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Investigating the Relationship between the Use of Social Networks and Nutrition Literacy Level among Adults in Mashhad City

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ABSTRACT

Introduction: Digital health, particularly social media, has become a pivotal factor influencing health by enabling widespread information sharing, but it also facilitates the rapid spread of nutritional misinformation that can adversely affect public health. Given the growing importance of nutrition literacy in preventing chronic diseases and the emerging role of social media as a health information source, this study aimed to examine the relationship between social media usage intensity and nutritional literacy among adults in Mashhad City.

Methods: In this cross-sectional study, a multistage cluster sampling technique was employed to recruit 360 adults aged 18–65 years from selected districts of Mashhad between December 2024 and September 2025. Data collection involved demographic variables, self-reported anthropometric measures, and validated questionnaires assessing food literacy, patterns of social media usage, and mobile social media engagement. Social media usage was quantitatively categorized into low, moderate, and high usage groups. Statistical analyses was conducted using SPSS version 21, with a two-tailed significance threshold set at $p < 0.05$.

Results: The mean nutritional literacy score (± SD) was 14.03 (±2.77), and the mean (± SD) social media usage score was 63.71 (±11.58. There was no significant association between social media usage and nutritional literacy neither in the crude (B=-0.009, P-value =0.772) nor the adjusted models (B=-0.01, P-value =0.714). Furthermore, there was no significant association between demographic characteristics and nutritional literacy scores.

Conclusion: Social media usage was not significantly associated with nutritional literacy in adults. Additionally, studies with larger sample sizes and more diverse populations, as well as qualitative assessments of social media content, are needed to better understand this relationship.

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Introduction

Digital health has emerged as a novel, influential factor affecting overall health (1). Social media, as an interactive mobile platform, enables individuals and communities to create, collaborate on, and share user-generated content (2). These platforms allow users to openly express their opinions and share any preferred content (3). This dynamic, however, has a significant downside: it has contributed to the proliferation of nutritional misinformation, often exceeding the availability of reliable information (4, 5). While access to information can be beneficial, it also carries risks, as unverified and unsupported information and opinions can spread rapidly, negatively impacting individuals who engage with such content (5-8).

The capacity to access and disseminate information through digital communication networks, such as the internet and mobile devices, has transformed social actions, including national policies, political campaigns, local policies, activism, and accountability mechanisms (9, 10). Recently, there has been a significant increase in the use of social media platforms—such as blogs, Wikipedia, and various

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social networking sites—by healthcare professionals (11). This adoption underscores the recognized potential of social media as a tool for promoting healthy nutrition and motivating positive health behaviors (12).

This potential must be evaluated against major public health challenges. Considering the rising prevalence of chronic diseases as a critical challenge for healthcare systems worldwide in the twenty-first century, and acknowledging health literacy as a social determinant of well-being, it is essential to promote nutritional literacy (13-15). Adequate nutritional knowledge, optimal dietary behaviors, and maintenance of healthy body weight are currently identified as key modifiable factors for health promotion and chronic disease prevention (16, 17). Health literacy is broadly defined as an individual's knowledge, motivation, and competencies to identify, evaluate, and use health information to make appropriate health-related decisions (18). Two specific types of health literacy—nutrition literacy (NL) and food literacy (FL)—have emerged as integral components in promoting and sustaining healthy dietary practices (19-21). Nutrition literacy is defined as the capacity to obtain, process, and understand nutrition information and skills required for appropriate nutritional decision-making (22-24).

A study investigating the impact of social media on food and nutrition literacy in Italy has been conducted (25). This study examined the influence of social media influencers as an important alternative source of health-related information for adolescents, distinct from parents, physicians, and schools. In this cross-sectional study (N = 509), adolescent health literacy was assessed using the Measurement of Health Literacy Among Adolescents Questionnaire" (MOHLAA-Q), food literacy was measured via the short food literacy questionnaire (SFLQ), and the utilization of social media influencers as sources of information regarding a healthy lifestyle was mapped through self-reported questionnaires. Furthermore, the presence or absence of correlations between the use of social media influencers (SMIs), health literacy, and food literacy was analyzed. The results demonstrated that greater reliance on SMIs as an information source was positively associated with higher levels of both health literacy and food literacy among adolescents.

Consequently, health promoters, including educational institutions and healthcare professionals, should leverage the communication channels favored by adolescents to enhance critical health literacy and food literacy, ultimately improving overall health outcomes. To the best of our knowledge, no analogous study has been conducted in the city of Mashhad. Given the significant role of social networks in influencing adult nutritional literacy and the lack of related research within Mashhad, the present study aims to investigate the relationship between social media usage intensity and nutritional literacy among adults in Mashhad City.

Materials and Methods

The primary objective of this study is to examine the association between social media usage and food literacy levels among adults. Initially, food literacy will be quantitatively assessed using a validated instrument tailored to the Iranian population. Concurrently, participants' social media usage had measured and stratified into three distinct categories: low, moderate, and high usage. Subsequent analyses explored correlations between food literacy scores and social media usage, both across the entire population and within each usage subgroup.

Following sample size determination, eligible adult participants had recruited through a multistage cluster sampling method from diverse districts within Mashhad city. After obtaining informed consent, comprehensive data collection included: (1) demographic information, encompassing age, gender, educational attainment, medical history, and residential location; (2) anthropometric measures, specifically self-reported height and weight; (3) food literacy evaluation via a 35-item questionnaire validated for the Iranian population (26) (Cronbach's alpha coefficient was 0.73); (4) assessment of social network and media usage patterns, types, and trust levels through a validated questionnaire (27) (Cronbach's alpha coefficient was 0.85). The total score range is 19-95, categorized as weak (19-38), moderate (38-57), and high (>57).

The sampling framework involves the following phases (28): (1) defining primary clusters by dividing Mashhad into 13 municipal districts; (2)

randomly selecting four districts (e.g., districts 1, 6, 9, and 12) using a random number table; (3) within each selected district, defining neighborhoods as secondary clusters; (4) random selection of three neighborhoods per district; and (5) systematic random selection of households within each neighborhood using official registries. From each household, one adult aged 18–65 years were randomly selected. Inclusion criteria include age over 18 years, active use of social media, and willingness to participate; exclusion criteria include incomplete questionnaire responses or missing anthropometric data. Data collection conducted in-person and reinforced through announcements at health centers and general clinics within the selected districts.

Sample size calculation was based on a confidence level of 95% (Z = 1.96), an assumed maximum variance (p = 0.5), a design effect of 1.5 to account for clustering, and a margin of error (e) of 0.05. This yielded a required minimum sample size of 360 participants.

$$n=Z2\times p(1-p)\times De2n=e2Z2\times p(1-p)\times D$$

After data collection, the dataset was entered into SPSS version 21. Descriptive statistics were presented as mean ± standard deviation or counts with percentages. The Kolmogorov-Smirnov test was used to assess data normality. Multiple linear regression analysis was conducted to explore predictive relationships. A p-value of less than 0.05 was considered statistically significant.

Results

Study Population Characteristics

A total of 360 participants were included in the analysis, and baseline characteristics are given in Table 1. The mean (SD) age, body weight, and height were 27.57 (±9.49) years, 65.79 (±16.84) kg, and 163.91 (±7.53) cm, respectively. The majority of the participants identified as female (81.9%), were single (77.5%), students (74.4%), and had achieved a bachelor's degree or higher (78.6%). Most participants were non-smokers (93.3%) and reported moderate economic status (76.4%).

Table 1. Descriptive Characteristics of the Study Participants

Quantitative variables	**Mean±SD**
Age (year)	27.57 ± 9.49
Body weight (kg)	65.79±16.84
Height (cm)	163.91±7.53
BMI (kg/m^2)	24.49±6.66
Nutritional literacy score	14.03±2.77
Usage of social network score	63.71±11.58
Qualitative variables	**Percent**
Gender	
Female	81.9
Male	18.1
Marital status	
Single	77.5
Married	22.5
Job	
Housewife	3.3
Employee	6.4
Self-employed	12.8
Student	74.4
Other	3.1
Education	
Under diploma and diploma	21.4
Bachelor or higher degree	78.6
Smoking status	
Yes	6.7
No	93.3
Economic status	
Poor	1.7
Moderate	76.4
Good	21.9

Data presented as mean (SD) or percent.

Comparison of Nutritional Literacy Scores by Demographic Variables

As shown in Table 2, no statistically significant differences were found in nutritional literacy scores across different demographic subgroups. There were no significant differences by sex (male/female) (P-value =0.31), education level (under diploma and diploma, bachelor or higher degree) (P-value =0.80), marital status (single, married) (P-value =0.66), smoking status (yes and no) (P-value =0.09), or job (housewife, employee, self-employed, student, other) (P-value =0.56).

Table 2. Comparison of Nutritional Literacy Scores by Demographic Variables.

Variables	Mean±SD	P-value
Gender		
Female	14.10±2.82	0.31
Male	13.72±2.58	
Marital status		
Single	14.007±3.02	0.66
Married	14.12±1.72	
Education		
Under diploma and diploma	14.09±2.09	0.80
Bachelor or higher degree	14.01±2.94	
Smoking status		
Yes	13.50±1.44	0.09
No	14.07±2.84	
Job		
Housewife	13.08±2.02	0.56
Employee	14.52±1.16	
Self-employed	14.34±1.88	
Student	13.99±3.05	
Other	13.63±1.56	

For two-state variables, the Independent-Samples T Test was used, and for variables with more than two states, ANOVA test was used.

Association between Social Media Usage and Nutritional Literacy

Table 3 presents the association between social media usage and nutritional literacy. In the crude model, no significant association was observed (B=-0.009, 95% CI: -0.07 to 0.05, P-value =0.772). After adjustment for confounding variables such as age, sex, and education level, the association remained non-significant (B=-0.01, 95% CI: -0.07 to 0.05, p=0.714).

Table 3. Association Between Nutritional Literacy and Social Media Usage.

	B (95 CI)	P-value
Crude	-0.009 (-0.07,0.05)	0.772
Adjust	-0.01(-0.07,0.05)	0.714

Model adjusted for age, sex, and education.

Discussion

To the best of our knowledge, the current study is the first to investigate the relationship between the use of social networks and nutrition literacy levels among adults in Iran. Contrary to expectations, given the abundance of health-related content online, our findings revealed no significant association in this population.

The absence of a significant association can be interpreted in light of several key factors. The absence of regulation in social media typically generates an excess of inconsistent dietary information, which may perplex users and negate any potential benefits. Additionally, the way users engage with content may play a vital role. Platforms such as Facebook, Twitter, and Instagram are increasingly used to find recipes, nutritional information, culinary inspiration, and a variety of cooking videos.

Additionally, several studies suggest that using social media can serve as an effective platform for enhancing food literacy and promoting healthier behaviors (29, 30). Our findings showed that this exposure may not necessarily translate into improved nutritional knowledge or literacy. This result is supported by a previous study indicating that nutrition-focused social media content was regarded as a source of inspiration and motivation for adopting healthy eating habits, yet it was not identified as a source of nutritional information or knowledge (31).

The findings present study are aligned with studies that highlight the potential negative or neutral impact of social media on nutritional literacy or nutritional behavior. For instance,

research conducted by Asaduzzaman Khan focusing on adolescents revealed that problematic use of social media is inversely related to the daily consumption of fruits and vegetables. Furthermore, both problematic and excessive use of social media were positively correlated with the daily consumption of sweets and sugary beverages (32). In another study, participants at risk of problematic social media use were more likely to exhibit an unhealthy lifestyle (33). It is important to note that social media continues to pose a significant challenge for health professionals aiming to engage and inform young adults regarding healthy behaviors (34). It seems that young adults are more inclined to follow the health messages of influencers and celebrities instead of those from health professionals (35). This may further elucidate why the utilization of social networks, in the absence of guided or critical engagement with content, is not associated with increased literacy levels. An adequate understanding of nutrition, optimal dietary behaviors, and the maintenance of a healthy weight are now identified as vital adjustable factors in the improvement of health and the prevention of chronic disorders (16, 17).

This study has several notable strengths. It is the first to explore this relationship in the Iranian adult population. Furthermore, while numerous potential confounding variables exist, the study design and statistical analysis aimed to control for the effects of key factors such as age, gender, and educational level, thereby strengthening the internal validity of the results.

Several limitations, including the cross-sectional design, and potential for residual confounding, warrant caution in interpreting these results. Additionally, the sample characteristics — including the high proportion of women and the predominance of undergraduate and university students — may limit the generalizability of the findings to the broader population. The study's setting in one city also means its generalizability to other populations is uncertain. Future longitudinal studies with larger, nationally representative samples are needed to confirm these findings and explore causal pathways.

Conclusion

In summary, the result of the cross-sectional present study showed that using social networks is not related to improvement in nutrition literacy among adults in Mashhad. Therefore, it is recommended that future studies with larger sample sizes and more diverse populations be conducted to further investigate this relationship.

Declarations

Ethical Considerations

This study was approved by the medical ethical committee of Mashhad University of Medical Sciences (ethical code: IR.MUMS.FHMPM.REC.1404.109).

Author Contribution

H.B., Y.A., and N.P. designed research; H.B. and Y.A. conducted research, performed statistical analysis, and wrote the manuscript; N.P. rechecked the analysis and had primary responsibility for final content; and all authors read and approved the final manuscript.

Conflict of Interest

The authors of this article declare that they have no conflict of interest.

Data Availability Statement

The corresponding author will provide datasets upon reasonable request.

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