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Article

Association Between Online Health Misinformation Susceptibility and Health Risk Behaviors and Vaccine Hesitancy: A Cross-Sectional Study Among Nurses in Greece

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Highlights

What are the main findings?

- The nurses who demonstrated increased vulnerability to online health misinformation showed both less effective health behavior patterns and diminished capacity to handle their stress-related behaviors.
- The nurses who encountered greater challenges in distinguishing between false information sources demonstrated higher levels of vaccine hesitancy.

What are the implications of the main findings?

- Reduced online health misinformation enables nurses to enhance their health practices and build vaccine trust.
- The vaccination promotion efforts of nurses become more successful when they develop better digital health literacy skills and their ability to handle health misinformation.

Abstract

Background/Objectives: Online health misinformation is an emerging public health concern, as it may influence health behaviors and vaccination decisions. This study addresses how susceptibility to online health misinformation shapes nurses' health behaviors and attitudes toward vaccination. **Methods:** A cross-sectional study was performed in Greece using an online questionnaire in September 2025. Online health misinformation susceptibility was measured with the Health-Related Online Misinformation Susceptibility Scale. Health behaviors were measured by the Health Behavior Inventory–Short Form (HBI-SF), and vaccine hesitancy was assessed through the Vaccine Hesitancy Scale (VHS). Multivariable analyses were performed to determine the independent effect of vulnerability to misinformation after adjusting for possible confounding variables. **Results:** The multivariable linear regression analyses showed that susceptibility to online health misinformation was positively associated with diet scores (adjusted beta = 0.033, 95% confidence interval [CI]: 0.016–0.051, $p < 0.001$) and anger and stress score (adjusted beta = 0.065, 95% CI: 0.047–0.082, $p < 0.001$). The misinformation susceptibility was positively associated with higher levels of vaccine hesitancy. In particular, we found a positive association between misinformation susceptibility and lack of confidence (adjusted beta = 0.021, 95% CI 0.012–0.030, $P < 0.001$) and risk perception (adjusted beta = 0.032, 95% CI: 0.022–0.042, $p = 0.001$). **Conclusions:** Our findings suggest that higher susceptibility to online health misinformation is linked to poorer health behaviors and greater vaccine hesitancy.

Keywords: health misinformation; susceptibility; health behaviors; vaccine hesitancy; nurses; fake news

1. Introduction

The most efficient public health measure against infectious diseases and their associated fatality rates and disability rates is vaccination which also helps establish global herd immunity protection. The maintenance of high vaccination rates serves dual purposes which protect individual health while preventing disease spread in medical facilities that treat patients with heightened risk of infection through their work. Healthcare workers make essential contributions to vaccination programs by their direct impact on public opinion about vaccines and their success in increasing vaccine acceptance among their patients [1,2].

Vaccine hesitancy continues to exist as a worldwide public health problem because people still do not believe in the established advantages of vaccination. Vaccine hesitancy exists when people postpone vaccination or choose not to get vaccinated while vaccination services remain accessible and the phenomenon depends on psychological and social and environmental factors which create unique contexts [3,4]. Vaccine hesitancy exists as a complex problem which researchers have studied through theoretical frameworks that identify three primary vaccination decision factors which include vaccine safety and effectiveness confidence and vaccine accessibility and perceived disease risk [5].

Healthcare professionals, including nurses, show vaccine hesitancy because research shows that vaccination rates differ significantly between different countries and various healthcare environments. Research shows that vaccination acceptance among healthcare workers depends on three factors which include their assessment of infection risk and their belief about vaccine effectiveness and their past vaccination record and their trust in health authorities [6,7]. Public concerns about vaccine safety during new pandemic outbreaks serve as major obstacles which prevent people from getting vaccinated according to research [8,9].

Vaccination intention depends on how healthcare workers and student groups perceive risks and practice protective health measures. University student populations demonstrate that students who perceive their personal risk to be low will engage in fewer preventive measures and they will also show decreased vaccination rates while students who have experienced COVID-19 cases will demonstrate increased protective behavior and higher vaccination rates [10]. The research results demonstrate the existence of a behavioral model which connects perceived risk to health behavior and vaccination decision-making.

The growing digital information environment has increased public contact with health misinformation because people already experience vaccine hesitancy. Online misinformation has evolved into a significant public health threat because it influences people's health beliefs and their knowledge about dangers and their actions toward preventive health measures which includes vaccination decisions [11,12]. Recent research shows that people who have difficulty determining what information is false become vulnerable to misinformation because their cognitive processes are affected by this exposure to false information. The Online Misinformation Susceptibility Scale was created to provide accurate methods for measuring how people conduct online information verification in various fields [13].

The emerging research shows that people who believe health-related falsehoods will develop incorrect health beliefs and fail to practice proper health protection methods and vaccination practices. Misinformation has been shown to create a cognitive effect that increases perceived accuracy because people believe repeated information to be true even when it contains falsehoods. Vaccine hesitancy arises from this situation because people who hear false vaccine information multiple times will develop more doubts about vaccine safety and vaccine effectiveness [12,14].

Social media platforms enable fast and widespread distribution of health misinformation, which leads to vaccine hesitancy because it destroys public trust in both scientific institutions and healthcare

systems [15]. Healthcare professionals show vaccine hesitancy because they doubt vaccine safety and effectiveness while they assess disease risk and their ability to obtain vaccines according to established vaccine hesitancy measurement frameworks [5,16].

Misinformation susceptibility links to two behavioral areas which include dietary practices and stress-related behaviors according to the evidence which supports the theory that misinformation functions as a health behavior risk element [17]. The current evidence shows that problematic social media usage patterns lead to mental health problems which include increased anxiety and depression symptoms together with degraded sleep quality, which supports the idea that digital behavioral vulnerabilities shape health behavior patterns and decision-making processes [18].

Researchers now acknowledge that misinformation affects health behavior and vaccination decision-making, yet they need to conduct further research to solve critical knowledge gaps. The current research studies vaccination refusal and health behavior as separate issues instead of investigating their combined effects. The research that investigates nurses who work in practice shows limited findings when compared to studies that involve general population samples and student groups [1,19]. The existing research base remains incomplete because most studies use cross-sectional methods which restrict researchers from determining how misinformation susceptibility connects to health behaviors and vaccine refusal through causal pathways [17].

Nurses need to understand how online health misinformation affects their vaccination willingness and health behavior patterns because they play a vital role in showing patients about health issues and vaccines and health communication. Public health professionals should use this research to find cognitively and behaviorally modifiable factors which will aid their efforts to boost vaccination rates and promote scientific health practices among medical staff [19]. Therefore, the aim of this study was to examine the impact of online health misinformation susceptibility on nurses' health behaviors and attitudes toward vaccination.

2. Materials and Methods

2.1. Study design

We performed a cross-sectional study in Greece, using an online survey that took place in September 2025. The survey was administered through Google Forms and disseminated on social media (Facebook, Instagram and LinkedIn), thus obtaining a convenience sample. Nurses were eligible if they had reported spending at least 30 minutes per day on the internet or social media to ensure a sufficient online activity history and has provided their informed consent before participation. The study was conducted in line with the STROBE guidelines [20]. Sample size was calculated using G*Power version 3.1.9.2. With seven variables in the multivariable analysis (one predictor and six confounding variable), we applied expected effect size as 0.04 on the association between predictor and outcome, a significance level of 5%, and statistical power at 95%, a minimum sample size of 327 nurses was estimated for the current study.

2.2. Measurements

Data on demographic characteristics were extracted, i.e. sex (male/female) and age as a continuous variable. Economic status was self-rated ranging from 0 (very poor) to 10 (excellent). Nurses rated their own level of digital literacy on a scale from 0 (very poor) to 10 (very good) and indicated the average hours spent per day using the internet and/or social media (treated as a continuous variable).

Online health misinformation susceptibility was measured by the Health-Related Online Misinformation Susceptibility Scale (HR-OMISS) [21]. The HR-OMISS is an adaptation of the Online Misinformation Susceptibility Scale (OMISS) [13] -which measures general susceptibility to online misinformation- and focuses on susceptibility to health-related misinformation. The instrument is composed of nine questions with answers varying from never (5) to always (1), in a Likert scale. Scores, which vary between 9 and 45, are higher for those more vulnerable to misleading health

information. In this study, the HR-OMISS was administered using the previously validated Greek version [21]. The Cronbach's alpha for the HR-OMISS was 0.883 in our sample.

Health behaviors were measured using the Health Behavior Inventory–Short Form (HBI-SF) [22]. The HBI-SF is composed of 12 items, scored on a seven-point Likert scale from 1=strongly disagree to 7=strongly agree. Six items are reverse scored, so that for higher scores to indicate higher health risk across all items. The instrument has four subscales: Diet (3 items), proper use of health care resources (3 items), anger and stress (3 items) and substance use (3 items). For each subscale, scores were computed by summing item values and dividing by the number of items within each particular subscale; this provided a composite score for each of the seven health risk behavior scores (subscales) that ranged from 1 to 7 on which higher scores are indicative of more problematic behaviors. The validated Greek version of the HBI-SF [23] was used. In this study, internal consistency for the four HBI-SF subscales was acceptable to good (Cronbach's alpha values ranged from 0.713 to 0.824).

Attitudes toward vaccination were assessed with the Vaccine Hesitancy Scale (VHS) [5]. The VHS is comprised of 10 items measured on a 5-point Likert scale from 1=strongly disagree to 5=strongly agree and seven items are reverse scored to ensure higher scores indicating greater vaccine hesitancy. It encompasses two sub-scales; lack of confidence (seven items) and risk perception (three items). Subscale scores were calculated as the sum of item responses divided by the number of items; sub-scale scores ranged from 1–5. We used the validated Greek VHS [16]. Internal consistency reliability was good for the “lack of confidence” subscale (Cronbach's $\alpha = 0.917$) and acceptable for the “risk perception” subscale (Cronbach's $\alpha = 0.704$) in our sample.

2.3. Ethical issues

The study protocol was officially approved by the Ethics Committee of the Faculty of Nursing, National and Kapodistrian University of Athens (approval number: 75/13.7.2025). The research was performed in compliance with the Code of Ethics of the Declaration of Helsinki [24]. Recruitment was based on a voluntary and anonymous basis and data were not collected until participants had been fully informed of the objectives and procedure of the study, with informed consent being obtained.

2.4. Statistical analysis

Categorical variables were described as absolute (n) and relative (%) frequency, and continuous variables as means $\pm$ standard deviation (SD) or median (interquartile range). The normality of continuous variables was tested using the Kolmogorov–Smirnov test and visual examination of Q–Q plots, revealing that data were normally distributed. Online health misinformation susceptibility was considered the independent variable and health behaviors as well as vaccine hesitancy were regarded as dependent variables and linear regression models were applied. First, univariate relationships were investigated with simple linear regression analyses. Multivariable linear regression models were then built to estimate the independent effect of susceptibility to health misinformation online while adjusting for potential confounding variables. Results are presented as unadjusted and adjusted beta coefficients with 95% confidence intervals (CI) and p-values. Collinearity among independent variables was tested using the Variance Inflation Factor (VIF) and values greater than 5 were considered to produce serious multicollinearity. In the current analyses, VIF values were acceptable. Pearson's correlation coefficients were calculated for correlations between normally distributed scale scores as well. Probability value of less than 0.05 were considered to be statistically significant. Statistical analyses were conducted using IBM SPSS Statistics for Windows, version 28.0 (IBM Corp., Armonk, NY: IBM Corp).

3. Results

3.1. Demographic characteristics

The majority of participants (n=380) were females (85.8%). The average age of the participants was 48.74 years (SD = 9.52), with a median age of 43 years (IQR = 25). The mean self-reported financial status score was 5.72 (SD = 1.50), with a median value of 6 (IQR = 2). Digital literacy attainment scored an average of 7.45 (SD = 1.81), with a median value of 8 (IQR = 3). Participants reported using the internet and/or social media for an average of 3.18 hours per day (SD = 2.45), with a median value of 2.5 hours daily (IQR = 13.5). Demographic information is depicted in Table 1.

Table 1. Demographic characteristics of the study sample (n=380).

Characteristics	N	%
Gender		
Males	54	14.2
Females	326	85.8
Age ^a	39.61	12.67
Financial status ^a	5.60	1.45
Digital literacy ^a	7.49	1.90
Daily time in web/social media (hours) ^a	3.00	2.36

^a mean, standard deviation.

3.2. Study scales

The mean HR-OMISS score was 25.07. For health-related behaviors, mean scores were 2.77 for diet, 2.72 for proper use of health care resources, 4.19 for anger and stress, and 1.63 for substance use. Regarding vaccine hesitancy sub-scales, mean score for lack of confidence factor was 4.14 and 3.06 for the risk perception factor. Table 2 summarizes descriptive statistics for all study scales.

Table 2. Descriptive statistics for the study scales (n=380).

Scale	Mean	Standard deviation	Median	Interquartile range
Health-Related Online Misinformation Susceptibility Scale	25.07	8.01	26	12
Health Behavior Inventory – Short Form				
Diet	2.77	1.36	2.33	2
Proper use of health care resources	2.72	1.45	2.33	2.33
Anger and stress	4.19	1.37	4.33	1.67
Substance use	1.63	0.94	1	1.67
Vaccine Hesitancy Scale				
Lack of confidence	4.14	0.69	4.29	1
Risk perception	3.06	0.90	3	1.33

Table 3 shows the correlation coefficients (Pearson’s) between dimensions of online health misinformation susceptibility, health behaviors and vaccine hesitancy. Online health misinformation susceptibility was negatively and significantly associated with all of the health behaviors subscales: diet (r = -0.213, p < 0.01), proper use of health care resources (r = -0.171, p < 0.01), anger/stress (r = -0.370, p < 0.01) and substance use (r = -0.122, p < 0.01). Moreover, higher susceptibility to health misinformation was correlated with a stronger vaccine hesitancy, as measured by both lack of confidence (r = 0.271, p < 0.01) and risk perception (r = 0.314, p < 0.01). These results suggest that greater vulnerability to online health misinformation was associated with poorer health behaviors and stronger vaccine hesitancy.

Table 3. Pearson’s correlation coefficients for the study scales (n=380).

Scale	2	3	4	5	6	7
1. Health-Related Online Misinformation Susceptibility Scale	0.213**	0.171**	0.370**	0.122*	0.271**	0.314**
Health Behavior Inventory – Short Form						
2. Diet		0.306**	0.184**	0.053	0.020	0.010
3. Proper use of health care resources			0.022	0.056*	0.096	0.050
4. Anger and stress				0.154**	0.142**	0.202**
5. Substance use					0.127*	0.230**
Vaccine Hesitancy Scale						
6. Lack of confidence						0.288**
7. Risk perception						

* p-value < 0.05 ** p-value < 0.01.

3.3. Dependent variable: Health behaviors

Univariate and multivariable linear regression analyses to determine the association between online health misinformation susceptibility (HR-OMISS) and health behaviors (HBI-SF) are presented in Table 4. In the adjusted models, higher HR-OMISS scores were associated with significantly higher diet risk (adjusted beta = 0.033; 95% CI 0.016–0.051; p < 0.001), proper use of health care resources risk (adjusted beta = 0.035; 95% CI: 0.016–0.054; p < 0.001), and anger and stress risk (adjusted beta = 0.065; 95% CI: 0.047–0.082; p < 0.001); controlling for gender, age, income status, digital literacy (yes/no), and daily time spent on the web/social media). The correlation between HR-OMISS and substance use was no longer significant in the multivariable model (adjusted beta = 0.010; 95% CI: –0.002 to 0.023; p = 0.096).

Table 4. Linear regression models with score on the Health-Related Online Misinformation Susceptibility Scale as the independent variable and score on the Health Behavior Inventory – Short Form as the dependent variable (n=380).

Dependent variables	Univariate models			Multivariable model ^a		
	Unadjusted coefficient beta	95% CI for beta	P-value	Adjusted coefficient beta	95% CI for beta	P-value
Diet ^b	0.036	0.019 to 0.053	<0.001	0.033	0.016 to 0.051	<0.001
Proper use of health care resources ^c	0.031	0.013 to 0.049	<0.001	0.035	0.016 to 0.054	<0.001
Anger and stress ^d	0.063	0.047 to 0.079	<0.001	0.065	0.047 to 0.082	<0.001
Substance use ^e	0.014	0.003 to 0.026	0.017	0.010	-0.002 to 0.023	0.096

^a Models are adjusted for gender, age, financial status, digital literacy, and daily time in web/social media ^b R² for the final multivariable model = 10.2%; p-value for ANOVA = 0.002; Variance Inflation Factor = 1.149 ^c R² for the final multivariable model = 5.8%; p-value for ANOVA < 0.001; Variance Inflation Factor = 1.149 ^d R² for the final multivariable model = 5.2%; p-value for ANOVA < 0.001; Variance Inflation Factor = 1.149 ^e R² for the final multivariable model = 7.3%; p-value for ANOVA < 0.001; Variance Inflation Factor = 1.149. CI: confidence interval

3.4. Dependent variable: Vaccine hesitancy

Table 5 presents the results of linear regression analyses between HR-OMISS and vaccine hesitancy After adjusting for gender, age, financial situation, digital literacy and daily hours spent on the web/social media, higher HR-OMISS scores were significantly associated with greater lack of confidence in vaccines (adjusted beta = 0.021; 95% CI: 0.012–0.030; $p < 0.001$) and higher concern regarding vaccine safety (adjusted beta = 0.032; 95% CI: 0.022-0.042; $p = 0.001$). The multivariable models accounted for 10.2% of the variance in lack of confidence, and for 18.4% of the variance in risk perception, with reasonable diagnostics for autocorrelation and multicollinearity.

Table 5. Linear regression models with score on the Health-Related Online Misinformation Susceptibility Scale as the independent variable and score on the Vaccine Hesitancy Scale as the dependent variable (n=380).

Dependent variables	Univariate models			Multivariable model ^a		
	Unadjusted coefficient beta	95% CI for beta	P-value	Adjusted coefficient beta	95% CI for beta	P-value
Lack of confidence ^b	0.023	0.015 to 0.032	<0.001	0.021	0.012 to 0.030	<0.001
Risk perception ^c	0.033	0.023 to 0.043	<0.001	0.032	0.022 to 0.042	0.001

^a Models are adjusted for gender, age, financial status, digital literacy, and daily time in web/social media ^b R² for the final multivariable model = 10.2%; p-value for ANOVA < 0.001; Variance Inflation Factor = 1.149 ^c R² for the final multivariable model = 18.4%; p-value for ANOVA < 0.001; Variance Inflation Factor = 1.149 CI: confidence interval.

4. Discussion

4.1. Overall interpretation: Misinformation susceptibility as a cross-cutting determinant of health behaviors and vaccine hesitancy

The present study demonstrated that nurses who showed higher risk for online health-related false information developed poorer health behavior patterns while showing increased vaccine hesitancy through their lower vaccine confidence and greater vaccine safety concerns. The findings indicate that people who have misinformation susceptibility will experience its effects on their decision-making process which involves multiple aspects of their health.

The results confirm the theoretical models which state that vaccine hesitancy stems from multiple factors which depend mainly on confidence-related elements that include people trust in vaccine safety and vaccine effectiveness and healthcare system reliability [4,25,26]. International research shows that healthcare workers vaccination choices depend on their belief about vaccine safety and their trust in health authorities and their understanding of vaccination requirements [19,27,28].

The research findings demonstrate that people who show higher susceptibility to misinformation, experience difficulties in trust establishment and risk assessment and health decision-making processes. Research shows that when people encounter false information multiple times their belief in its truth and their understanding of it increases, even when they already know the information is incorrect [14,29,30].

4.2. Misinformation susceptibility and health behavior domains

The current study results show that people who are highly susceptible to misinformation tend to adopt worse health-related habits which specifically affect their eating habits and their ability to

maintain good health through proper healthful activities. The research results indicate that people's ability to identify fake health information determines their health-related behavior choices which extend beyond their vaccination opinions.

The present findings support previous research which showed that individuals who accept health falsehoods will implement less protective actions and create more dangerous health patterns [17]. Misinformation affects people decision-making because it changes their understanding of how effective preventive measures work while it creates personal health risk perceptions [11,12]. People who lack digital health and health knowledge skills get affected by health misinformation because they cannot assess online health information properly [1,2].

The research showed that nurses who had higher susceptibility to misinformation problems struggled more with stress management and emotional control. The study shows that when people face false health information they develop both mental health problems and destructive ways to deal with their distress [13,18]. The research on cognitive processes demonstrates that people tend to believe false information when they process information through their intuitive and emotional responses instead of using analytical thinking [31].

The current study found no consistent link between misinformation vulnerability and substance use patterns which indicates that substance-related behaviors depend more on psychosocial factors and workplace conditions and organizational structures than on an individual's ability to handle misinformation. The research on public health shows that people use alcohol and develop substance use disorders because their social economic and psychological conditions affect their environmental circumstances and policy frameworks and their psychosocial stress levels [32]. Healthcare professionals demonstrate that psychological factors like resilience and stress management and coping skills determine their health-related behaviors and their patterns of risky behaviors [33,34]. The present study showed that misinformation vulnerability related more to preventive health practices and lifestyle choices than to addictive behavior patterns because of these underlying mechanisms [17].

The research found that people who were more vulnerable to false information showed less appropriate usage of medical services. The pattern suggests that people have less faith in healthcare services which causes them to use non-evidence-based information more often. The research shows that false information can damage public trust in medical facilities which affects their medical treatment choices [1,15,26].

4.3. Misinformation susceptibility and vaccine hesitancy dimensions

Nurses who showed greater susceptibility to misinformation reported decreased vaccine confidence according to the findings of the current research study. Vaccine safety concerns together with vaccine development process trust and regulatory authority trust form the main factors which determine healthcare workers vaccine acceptance according to evidence from the study [7,19]. Misinformation campaigns specifically attack vaccine safety information which results in public uncertainty about vaccination and decreases their trust in immunization [1,15].

Nurses who showed higher tendency to believe false information about vaccines reported greater vaccination risk assessment. The research results show that people who receive false information about vaccines will develop higher vaccine safety concerns while decreasing their belief in disease threat. Research through experiments and behavior studies shows that people who see vaccine misinformation will develop higher vaccine safety concerns which will lead to them wanting to get vaccinated less [12,14,30].

Social standards and medical duties and organizational values of the healthcare workforce determine how vaccination behavior develops within their vaccination practices. Previous studies demonstrated that peer pressure and workplace vaccination culture and perceived professional responsibility function as key factors which determine vaccination choices made by healthcare workers [35–37]. Misinformation exposure may interact with these contextual determinants by reinforcing distrust narratives and increasing uncertainty regarding vaccine safety.

4.4. Implications for practice and future research directions

The current research demonstrates that healthcare education and public health vaccination programs need to implement misinformation resilience strategies as essential components of their training programs. Educational interventions that teach students digital literacy skills together with online information assessment skills and misinformation detection abilities will enable students to better identify harmful health information while increasing their confidence in vaccines [14,31].

of validated tools which assess misinformation susceptibility will enable identification of vulnerable populations who need particular public health interventions [13,17]. The vaccination programs will benefit from systematic monitoring of misinformation exposure together with development of communication strategies which specifically target vaccination-related misinformation.

The research needs to investigate both long-term studies and experimental research to determine how misinformation affects people's health choices and their decision to refuse vaccines. The future research needs to study how digital literacy and institutional trust and information exposure patterns create disparities in health decision-making across different healthcare systems and sociocultural contexts.

4.5. Limitations

The present study is subject to several limitations. First, the use of self-reported instruments to assess misinformation susceptibility, health behaviors, and vaccine hesitancy introduces the possibility of information bias. Although validated tools were utilized, nurses may have provided socially desirable responses, which could result in underestimating susceptibility to misinformation, overstating positive health behaviors, and reporting reduced levels of vaccine hesitancy. Furthermore, the cross-sectional design does not allow for the determination of causal relationships among the variables examined. Additionally, the set of demographic characteristics collected could have been broader, incorporating factors such as participants' occupation, prior exposure to misinformation, and training in detecting misinformation. Future longitudinal research would be valuable for evaluating the potential confounding effects of these variables and strengthening the validity of associations among online health misinformation susceptibility, health behaviors, and vaccine hesitancy. Another limitation concerns the convenience sampling method applied through an online survey, which restricts the generalizability of the findings to the broader population of nurses in Greece. Our sample was not representative, as nurses were predominantly female. Consequently, future studies using random, stratified, and nationally representative samples are needed to strengthen the evidence regarding the associations among the study variables among nurses. Conducting similar research in countries with different cultural contexts would also contribute valuable comparative insights. Previous vaccination behavior represents another important factor that may influence the associations under investigation. Future studies should include prior vaccine behavior as a potential confounder in multivariable analyses to improve the accuracy of these associations. We also required nurses to report at least 30 minutes of daily web or social media use to ensure a minimum level of exposure to online misinformation. However, in the absence of established benchmarks for what constitutes meaningful exposure, this threshold is inherently arbitrary. Future studies employing alternative or multiple exposure criteria may provide deeper insights into misinformation dynamics. Finally, our cross-sectional dataset captures only one point in time and therefore cannot reflect fluctuations or temporal changes in online health misinformation susceptibility, health behaviors, or vaccine hesitancy. Factors such as seasonal trends or weather conditions may influence these variables and warrant consideration in future research.

5. Conclusions

The study results demonstrated that nurses who showed greater online health misinformation susceptibility tended to adopt unhealthy behaviors while developing vaccine hesitancy through

diminished vaccine trust and heightened vaccine safety worries. The research findings demonstrate that people who show vulnerability to misinformation demonstrate cognitive and behavioral deficits which impact their ability to make health-related decisions across different behavioral categories. The research found no consistent relationship between substance use behaviors and addiction-related behaviors which suggests that distinct psychosocial and structural factors drive these two different types of health behaviors.

Nurses who deliver vaccinations and educate patients while they communicate health information to people need digital health literacy training together with misinformation resilience skills which healthcare workers need to acquire for successful health behavior changes and vaccination trust development. The research results show that public health initiatives must combine their informational and cognitive and behavioral health needs which doctors need to study for discovering health information systems and measurement methods that will reduce their exposure to misinformation in their professional work.

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Abbreviations

The following abbreviations are used in this manuscript:

HR-OMISS	Health-Related Online Misinformation Susceptibility Scale
HBI-SF	Health Behavior Inventory–Short Form
VHS	Vaccine Hesitancy Scale
VIF	Variance inflation factor
CI	confidence interval

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