Association between Health Literacy and Office Syndrome Prevention Behaviors among University Students

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Abstract

This analytical cross-sectional study examined the relationship between health literacy and office syndrome prevention behaviors among 332 university students in the College of Allied Health Sciences. Data were collected using a structured online questionnaire assessing demographic characteristics, six domains of health literacy, and prevention behaviors. Descriptive statistics, chi-square tests, and Pearson's correlation were applied.

Most participants reported high daily screen exposure, and prevention behaviors were predominantly at a moderate level. Significant differences across academic years were found in several health literacy domains, including access to information, knowledge and understanding, decision-making, and overall health literacy. However, prevention behaviors did not differ by year of study. The overall association between total health literacy and prevention behaviors was weak and nonsignificant ($r = 0.086$, $p = 0.117$). Among individual domains, knowledge and understanding and self-management showed the strongest positive associations with preventive behaviors, while access to information alone did not predict action.

These findings indicate that information exposure is insufficient to influence ergonomic practices without corresponding skills to interpret and apply health information. Strengthening practical competencies particularly comprehension, critical appraisal, and self-management may be more effective than information-focused approaches. Given the high prevalence of prolonged screen use, universities should prioritize health literacy programs that integrate applied ergonomic training and promote supportive environments to reduce office syndrome related risks among students.

Keyword: Health literacy, Preventive behavior, Office syndrome, University Students

1. Introduction

The rapid digitalization of daily life has reshaped how university students work, study, and engage with technology. Extended periods of sitting, repetitive upper-body movements, and ergonomically inappropriate workstations have contributed to an increased burden of musculoskeletal discomfort commonly described as Office Syndrome. Typical symptoms including neck, shoulder, and lower-back pain are often exacerbated by prolonged screen exposure and poor posture, and may progress to chronic problems when ergonomic risks are not addressed (Demissie et al., 2024; Phoonjaroen et al., 2025; Veshovda et al., 2023).

University students represent a population particularly vulnerable to these risks. Recent studies report a high prevalence of musculoskeletal pain among undergraduates, frequently exceeding 60-80% within a 12-month period, especially in students with high academic workload and extended screen use (Alanazi et al., 2025; Kandasamy et al., 2024). Patterns of media consumption including heavy smartphone and social media use have further been linked with an elevated risk of musculoskeletal disorders among health sciences students (Nochian et al., 2024).

Health literacy, defined as the ability to access, understand, appraise, and apply health information, has become an important determinant of individuals' capacity to adopt preventive behaviors. Evidence suggests that higher health literacy is associated with improved musculoskeletal outcomes and greater engagement in health-promoting practices (Gernert et al., 2022; Veshovda et al., 2023). In Thailand, a recent study among nursing students demonstrated moderate levels of health literacy and prevention behaviors related to Office Syndrome, with a positive association between the two (Kaewmit et al., 2024; Thongmeekhaun et al., 2018).

Despite these findings, research directly examining how health literacy relates to Office Syndrome prevention behaviors among allied health students remains limited. This group is noteworthy because long hours spent in lectures, laboratory sessions, and computer-based tasks place them at elevated ergonomic risk, while their future roles as health professionals make their knowledge and behaviors particularly consequential. Therefore, this study aims to investigate the association between health literacy and Office Syndrome prevention behaviors among students in the College of Allied Health Sciences. The results are expected to inform targeted educational and ergonomic interventions to support healthier learning environments for university students.

Research Objective

1. To examine the level of health literacy regarding Office Syndrome among university students.

2. To assess Office Syndrome prevention behaviors among students in the College of Allied Health Sciences.

3. To investigate the relationship between health literacy and Office Syndrome prevention behaviors among university students.

2. Methods

This analytical cross-sectional study was conducted in December 2024 using a self-administered online questionnaire to examine the association between health literacy and Office Syndrome prevention behaviors among students in the College of Allied Health Sciences. The study population consisted of 804 students enrolled in Years 1-4 during the 2024 academic year. The required sample size was calculated using the population proportion formula in the n4Studies program with the parameters $N = 804$, $Z = 1.96$, $p = 0.432$ (Photihung et al., 2021), and $d = 0.05$. The minimum sample required was 257, and an additional 10% was added to compensate for potential nonresponse, resulting in a final target of at least 283 participants.

A stratified random sampling approach based on year of study was applied. Proportional allocation was used to determine the number of students required from each academic year,

followed by simple random sampling within each stratum using computer-generated random numbers to ensure equal selection probability.

Data were collected through a structured online questionnaire comprising three sections. The first section gathered demographic information, including sex, age, academic program, year of study, average daily screen time, and usual leisure activities. The second section assessed health literacy related to Office Syndrome using 30 items across six domains: access to health information and services, knowledge and understanding, communication skills, decision-making skills, media literacy, and self-management. Items were rated on a five-point scale, and domain scores were classified into low, moderate, or high levels based on the mean and half-standard deviation. The final section measured Office Syndrome prevention behaviors through 10 items assessing both the frequency of preventive actions and agreement with preventive statements; higher scores indicated stronger prevention behaviors.

Data were collected via Google Forms. Prior to participation, students received information about the study and provided electronic informed consent. Participation was voluntary, anonymous, and confidential, and students were free to withdraw at any point without penalty. Individuals who declined consent or were unable to complete the questionnaire were excluded. All data were used solely for research purposes.

Data analysis included descriptive statistics (frequency, percentage, mean, standard deviation) to summarize participant characteristics, health literacy levels, and prevention behaviors. Pearson's correlation coefficient was used to examine the association between overall health literacy and prevention behaviors. In addition, chi-square tests were applied to compare health literacy levels and prevention behavior categories across year groups. Statistical significance was set at $p < 0.05$.

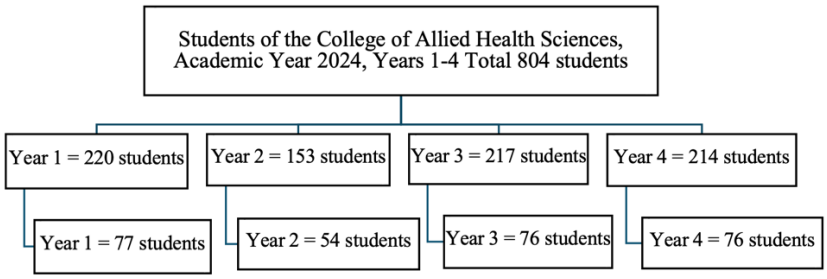


Figure 1 Population and Stratified Sample Distribution of Allied Health Science Students

3. Result

A total of 332 university students, aged 18-23 years, participated in the study. Most were female (87.4%). Screen time was high overall, with 34.3% reporting 4-6 hours per day and 33.8% reporting more than 6 hours. Leisure activities were dominated by social media use (62.7%), whereas only 7.2% engaged in exercise or physical activity. Patterns were consistent across all year levels. (Table1)

Overall health literacy among the 332 participating students varied across the six assessed domains. Most domains showed a distribution centered around the moderate level, with smaller proportions falling into the high and low categories. Differences by year of study were

observed in several domains. In the area of Access to Health Information, the distribution differed significantly across year levels (p = 0.047). A similar pattern of year-level variation was noted for Knowledge and Understanding (p = 0.001). For Communication Skills, the distribution across levels did not differ significantly among the four years (p = 0.202). Year-level differences were also found for Decision-Making Skills (p = 0.003), while Media Literacy showed no statistically significant variation (p = 0.257). Self-Management similarly showed no significant difference across years (p = 0.055). When considering the overall health literacy score, the distribution across levels varied significantly by year of study (p = 0.009). (Table2)

Table1: Participant Characteristics by Year of Study (n = 332)

Variable	Year of Study n (%)				
	Total	Year1	Year2	Year3	Year4
Gender					
Male	42 (12.6)	10 (9.4)	10 (16.7)	9 (10.7)	13 (16.1)
Female	290 (87.4)	97 (90.6)	50 (83.3)	75 (89.3)	68 (83.9)
Daily screen time					
Less than 2 hours	22 (6.6)	8 (7.5)	4 (6.7)	7 (8.3)	3 (3.7)
2-3 hours	84 (25.3)	26 (24.3)	14 (23.3)	22 (26.2)	22 (27.2)
4-6 hours	114 (34.3)	36 (33.6)	20 (33.3)	24 (28.6)	34 (41.9)
More than 6 hours	112 (33.8)	37 (34.6)	22 (36.7)	31 (36.9)	22 (27.2)
Leisure activities					
Exercise/Physical activity	24 (7.2)	6 (5.6)	10 (16.7)	5 (5.9)	3 (3.7)
Reading or watching movies	100 (30.1)	40 (37.4)	19 (31.6)	24 (28.6)	17 (21.0)
Using social media	208 (62.7)	61 (57.0)	31 (51.7)	55 (65.5)	61 (75.3)

Table2: Distribution of Health Literacy Levels Across Six Domains by Year of Study (n = 332)

Variable	Year of Study n (%)					P-value [a]
	Total	Year1	Year2	Year3	Year4	
Access to Health Information (M=18.0, S.D. =3.6, Min=6, Max=25)						0.047
Low level	122 (36.7)	45 (42.1)	29 (48.3)	24 (28.6)	24 (29.6)	
Moderate level	81 (24.4)	30 (28.0)	12 (20.0)	20 (23.8)	19 (23.5)	
High level	129 (38.9)	32 (29.9)	19 (31.7)	40 (47.6)	38 (46.9)	
Knowledge and Understanding (M=20.3, S.D.=3.7, Min=7 Max=25)						0.001
Low level	94 (28.3)	38 (35.5)	26 (43.3)	11 (13.1)	19 (23.5)	
Moderate level	109 (32.8)	35 (32.7)	18 (30.0)	33 (39.3)	23 (28.4)	
High level	129 (38.9)	34 (31.8)	16 (26.7)	40 (47.6)	39 (48.1)	
Communication Skills (M=16.7, S.D.=2.2, Min=11, Max=25)						0.202
Low level	100 (30.1)	34 (31.8)	21 (35.0)	24 (28.6)	21 (25.9)	
Moderate level	146 (44.0)	37 (34.6)	27 (45.0)	40 (47.6)	42 (51.8)	
High level	86 (25.9)	36 (33.6)	12 (20.0)	20 (23.8)	18 (22.2)	
Decision-Making Skills (M=20.1, S.D.=3.5, Min=5, Max=25)						0.003
Low level	92 (27.7)	36 (33.6)	25 (41.7)	14 (16.7)	17 (21.0)	
Moderate level	124 (37.4)	39 (36.5)	23 (38.3)	30 (35.7)	32 (39.5)	
High level	116 (34.9)	32 (29.9)	12 (20.0)	40 (47.6)	32 (39.5)	
Media Literacy (M=17.6 SD=2.26 Min=9 Max=24)						0.257
Low level	104 (31.3)	36 (33.6)	24 (40.0)	20 (23.8)	24 (29.6)	
Moderate level	125 (37.7)	43 (40.2)	21 (35.0)	35 (41.7)	26 (32.1)	
High level	103 (31.0)	28 (26.2)	15 (25.0)	29 (34.5)	31 (38.3)	
Self-Management (M=19.5, S.D.=3.4, Min=5, Max=25)						0.055

Low level	121 (36.5)	43 (40.2)	28 (46.7)	20 (23.8)	30 (37.0)	
Moderate level	101 (30.4)	33 (30.8)	19 (31.7)	28 (33.3)	21 (26.0)	
High level	110 (33.1)	31 (29.0)	13 (21.6)	36 (42.9)	30 (37.0)	
Overall health literacy (M= 112.3, S.D. =14.5, Min=53, Max=144)						0.009
Low level	97 (29.2)	38 (35.5)	23 (38.3)	16 (19.0)	20 (24.7)	
Moderate level	126 (38.0)	40 (37.4)	26 (43.3)	34 (40.5)	26 (32.1)	
High level	109 (32.8)	29 (27.1)	11 (18.3)	34 (40.5)	35 (43.2)	

[a] *chi-square test*

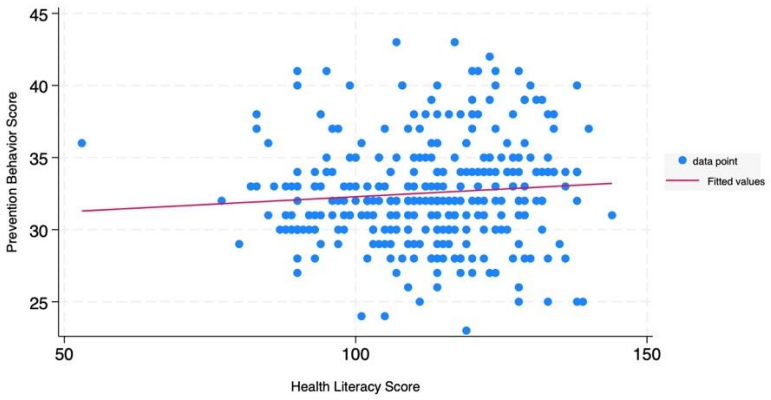
Overall, office syndrome prevention behaviors among the 332 participating students were distributed across low, moderate, and high levels. Nearly half of the students demonstrated moderate prevention behaviors (48.5%), followed by 35.2% in the high-level category and 16.3% in the low-level group.

When classified by academic year, a similar pattern was observed across all four year levels, with moderate behaviors being the most common in each group. The proportion of students with high prevention behaviors ranged from 30.9% to 42.1%, while those with low behaviors ranged from 8.3% to 21.4%. Statistical testing indicated no significant differences in prevention behavior levels across year groups (p = 0.169). (Table3)

Table3: Office Syndrome Prevention Behavior Levels by Year of Study

Variable	Year of Study n (%)					P-value [a]
	Total	Year1	Year2	Year3	Year4	
Office Syndrome Prevention Behaviors						0.169
Low level	54 (16.3)	15 (14.0)	5 (8.3)	18 (21.4)	16 (19.7)	
Moderate level	161 (48.5)	47 (43.9)	36 (60.0)	38 (45.2)	40 (49.4)	
High level	117 (35.2)	45 (42.1)	19 (31.7)	28 (33.3)	25 (30.9)	

[a] *chi-square test*



(r = .086, p = .117)

Figure 2: Scatterplot of the Relationship Between Health Literacy and Office Syndrome Prevention Behaviors

Pearson correlation analysis demonstrated that overall health literacy was not significantly associated with Office Syndrome prevention behaviors among students (r = 0.086, p = 0.117).

The scatterplot supported this finding, showing a very weak positive trend with no meaningful linear pattern.(Figure 2)

Overall, the health literacy domains were strongly interrelated. Access to Health Information showed moderate to strong correlations with other domains, particularly Knowledge and Understanding ($r = 0.52$, $p < 0.01$), Media Literacy ($r = 0.56$, $p < 0.01$), and Self-Management ($r = 0.51$, $p < 0.01$). Knowledge and Understanding was also positively associated with several domains, including Decision-Making Skills ($r = 0.75$, $p < 0.01$) and Media Literacy ($r = 0.56$, $p < 0.01$).

Communication Skills demonstrated weaker but significant associations with other health literacy components, ranging from $r = 0.14$ to $r = 0.40$ ($p < 0.05$). Decision-Making Skills had moderate to strong correlations with all domains ($r = 0.33–0.68$, $p < 0.01$). Media Literacy and Self-Management also showed strong inter-domain relationships ($r = 0.42–0.69$, $p < 0.01$).

Regarding Office Syndrome prevention behaviors, only weak correlations were observed. Self-Management showed the strongest association ($r = 0.14$, $p < 0.05$), followed by Communication Skills ($r = 0.11$, $p < 0.05$). Other domains demonstrated minimal or nonsignificant relationships with prevention behaviors. (Table4)

Table4: Pearson's Correlation Coefficients Between Health Literacy Domains and Office Syndrome Prevention Behaviors

Health Literacy Domains	1	2	3	4	5	6	7
1. Access to Health Information	—						
2. Knowledge and Understanding	0.52**	—					
3. Communication Skills	0.14*	0.40**	—				
4. Decision-Making Skills	0.50**	0.75**	0.33**	—			
5. Media Literacy	0.56**	0.56**	0.29**	0.62**	—		
6. Self-Management	0.51**	0.60**	0.34**	0.68**	0.69**	—	
7. Prevention Behaviors	–0.02	0.06	0.11*	0.05	0.08	0.14*	—

Note. p <0 .05, p <0 .01***

4. Discussion

The present study found that university students demonstrated varied levels of health literacy related to office syndrome, while prevention behaviors were predominantly at a moderate level. This pattern is similar to findings reported by Photihung et al. (2021), who observed that supportive university personnel likewise showed moderate levels of health literacy and preventive behaviors. Together, these results suggest that musculoskeletal-related health literacy is generally modest across different university populations in Thailand, regardless of age or job role. The relatively stable patterns across academic years in the present study further indicate that progression through a health sciences curriculum does not automatically lead to improved ergonomic practices, underscoring the need for structured educational interventions. A notable finding of this study is the absence of a significant association between access to health information and prevention behaviors. This aligns closely with the results of Photihung et al. (2021), who found no relationship between access to information and office syndrome prevention behaviors. Both studies point to the same

phenomenon: students and staff may have abundant access to health information, but information exposure alone is insufficient to drive behavioral change. This conclusion is further supported by Songsin et al. (2025), who reported that Thai youth with high information exposure did not necessarily adopt preventive behaviors. Collectively, these findings reinforce the viewpoint that meaningful behavioral change requires skill-based competencies critical appraisal, comprehension, and application rather than passive information access (WHO, 2021).

Among the health literacy domains, knowledge and understanding and self-management emerged as the strongest correlates of prevention behaviors. This is consistent with Photihung et al. (2021), who also identified self-management and decision-making as significant predictors of office syndrome prevention behaviors in university personnel. These findings align with theoretical models emphasizing that deeper comprehension and applied self-regulation are essential for translating health literacy into action (Nutbeam & Lloyd, 2021). Self-management skills such as adjusting posture, taking breaks, and performing stretching exercises represent practical expressions of applied health literacy and have been associated with reduced musculoskeletal discomfort in both student and working populations (Chih et al., 2016; Sharma et al., 2024).

Communication skills, decision-making, and media literacy showed weaker but meaningful associations in this study. Although these domains may not directly predict prevention behaviors, they may facilitate indirect pathways by helping students evaluate ergonomic information or seek clarification from peers and professionals. Prior work suggests that health-related decision-making and communication are particularly important for applying ergonomic recommendations in real-world settings (Photihung et al., 2021; Yeung et al., 2022).

The high prevalence of screen exposure and sedentary behavior observed in the present study reflects contemporary patterns among university students in Thailand and internationally. Prolonged static postures and extensive digital device use conditions documented as risk factors for musculoskeletal problems (Kandasamy et al., 2024; Fagarasanu & Kumar, 2020) underscore the urgency of implementing practical ergonomic interventions. Educational institutions should consider combining health literacy programs with environmental supports such as ergonomic classroom design, scheduled movement prompts, and digital well-being tools.

This study has limitations. Its cross-sectional design restricts causal inference. Self-reported data may be prone to recall or social desirability bias, and the single-institution sample limits generalizability. Unmeasured psychosocial factors, such as perceived susceptibility or academic workload, may also influence preventive behaviors. Future studies should employ longitudinal or interventional designs, incorporate objective ergonomic assessments, and evaluate digital tools such as posture-monitoring applications to support behavior change.

Overall, the findings from this study, together with evidence from Photihung et al. (2021) and other recent research, indicate that strengthening deeper components of health literacy particularly comprehension, critical appraisal, decision-making, and self-management is essential for promoting office syndrome prevention behaviors among university students. Interventions focused solely on information dissemination are unlikely to be effective without parallel efforts to build practical skills and supportive environments.

5. Conclusion

This study demonstrated that university students generally exhibited moderate levels of office syndrome prevention behaviors, with knowledge and understanding and self-management emerging as the most influential health literacy components. These findings are consistent with prior Thai evidence showing that deeper comprehension and applied self-regulation, rather than mere information access, are the most meaningful drivers of preventive action. The lack of association between access to health information and prevention behaviors reinforces that information abundance alone is insufficient; students must possess the skills to critically appraise and apply ergonomic guidance in daily activities. Weaker but relevant contributions from communication, media literacy, and decision-making suggest that these domains may support prevention indirectly by enabling students to navigate and interpret health information more effectively. Given students' high levels of screen exposure and limited physical activity, universities should prioritize interventions that emphasize practical ergonomic skills, critical health literacy, and self-management strategies within supportive learning environments. Strengthening these competencies offers a promising path to reducing musculoskeletal risks and promoting sustainable preventive behaviors among university students.

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References

Alanazi, N., Alqahtani, S. M., Alshammari, F. S., & Alanazi, Y. (2025). Prevalence and risk factors of musculoskeletal pain among university students. *BMC Musculoskeletal Disorders, 26*(1), 112–121.

Chih, Y. Y., Chen, L. R., & Chen, C. H. (2016). The relationship between health literacy and adherence to preventive behaviors among workers with musculoskeletal disorders. *Industrial Health, 54*(2), 106–114. https://doi.org/10.2486/indhealth.2015-0052

Demissie, A., Gebrehiwot, E., Tesfaye, T., & Simegn, G. (2024). Computer use, ergonomics, and musculoskeletal pain among office workers. *International Journal of Environmental Research and Public Health, 21*(4), 221.

Fagarasanu, M., & Kumar, S. (2020). The biomechanics of prolonged static postures and their role in musculoskeletal disorders: An evidence-based review. *Ergonomics, 63*(5), 579–596. https://doi.org/10.1080/00140139.2019.1695198

Gernert, M., Schmidt, K. H., & Hänel, M. (2022). Health literacy and work ability in adults with health-related risk factors**.** *Journal of Occupational Health, 64*(1), e12345.

Kaewmit, J., Chaiwong, N., & Chaiprasert, S. (2024). Health literacy and Office Syndrome prevention behaviors among nursing students. *Journal of Nursing and Health Care, 42*(1), 55–67.

Kandasamy, S., Shankar, S., & Raghavan, R. (2024). Musculoskeletal pain and associated factors among university students. *Journal of Bodywork and Movement Therapies, 35*, 148–155.

Nochian, J., Rahmati, M., & Hosseini, S. (2024). Problematic internet use and musculoskeletal disorders among health sciences students. *BMC Public Health, 24*(1), 552.

Nutbeam, D., & Lloyd, J. E. (2021). Understanding and responding to health literacy as a social determinant of health. *Annual Review of Public Health*, 42, 159-173. https://doi.org/10.1146/annurev-publhealth-090419-102529

Photihung, P., Damnong, N., & Tassanatanachai, A. (2021). Relationship between health literacy related to office syndromes and office syndrome prevention behavior among supportive personnel at a university. *Thai Red Cross Nursing Journal*, 14(2), 235–250.

Phoonjaroen, T., Siripornpanich, V., & Nualnim, S. (2025). Ergonomic risk and musculoskeletal symptoms in Thai computer users. *Safety and Health at Work, 16* (2), 133–141.

Sharma, P., Kumar, S., & Al-Kuwari, M. G. (2024). Ergonomic awareness and preventive practices among university students: Implications for musculoskeletal health. *Journal of Bodywork and Movement Therapies, 38*, 45–53. https://doi.org/10.1016/j.jbmt.2023.12.008

Songsin, N., Boonchieng, W., & Runnuch, R. (2025). The relationship between health literacy and preventive behaviors towards COVID-19 among rural Thai youth: A cross-sectional study. Journal of Nursing and Midwifery Sciences, 12 (4), e163823. https://doi.org/10.5812/jnms-163823

Thongmeekhaun, T., & Saetiaw, S. (2018). Prevention behaviors and risk perceptions of occurrence of computer syndrome among supporting staffs. Journal of Nursing, Siam University, 19 (3), 69-83.

Veshovda, A., Lunde, K. B., & Larsen, T. M. (2023). Health literacy and musculoskeletal disorders among adolescents. *Health Education Research, 38*(2), 125–135.

World Health Organization. (2021). *Health literacy toolkit for low- and middle-income countries: A series of information sheets to empower communities and strengthen health systems* (2nd ed.). WHO Regional Office for South-East Asia. https://apps.who.int/iris/handle/10665/343351

Wu, X., Tao, S., Zhang, Y., Zhang, S., & Tao, F. (2021). Low health literacy and health-risk behaviors among Chinese college students. *Journal of American College Health, 69*(6), 627–636. https://doi.org/10.1080/07448481.2019.1705847

Yeung, S. S., Chan, R. H., & Wai, E. K. (2022). Digital health literacy and health behaviors among university students. *BMC Public Health, 22*(1) , 1204. https://doi.org/10.1186/s12889-022-13533-0