The Roles of Health Literacy in Influencing the Internet Users' Electronic Word of Mouth: A Socio-Demographic Comparative Study

ABSTRACT

Introduction: People nowadays are casually communicating, preferring the electronic approach basis rather than the conventional one. As a matter of fact, the post Covid-19 has witnessed more people becoming more health conscious, nurturing their protective nature by sharing various types of health information online, beyond the definition of acquaintances. Therefore, this research was conducted to investigate the impacts of health literacy towards electronic word of mouth (e-WOM) among Malaysia internet users in disseminating health information, based on the socio-demographic comparisons.

Methods: This cross-sectional descriptive study involved 400 respondents, with proportionate quota sampling as the sampling technique. 100 samples were approached from each region of Peninsular Malaysia (Central, Southern, Northern and East Coast), who were then given a self-administered questionnaire with 56 items to be filled. This instrument was adapted from a well-established e-WOM questionnaire and New Short-Form Health Literacy Instrument (HLS-SF12).

Findings: The results of multiple regression analyses have shown that the three domains of health literacy have better explained e-WOM (highest R^2 values) among respondents who were male, 41 to 50 years old, with secondary education and self-employed. Nonetheless, more significant influences of health literacy domains towards the dependent variable found among the respondents who were female, 18-30 years old, with bachelor's degree and currently were not working.

Conclusion: There were contradictory results in comparison to the previous studies which were justifiable, since the settings and respondents were not the same. Meanwhile, the government should play its role in shifting society's e-WOM to a positive transmission communication process.

Keywords: Socio-demographic, Electronic word of mouth, Health information, Health literacy

Introduction

The major positive feature of internet is to provide its users in widening spread accessibility of information either as a giver or taker. Its limitless accessibility has enabled the people to share any information at 24/7, granting the privilege of real time support and communication across the boundaries of culture and the globe. With the endless list of 'bless in disguise' aspects, it is a bit debatable in the case of health information sharing in specific. The health information acquired or shared need to be checked and validated before it is further proceeded to the next person due to its major impact on the probability of getting involved in due diligence issues. However, the process of equipping the individuals to critically evaluate the health information has made them to be more resilient to misinformation instead (1). Indirectly, this situation has introduced a new avenue for society to be responsible for any message that they deliver while strengthening the possibility of them becoming more socially engaged. With the said practicality of internet, the power of traditional word of mouth has now transitioned into the dynamic electronic word of mouth (e-WOM) in the sense of how society can now share any health information in real time approach without having to have a face-to-face meeting or a voice call. They can now send any information, either a statement or a question, to the intended audience and feedback can be expected in a second. This delightful experience has initiated more communication through the internet and the well-known social media but the reliability and accuracy of the information shared has caused the controversial debate among the health experts (2).

However, this issue can be combatted by health literacy which can be defined as the ability of an individual to acquire and interpret the information and knowledge that is circumstantially appropriate in maintaining and improving the individual's health (3). The health information was said to be accessible and used by any individual through health literacy which may serve as an obstacle for individuals with limited level (4). Health literacy is comprised of four key components of access, understanding, evaluating and applying health information with the integration of three main domains of health care, disease prevention and health promotion (5). This study will be deliberately

focused on the three domains where firstly started with health care. This domain is highlighting on the individuals' ability to steer the complicated system of healthcare by understanding the health or medical information that they obtained and effectively communicate back to the healthcare professionals. The understanding on the whole technical process and language on the appointment procedures, diagnoses, medical instructions and treatment options will serve as obstacles for someone with low health literacy (6). Meanwhile, the second domain of disease prevention focuses on the individuals' knowledge and skills to prevent injuries and diseases. The concepts of preventive measures, signs and symptoms shall be well understood by individuals so as they will help them to make better informed health related choices and decisions. Health outcomes can be improved through disease prevention as its interventions aim to change the natural history of the disease (7). Lastly, health promotion is the domain that comprehends the understanding of individuals' health longevity by maintaining and improving their general well-being and health. This domain is slightly different to other domains of health literacy, in the sense of the inclusivity of the individuals in a healthy community. The health promotional activities would usually target a bigger capacity of audiences, in the coverage of individuals' awareness on how to have better health. For instance, the optimization of social media usage in health promotion can enable the public health authorities to disseminate targeted health messages to the hard-to-reach individuals while interacting with the public through the dynamic promotional campaigns (8, 9).

With adequate level of health literacy, individuals were expected to be well engaged and participated in any health-related discussions, able to offer comprehensive details to certain medical conditions in the most lament words. This would enable communication to be smoother while trust was no longer an issue for the participants involved. This is because individual's level of health literacy was found to be able to distinguish how the individual may trust any health information sources including the healthcare providers (10). Consequently, this situation has divided the views on word of mouth into two distinguished perspectives where the health messages shared between the parties involved may indicate whether a negative or positive e-WOM has taken place. Though many companies would love to be linked to positive e-WOM by their consumers, studies have unfortunately shown that the consumers are more prone to be persuaded by the messages in negative e-WOM (11). Nonetheless, socio-demographic factors can be the solution for the table to turn positively for both health literacy and e-WOM. Age and gender were the most common socio-demographic factors found to be influencing the two variables of health literacy (12) and e-WOM (13). Therefore, based on the literature review, one main research objective was formulated which entails (1) To compare the impacts of health literacy domains towards e-WOM based on the socio-demographic factors.

Materials and Methods

This descriptive research was correlational study where it was aimed to investigate the influences of health literacy domains (health care, disease prevention and health promotion) towards electronic word of mouth among Malaysia internet users in Peninsular Malaysia. The cross-sectional approach was highlighted in this study as the data was collected in a singular time frame of two months. Besides, a proportionate quota sampling technique was applied for this study as each region of Peninsular Malaysia was represented by 100 samples. Cumulatively, as Peninsular Malaysia comprised of four major regions of Central, Southern, Northern and East Coast, 400 samples were targeted as the respondents. Although the degree of generalizability is questionable in quota sampling, it at least provides adequate statistical power to distinguish the differences in groups due to its character of having oversamples for underrepresented groups (14). In fact, the sample size of 400 respondents was deemed to be appropriate in accordance with the regression analysis minimum requirement of 100 samples (15). These respondents were respectfully approached by the researcher to be voluntarily involved in the study where they were required to answer 56 items self-administered questionnaire. This instrument was disseminated through various platforms for instance, email, Whatsapp, telegram and other social media.

Moreover, the self-administered questionnaire was constructed, adapted from two well established instruments of Electronic Word of Mouth questionnaire (16) and New Short-Form Health Literacy Instrument (HLS-SF12) (17). This instrument has used the four Likert scales of agreement level ranging from strongly agree to strongly disagree; for all its items except for the demographic questions. A quantitative research expert has validated this questionnaire's content validity before it

was submitted for ethical review. Later, this questionnaire was approved by the ethical committee, recognizing that the researcher is paying attention to the issue of privacy and integrity of the collected data. Besides, a pilot study of 50 samples was conducted prior to actual data collection, verifying the reliability of the instrument. It has demonstrated good reliability with good Cronbach's Alpha values, ranging from 0.798 to 0.90 (18). Statistical Package for the Social Sciences (SPSS) version 29.0 was used by the researcher to assist in data analysis for descriptive and multiple regression analyses to make sure the achievement of the respective research objective.

Findings

Though this research was conveniently reaching out its potential respondents, approximately three months were taken to collect 450 responses including the pilot study data as some regions may demonstrate stronger challenges, for instance the northern region which required almost two months to have complete 100 responses. Nevertheless, the practicality of google forms has conveniently assisted the researcher, especially with the 'required' features that has enabled the researchers to have zero missing responses. This has consequently aided the researcher collecting the required responses within a decent time frame. This study has dominantly involved females of 68.5%, individuals aged 18 to 30 years old with 77.5%. Individuals with bachelor's degree were mainly involved (52.5%) and most of them were not working (59.5%). This segmentation of profiles was expected by the researcher as individuals aged 20 to 39 years old were the ones with the highest usage of internet with 99.6% (19). This category was commonly known to be represented by individuals with bachelor's degrees where they were expected to have difficulties in securing jobs, especially during the first year after graduation.

In achieving the main research objective, multiple regression analyses were conducted in which the results were summarized in Table 1 till Table 4 according to the socio-demographic comparisons. The analyses involved three health literacy domains as the independent variables and e-WOM as the dependent variable. Table 1 demonstrated the findings of health literacy effects on e-WOM based on gender comparisons. Findings have seen higher R^2 value in males rather than females which has indicated males' e-WOM was better explained by the three domains of health literacy. Nevertheless, it can also be seen in the findings that disease prevention and health care domains had significantly influenced e-WOM among female internet users, while in contrast health promotion served as the only domain of health literacy to be significantly influenced the e-WOM of male internet users (See Table 1).

Table 1. Multiple Regression Analysis between Health Literacy and e-WOM: Gender Comparisons

Gender	Variables	Value(s)
Male	Health care	.173
	Disease prevention	.178
	Health promotion	.406*
	R^2	.505*
	F	41.434
	Sig. F Value	<.001
Female	Health care	.214*
	Disease prevention	.279*
	Health promotion	.118
	R^2	.314*
	F	41.290
	Sig. F Value	<.001
*Significant at 0.05		

Table 2 reported the findings of health literacy effects on e-WOM based on age comparisons. Results have seen that 18-30 years old and 41-50 years old age categories were the only categories with significant R^2 value. These can be interpreted as the health literacy of individuals aged 41-50 years

old or 18-30 years old can explain 54.1% or 41% of their electronic word of mouth. Plus, all three domains of health literacy were found to be significantly predicting the e-WOM among individuals in this age category with health care as the strongest predictor, followed by disease prevention and health promotion (See Table 2).

Table 2. Multiple Regression Analysis between Health Literacy and e-WOM: Age Comparisons

Age	Variables	Value(s)
18-30 years old	Health care	.270*
	Disease prevention	.265*
	Health promotion	.160*
	R^2	.410*
	F	70.902
	Sig. F Value	<.001
31-40 years old	Health care	-.082
	Disease prevention	.175
	Health promotion	.174
	R^2	.072
	F	1.239
	Sig. F Value	.306
41-50 years old	Health care	.250
	Disease prevention	.197
	Health promotion	.334
	R^2	.541*
	F	10.234
	Sig. F Value	<.001
51-60 years old	Health care	.115
	Disease prevention	-.552
	Health promotion	1.209
	R^2	3.489
	F	41.434
	Sig. F Value	.129

*Significant at 0.05

Table 3 summarized the findings of health literacy effects on e-WOM based on the highest education comparisons. Results have shown that every education category has significant R^2 value. These findings have indicated how the health literacy of individuals with secondary education, postgraduate studies, diploma or bachelor's degree can respectively explain 60.2%, 42.5%, 40.8% and 27.5% respectively of their e-WOM. Despite the highest R^2 value for secondary education, the health care domain was found to be the only predictor for e-WOM while bachelor's degree has seen two domains with significant beta values, indicating two predictors for the dependent variable. In specific, disease prevention was found to be the strongest predictor of e-WOM, followed by health promotion. Bachelor's degree was the only category with two significant predictors as compared to secondary education and diploma which both demonstrated health care domain as the sole predictor (See Table 3).

Table 3. Multiple Regression Analysis between Health Literacy and e-WOM: Education Comparisons

Education	Variables	Value(s)
Secondary Education	Health care	.724*
	Disease prevention	-.017
	Health promotion	.079
	R^2	.602*
	F	20.667

Education	Variables	Value(s)
	Sig. F Value	<.001
Diploma	Health care	.303*
	Disease prevention	.144
	Health promotion	.243
	R^2	.408*
	F	27.066
	Sig. F Value	<.001
Bachelor's Degree	Health care	.080
	Disease prevention	.250*
	Health promotion	.238*
	R^2	.275*
	F	26.007
	Sig. F Value	<.001
Postgraduate Studies	Health care	.058
	Disease prevention	.431
	Health promotion	.212
	R^2	.425*
	F	4.675
	Sig. F Value	.013

*Significant at 0.05

Lastly, Table 4 showed the findings of health literacy effects on e-WOM based on occupation comparisons. Findings have shown that every occupation category has significant R^2 value. Therefore, it can be interpreted that health literacy of individuals who are self-employed can explain 68.8% of e-WOM, while the health literacy of those who are not working, worked in private or public sectors can explain 39.2%, 27% or 17.1% respectively of their electronic word of mouth. Though the self-employed category was seen as having a higher R^2 value, it was found that the e-WOM can only be predicted by a single domain of health care. In the meantime, the electronic word of mouth among individuals who are not working was found to be predicted by disease prevention and health care domains. Plus, E-WOM for both public and private sectors workers was found to not be significantly predicted by any of the health literacy domains (See Table 4).

Table 4. Multiple Regression Analysis between Health Literacy and e-WOM: Occupation Comparisons

Education	Variables	Value(s)
Public Sector	Health care	-.037
	Disease prevention	.146
	Health promotion	.331
	R^2	.171*
	F	3.304
	Sig. F Value	.028
Private Sector	Health care	.077
	Disease prevention	.296
	Health promotion	.180
	R^2	.270*
	F	9.490
	Sig. F Value	<.001
Self-Employed	Health care	.626*
	Disease prevention	.068
	Health promotion	.156
	R^2	.688*
	F	18.378
	Sig. F Value	<.001
Not working	Health care	.246*
	Disease prevention	.259*
	Health promotion	.176

R²	.392*
F	50.324
Sig. F Value	<.001

*Significant at 0.05

Discussion

This research has compared the impacts of health literacy towards e-WOM based on the socio-demographic factors of gender, age, highest education and occupations among the internet users in Peninsular Malaysia. Most of the findings found were aligned with past research that indicated a closer gap in the literature review. The results from the multiple regression analyses demonstrated more significant predicting effects of health literacy domains towards the dependent variable found among the respondents who were female, 18-30 years old, with bachelor's degree and currently were not working. Firstly, in the comparisons of gender, it was reported in previous research that females have higher usage of health forums and blogs in searching health information online (20). In fact, women were known to have stronger traits of conscientiousness and agreeableness, which consequently inclining them to be more complied with preventive health behaviors (21), explaining the reason behind why the disease prevention domain is the strongest predictor of their e-WOM. In regard to male, despite of study has addressed the underdevelopment of males' health literacy (22), they were commonly found to be poor health literate which has negatively influenced their help seeking behaviour and engagement to healthcare professionals (23). Second, in the comparisons of age, despite of individuals aged 41-50 years old were found to be who with the highest percentage of ICT usage to seek for health information (72%), it was also reported that individuals aged 20 to 39 years old were the ones with the highest usage of internet with 99.6% (19). These young individuals may not be fond of seeking health information, but they were reported with higher levels of health literacy (24). Their good health literacy level may serve as a view projection that they do not have to look for health information as they know better what is revolving with their health and surrounding. Young adults are usually underrepresented as they are not targeted for health promotional activities, who tend to be overlooked by the authorities for their significance in having societal relevance (25). However, as they grow older, their health literacy will significantly decline (24) and that is when good health seeking behavior including seeking health information online comes into place.

Thirdly, in the comparisons of highest education among the respondents, it was reported that e-WOM of those with bachelor's degrees can be better predicted by two out of three domains of health literacy as compared to other education attainments. It was previously stated in multiple past studies how educational background can influence an individual's level of health literacy (12, 24, 26). Though this study has found a quite similar finding on the predicting effects among the bachelor's degree, the postgraduate studies category has indicated otherwise. It was found that e-WOM can be significantly explained by the health literacy domains but there was no single predictor among them. Inductively, this finding can be considered as new information for health literacy body of knowledge as postgraduate students were known to have higher health literacy level than average (27, 28). Besides, study has also found the positive relationship between educational level and health promotional behaviour whereby the lower the education level, the lower the health promotional behaviour (29). Simply, by having a more excellent level of health literacy, it can be projected how their electronic word of mouth may possibly be influenced by how they are being literate in comprehending and sharing the health information. Lastly, in the comparisons of respondents' occupations, it was reported that there were better significant predicting effects of health literacy domains towards the dependent variable among those who were not working. Contrary, this finding was not aligned with previous research that found employed individuals tend to seek more health information online as compared to the unemployed (30). Nevertheless, this contradictory finding may occur due to the fact that these individuals who are not working have more time to use the internet and do social networking through social media (31). Subsequently, there will be a significant increase in internet usage among these individuals, looking for health information especially on disease prevention. This is particularly important as unemployed individuals will not take the risk of getting sick as the situation will incur medical costs on top of their usual living costs (32).

Though there are limited studies that have compared the integration between the two variables of health literacy and electronic word of mouth, but many studies have been conducted on the effects of socio-demographic factors towards health literacy (12, 26, 33). Regardless, it is vital to

acknowledge that Malaysians health literacy was not fully leveraged by the government to ensure the reliability and accuracy of the disseminated health information. This evident allegation was apparent especially during Covid-19 pandemic where the situation of 'infodemic' was getting more critical as rumors on health information disorder have spread rapidly (34). Accordingly, the Malaysian Communications and Multimedia Commission (MCMC) has tried to resolve the issue by encouraging the citizens to visit the official website '*Sebenarnya*' to verify the news factuality (35). If the Malaysians can fully utilize their good health literacy in segregating good and bad health information during the information dissemination, this would help the government to lead to a more positive health outcomes (36). Furthermore, the significance of health literacy is prioritized by the Malaysia government as it is highlighted in the Healthy Malaysia National Agenda (ANMS) 2020-2030 which put into place the National Health Literacy Policy (DLKK) in 2024. The agenda was aimed to empower the Malaysians to be responsible for their health-related decision making by adopting a healthier lifestyle (37). Regardless of the socio-demographic factors, the government shall take advantage of the significance of health literacy in shifting society's e-WOM to a positive transmission process. Hence, this study is recommending the Malaysia government specifically the public health authorities to consistently empower the society and public on the importance of using social media to share reliable and accurate health information. This suggestion is in line with the DLKK, specifically the 9th initiative which emphasized the significance of community support in strengthening the health literacy capacities of the community (37). This initiative has highlighted the importance of organizing community empowerment activities, aligned with the strength of health literacy which may empower the public to be in charge of their own health related decision makings. Nonetheless, this empowerment initiative is particularly irrelevant without a strong basis on health literacy. This is due to the fact that social media users may be distracted by the peripheral information from processing the intended health messages (38), consequently creating problems for those with low health literacy. On the other hand, future studies were recommended to do a comparative study based on the household income as one of the variables as it is one of the most influential factors of health literacy. Future researchers may also apply probability sampling techniques, for instance proportionate stratified random sampling to avoid the occurrences of sampling bias in selecting the targeted respondents.

Conclusions

In a nutshell, this study has achieved its main research objective in investigating the impacts of health literacy towards the electronic word of mouth among Malaysia internet users by comparing the socio-demographic factors. Gender, age, highest education and occupation were the socio-demographic factors that were being compared in accordance with previous studies findings, indicating that they are the most commonly found influential factors of health literacy. The results from the multiple regression analyses have found that the three domains of health literacy have better explained e-WOM (highest R^2 values) among respondents who were male, 41 to 50 years old, with secondary education and self-employed. Nonetheless, more significant predicting effects of health literacy domains towards the dependent variable found among the respondents who were female, 18-30 years old, with bachelor's degree and currently were not working.