study warrant mention. The departments to which participants belonged and universities involved need to be diversified. In the present study, all participants belonged to the nursing department of a single university. Furthermore, most participants in this study were female, so more male students should be included. Future longitudinal studies including more male students may help confirm strategies to improve media literacy in younger generations.

Conclusions

In conclusion, we examined whether or not attitudes toward accessing information or university courses related to information literacy had a relationship with media literacy. Media literacy was therefore found to improve with the school year, namely, as students matured they tended to use media sources more prodently. Completing report assignments and taking courses related to information literacy affect media literacy. Combining continuing experience and knowledge is expected to help people improve their media literacy, which is essential and valuable for correctly judging information during emergencies. Further studies are required to examine this strategy in more detail.

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Author Contributions

All authors contributed directly to this study. WY. and YN. designed the study and collected the data. WY. and YN. analyzed the data, and YT. took responsibility for the integrity of data analysis. All the authors drafted the manuscript. This study was conducted as a graduation thesis under the supervision of YT.

Conflict of Interest

The authors declare no economic or academic conflict of interest for this study.

References

1. The spread of the Internet and the change in the way of communication (Internet no Tojo, funky to communication no henka). Ministry of Internal Affairs and Communications. https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r01/html/nd111120.html. (accessed on 20 Feb 2025) (in Japanese)
2. Azu MC, Lilley EJ, Kolli AH. Social media, surgeons, and the Internet: an era or an error? The American Surgeon 78; 2012. DOI: 10.1177/000313481207800537.
3. The survey research on disinformation at domestic and overseas in 2021 (Reiwa 3 nendo Kokunaigai ni okeru gizyouhou ni kansuru isikityousa). Mizuho Research & Technologies. https://www.soumu.go.jp/main_content/000820953.pdf. (accessed on 8th Oct 2024) (in Japanese)

4. Borges do Nascimento IJ, Pizarro AB, Almeida JM, et al. Infodemics and health misinformation: a systematic review. Bull World Health Organ 100(9); 544–561: 2022. DOI: 10.2471/BLT.21.287654.
5. Infodemic. World Health Organization. https://www.who.int/health-topics/infodemic#tab=tab_1. (accessed on 25th Sep 2024)
6. Bak CK, Krammer JØ, Dadaczynski K, et al. Digital health-literacy and information-seeking behavior among university college students during the COVED-19 pandemic: a cross-sectional study from Denmark. Int J Environ Res Public Health 19; 1–16: 2022.
7. Dadaczynski K, Okan O, Messer M, et al. Digital health literacy and web-based information-seeking behaviors of university students in Germany during the COVID-19 pandemic: cross-sectional survey study. J Med Internet Res 23; 1–16: 2021. DOI: 10.2196/24097.
8. Vrdelja M, Vrbosek S, Klopcic V, et al. Facing the growing COVID-19 infodemic: digital health literacy and information-seeking behaviour of university students in Slovenia. Int J Environ Res Public Health 18; 1–16: 2021.
9. How to deal with false information in emergencies (Reiwa 6 nendo ban Jouhou Tsushin Hakusho, Saigaiji ni okeru nise/go jouhou eno taiou). The Ministry of Internal Affairs (Soumu sho). https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r06/html/nd122c00.html. (accessed on 25th Sep 2024) (in Japanese)
10. Venegas-Vera AV, Colbert GB, Lerma EV. Positive and negative impact of social media in the COVID-19 era. Rev Cardiovasc Med 21; 561–564: 2020. DOI: 10.31083/j.rcm.2020.04.195.
11. Ma Z, Zhou W, Deng X, et al. Community disaster resilience and risk perception in earthquake-stricken areas of China. Disaster Med Public Health Prep 17; 1–11: 2022. DOI: 10.1017/dmp.2021.342.
12. Kubota M. What the making process for doing report assignment of the college students completing their first year? (Shonennji shuuryou wo mukaeru daigakusei ha report kadaini taishite donoyouna sakusei process wo egakuka). Aichi Shukutoku university first-year education research annual report (Aichi Shukutoku daigaku shonenji kyouiku kenkyu nenpou) 13–16: 2023. (in Japanese)
13. McMahon KM, Schwartz J, Nilles-Melchert T, et al. YouTube and the Achilles Tendon: an analysis of internet information reliability and content quality. Cureus 14; e23984: 2022. DOI: 10.7759/cureus.23984.
14. Levin-Zamir D, Bertschi I. Media health literacy, eHealth literacy, and the role of the social environment in context. Int J Environ Res Public Health 15; 1643: 2018. DOI: 10.3390/ijerph15081643.
15. Yonezawa M. Instruction in information literacy using report writing as a starting point. Medical Library 54; 160–165: 2007. DOI: 10.7142/igakutoshokan.54.160. (in Japanese)
16. Kotera A. Development of a media literacy scale. Toyo Eiwa University Departmental Bulletin Paper 34; 89–106: 2016. (in Japanese)
17. Nakanishi A, Eto K, Takemi Y. Development of the dietary-related media literacy scale among junior high school students. Japanese Journal of Health Education and Promotion 20; 207–220: 2012. (in Japanese)
18. Goto Y. Development of the media literacy scale (Media literacy shakudo no sakusei ni kansuru kenkyu. Japan Society for Educational Technology 29; 77–80: 2005. (in Japanese)
19. Kanda Y. Investigation of the freely available easy-to-use software 'EZR' for medical statistics. Bone Marrow Transplant 48; 452–258: 2013.
20. Minagawa A. The reliability to the newspaper by college students—Through made use of newspapers—. Sojo University Department Bulletin Paper 40; 153–164: 2015. (in Japanese)
21. Blakemore JK, Bayer AH, Smith MB, et al. Infertility influencers: an analysis of information and influence in the fertility webspace. J Assist Reprod Genet 37; 1371–1378: 2020. DOI: 10.1007/s10815-020-01799-2.
22. Kwon YS, Lee J, Lee SS. The impact of background music on film audience's attentional processes: electroencephalography alpha-rhythm and event-related potential analyses. Front Psychol eCollection 13; 933497: 2022. DOI: 10.3389/fpsyg.2022.933497.
23. Balıkçı İ, Tok S, Binboğa E. The effect of background audio and audiovisual stimuli on students' autonomic responses during and after an experimental academic examination. Brain Behav 13; e3153: 2023. DOI: 10.1002/brb3.3153.
24. Chat GPT usage trends in Japan (June 2023) ~usage rates are increasing that is centered around young generations. Nomura Research Institute. https://www.nri.com//media/Corporate/jp/Files/PDF/knowledge/report/cc/digital_economy/20230622_1.pdf?la=ja-JP&hash=629B1BE5964630. (accessed on 1st Oct 2024) (in Japanese)
25. Rossettini G, Rodeghiero L, Corradi F, et al. Comparative accuracy of ChatGPT-4, Microsoft Copilot and Google Gemini in the Italian entrance test for healthcare sciences degrees: a cross-sectional study. BMC Med Educ 24; 694: 2024. DOI: 10.1186/s12909-024-05630-9.
26. Groller KD, Adamshick P, Petre K. Embracing evidence-based nursing and informational literacy through an innovative undergraduate collaborative project. Int J Nurs Educ Scholarsh 17; 2020. DOI: 10.1515/ijnes-2019-0138.

27. Lu C, Hu B, Bao MM, et al. Can media literacy intervention improve fake news credibility assessment? A meta-analysis. Cyberpsychol Behav Soc Netw 4; 240–252: 2024. DOI: 10.1089/cyber.2023.0324.
28. The reality of Fake news in Japan and measures to address it. (Nippon ni okeru fake news no jittai to taishosaku) Innovation Nippon. https://www.glocom.ac.jp/wp-content/uploads/2020/10/2019IN_report_full.pdf. (accessed on 1st Oct 2024) (in Japanese)
29. Krishnamurthy K, Selvaraj N, Gupta P, et al. Benefits of gamification in medical education. Clin Anat 35; 795–807: 2022. DOI: 10.1002/ca.23916.