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ORIGINAL ARTICLE IN SOCIAL MEDIA HEALTHCARE INFORMATION

The mediating effects of satisfaction and attitude on consumers' intent toward adoption of social media healthcare information

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Abstract

Introduction: Social media's (SM) popularity among consumers has grown over the years. Yet, consumers' perceptions and actions toward accepting health information from social media platforms are not clear. Consumers' acceptance of social media healthcare information in Ghana was investigated using the Unified Theory of Acceptance and Use of Technology (UTAUT) model. This study integrated the UTAUT model with satisfaction and attitude.

Method: An online survey was conducted by employing a convenience sampling method. An online link containing the questionnaire was sent to participants through social media platforms, and out of the data received, 200 responses were used for this study. The data obtained was analyzed using SmartPLS Structural Equation Modeling (SEM) version 3.0.

Results: Behavior intention (BI) to use social media for healthcare information was significantly predicted by performance expectancy (PE), social influence (SI), and attitude (ATT) with ($P < 0.005$). ATT mediated the relationship between PE and BI as well as PE and SAT, which explains 83.6% of the variance in consumers' intention to accept social media healthcare information. ATT had a significant influence on consumers' use behavior (UB) with satisfaction as the mediator, which explains 68.8% variance in the use behavior of consumers. Likewise, the

explaining power of ATT and SAT were 40.1% and 66.6%, respectively. Consumers' intention to utilize social media for healthcare purposes was influenced by PE, SI, and ATT, while SAT, and ATT had a significant impact on UB among Ghanaian consumers.

Conclusion: Therefore, the outcome offers health providers and professionals in developing countries the avenue to learn about consumers' perceptions and reactions before introducing social media healthcare broadcasts.

Keywords: Attitude; healthcare information; satisfaction; social media; UTAUT model

TAKE-HOME MESSAGE: Social media penetration in the healthcare sector is advancing, and healthcare consumers have shown great interest. As a result, healthcare providers need to take advantage to educate health seekers.

Competing interests: none declared

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INTRODUCTION

The internet presents an increased repository for information search and dissemination. Consumers and organizations access information, connect and collaborate in new ways through

the use of the internet [1]. The internet has paved the new way for social media (SM) communication and connection trends. The evasion of social media platforms has changed the dynamics of internet interaction, especially how we disseminate and seek information daily. Social media utilization has increased in the past few years, and there are many platforms available for consumers. The information and interaction on social media provide ways to communicate with community members [2]. Social media has various features which make its use fun for consumers. Information usually found on social media includes politics, economics, social, relationships, health, etc.

Social media platforms have become a significant forum for disseminating health-related information since the emergence of digital media technology [3]. In terms of healthcare promotion, social media plays an important role [2]. Social media and the amount of health information available on the internet are modifying the health information system [4]. Social Media has been used in the healthcare sector to sustain or enhance peer-to-peer and clinician-to-patient contact, to facilitate institutional branding, and improve the pace of interaction between and through various healthcare stakeholders [1]. Social media is being used effectively by health organizations to extend their scope, promote engagement, and expand access to reliable, science-based health messages [5]. Many people use social media to access medical information all over the world, and it is thought that health information has the effect of increasing the scope and range of conversation and interaction among members [1]. Health information is one of the most common topics, which has increased the health information-seeking behavior of consumers [6]. Health information-seeking behavior (HISB) refers to the instances in which people seek knowledge about their wellbeing, threats, diseases, and wellness [7, 8]. Health issues and their

effect on consumer behavior have advanced over the years [9]. These platforms have valuable health information [6, 10] and serve as an avenue to increase and facilitate translational clinical interaction strategies and successful data dissemination in ways that allow users to use and generate and exchange relevant health information [2]. Today, healthcare information seeking behavior has a greater impact on consumers' behavior intent and overall information use. This study adopted some constructs from the Unified Theory of Acceptance and Use of Technology (UTAUT) model and introduced satisfaction and attitude as mediators.

The UTAUT model was developed with the primary focus on behavior intention and the usage of information technologies [11]. The four main determining factors are performance expectancy (PE), the degree to which an individual assumes that using the system will assist him or her in achieving job advancements, effort expectancy (EE), the degree of ease linked with using a device or technology. Social influence (SI), the degree to which a person believes to be important thinks an individual can use a new system, and facilitating conditions (FC), the degree to which a person believes that an organizational and technological infrastructure exists to facilitate system use. The model has four moderators, namely gender, age, experience, and voluntariness of use [11]. Many studies have been conducted using the UTAUT model [11–15], and the results have shown that PE, EE, and SI are predictors for behavior intention [11, 14, 16]. Other studies reveal that PE impacts consumers' attitudes and the same has a significant effect on satisfaction [17, 18]. Consumer satisfaction is explained as a person's overall impression of a product after purchasing it [19]. Sawyer et al [20] assert that consumer satisfaction is defined as exceeding customer service or product expectations. Attitude is the opinion of an objective, an idea, or an act to endorse or oppose something [21]. Studies have shown that a person's attitude predicts

behavior [22, 23]. The aim of this study was to investigate how performance expectancy and social influence can affect social media health information usage, and the mediating role of consumers' satisfaction and attitude.

METHODS

Study design and procedure

This study adopted a convenience sampling approach and used a quantitative research method. The questionnaire for the study was circulated through social media platforms which indicated the aim of the study. Respondents were people who reside in the Accra metropolis. The sample for the survey was geared towards those who own smart devices and utilize one or more social media platforms. A total of 200 responses from participants were utilized for the analysis. According to the literature [24, 25], a sample size of 200 is deemed appropriate when using structural equation modeling (SEM) for analysis. As a result, the sample size met the suggestion, and it is fair to gain results after analysis.

Study instruments and measures

In this study, PE and SI were independent constructs; BI and UB were dependent constructs. Satisfaction and attitude were the mediating constructs.

Constructs from the UTAUT model, satisfaction and attitude

The study adopted some questionnaires from the UTAUT model [11], consumer satisfaction [26] and attitude [27]. From the UTAUT model, 21 questions were used, including satisfaction 4, and attitude 6. The questionnaire was grouped into two parts, and the first part dealt with the demographic information while the second contained the closed-ended questions from the

UTAUT model, consumers' attitude and satisfaction. Some of the sample questions were modified to fit this study's needs, while others were added to help enhance the research. Experts verified the questions, and they went through pre-testing, after which changes were made. Participants were asked about their gender, age, and marital status in the demographic part, and the second part asked about respondents' intention to accept social media for healthcare information. A 5-point Likert scale, which ranged from 'strongly disagree' (1) to 'strongly agree' (5), were used.

Data analysis

The validity and reliability of the data were tested, and the connection among the hypothesized constructs was checked with partial least squares (PLS) based on its estimations and statistical power [28]. The survey data was exported from Microsoft Office form to Microsoft Excel for primary statistical analysis. Out of the 32 items proposed for the study, 23 items were valid for the analysis. The data collected was analyzed using SmartPLS 3 structural equation modeling (SEM) and Statistical Package for the Social Sciences (SPSS). The results were examined by means of the PLS algorithm, bootstrapping, and blindfolding from SmartPLS, while the descriptive statistics were analyzed using SPSS software (Table 1).

RESULTS

The study results show that more than half (72%) of the respondents were male, and less than half (25%) were female. From the results, the majority of the participants (68%) were between the ages of 15-25, 24.5% were between the ages of 26-35, and 7.5% were above 35 years old. As for marital status, most of the respondents (90%) were single, and a few (10%) were married.

Table 1. Socio-demographic results (*n* = 200).

Demographics	Frequency	Percentage %
Gender		
Male	150	75
Female	50	25
Age		
15-25	136	68
26-35	49	24.5
36 and above	15	7.5
Marital status		
Single	180	90
Married	20	10

Measurement model

The validity and reliability analyses were conducted to check the measurement model. Validity was examined using the factor loadings and average variance extracted (AVE). The factor loadings were between 0.643 and 0.894, and AVE values exceeded 0.50. The reliability was assessed using Cronbach alpha and composite reliability. As shown in Table 2, all the Cronbach alpha and Composite reliability values were above 0.7. The results show that there is adequate internal consistency [29]. Discriminant validity was tested using the HTMT, and the values were less than 1.

Table 2. Measurement model results.

Constructs		**Convergent validity**		**Internal Consistency Reliability**		**Discriminant Validity**
	Notation	Items loading	AVE	Cronbach's Alpha	CR	HTMT – confidence Interval less than 1
ATT	ATT1	0.767				
	ATT2	0.817				
	ATT3	0.865	0.601	0.900	0.900	Yes
	ATT4	0.791				
	ATT5	0.728				
	ATT6	0.666				
BI	BI2	0.743				
	BI4	0.799	0.535	0.769	0.774	Yes
	BI5	0.643				
PE	PE2	0.667				
	PE3	0.743	0.521	0.768	0.765	Yes
	PE4	0.752				
SAT	SAT1	0.651				
	SAT2	0.753	0.577	0.845	0.845	Yes
	SAT3	0.894				
	SAT4	0.720				
SI	SI5	0.812				
	SI7	0.709	0.581	0.731	0.734	Yes
UB	UB1	0.839				

UB2	0.831	0.679	0.893	0.894	Yes
UB3	0.875				
UB4	0.744				

Note: PE: performance expectancy, SI: social influence, ATT: attitude, BI: behavior intention, SAT: satisfaction, UB: use behavior

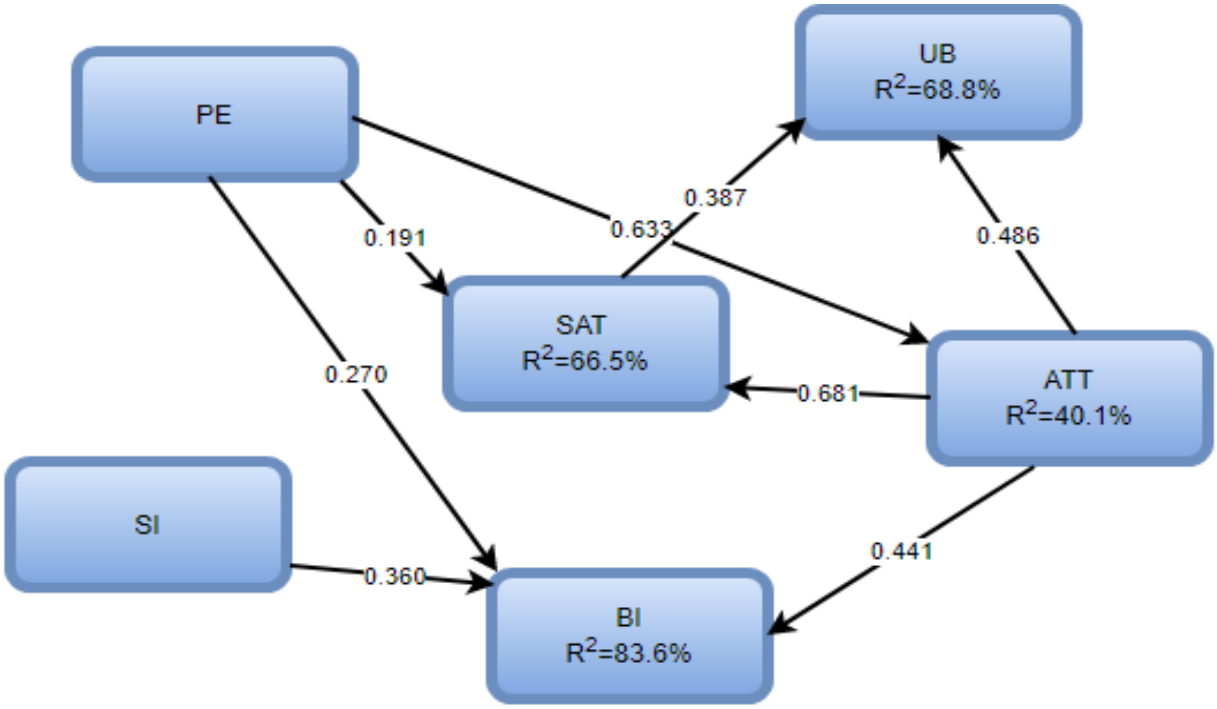

Figure 1. Results of the measurement model.

Structural model

The results in Table 3 present the outcome of the proposed hypotheses for this study, and all hypotheses were supported.

H_1: Performance expectancy has a positive significance on consumers' attitudes toward using social media for healthcare information.

As shown in Table 3, the results reveal that PE has a statistically significant relationship with ATT (β = .633, t-value = 9.281, $P < .000$).

H_2: Performance expectancy has a positive association with consumers' satisfaction with

adopting social media healthcare information.

The results in Table 3 indicate that PE has a positive effect with SAT (β = .191, t-value = 2.087, $P < .037$).

H_3: Performance expectancy has a significant impact on consumer behavior intention to use social media for healthcare purposes.

Table 3 shows that PE has a statistically significant relationship with BI (β = .270, t-value = 2.912, $P < .004$).

H_4: Social influence has a significant impact on the behavior intention of consumers to accept social media healthcare information

Regarding H_4, it shows in Table 3 that SI has a positive relationship with BI (β = .360, t-value = 3.377, $P < .001$).

H_5: Satisfaction relates positively with UB and mediates the relationship between consumer attitude and use behavior.

As indicated in Table 3 SAT has a positive relationship with UB (β = .387, t-value =2.384, $P < .017$) and that it partially mediates the relationship between attitude and use behavior (Table 5).

H_6: Attitude has a significant effect on BI and mediates the relationship between PE and BI of consumers' social media healthcare information adoption.

The results in Table 3 indicate that ATT has a positive relationship with BI (β = .441, t-value = 4.129, $P < .000$) and Table 5 shows that ATT also partially mediates the relationship between PE and BI.

H_7: The attitude has a positive impact on consumers' satisfaction and mediates the relationship between PE and SAT.

As indicted in Table 3, has a significant effect on SAT (β = .681, t-value = 8.481, $P < .000$), and partially mediates the relationship between PE and SAT (Table 5).

H_8: Consumers' attitudes toward social media healthcare information adoption are associated positively with consumers' use behavior. Attitude relates positively with UB (β = .486, t-value = 3.177, $P < .002$) and this is presented in Table 3.

Table 3. Results of hypothesis testing.

Hypothesis	Path	Path Coefficient	T Statistics	P-Values	Remarks	VIF	f^2
H1	PE -> ATT	.633	9.281	.000	Supported	1.000	0.670
H2	PE -> SAT	.191	2.087	.037	Supported	1.670	0.065
H3	PE -> BI	.270	2.912	.004	Supported	1.905	0.234
H4	SI -> BI	.360	3.377	.001	Supported	1.652	0.478
H5	SAT -> UB	.387	2.384	.017	Supported	2.806	0.171
H6	ATT -> BI	.441	4.129	.000	Supported	1.835	0.646
H7	ATT -> SAT	.681	8.481	.000	Supported	1.670	0.831
H8	ATT -> UB	.486	3.177	.002	Supported	2.806	0.270

Abbreviations: PE: performance expectancy, SI: social influence, ATT: attitude, BI: behavior intention, SAT: satisfaction, UB: use behavior

Coefficient of determination and cross validated redundancy

The values of the R^2 were 0.401 for ATT, 0.836 for BI, 0.665 for SAT, and 0.688 for UB. The R^2 values showed moderate and substantial predictability of the constructs according to Chin [30]. The Q^2 values were greater than 0, which means the values had a predictive relevance [31, 32]. Table 4 presents the model fit, and the results show that SRMR was lower than the 0.08 and the indices higher than the suggested thresholds [33, 34]. We assessed the multicollinearity

based on variance inflation factors (VIF) and the values were < 5, which indicates that there are no multicollinearity issues. The size effect of f^2 was also checked and the values were between . 065 and .831 (Table 3).

Table 4. Coefficient of determination and cross-validated redundancy.

	Coefficient of determination		**Cross validated redundancy**
Construct	R^2	R^2 Adjusted	Q^2
ATT	0.401	0.398	0.180
BI	0.836	0.834	0.396
SAT	0.665	0.662	0.342
UB	0.688	0.685	0.427
Model fit			
Overall model fit, SRMR 0.069, d_ULS-1.219, d_G-0.532, Chi-Square – 520.679, NFI 0.822			

Abbreviations: ATT: attitude, BI: behavior intention, SAT: satisfaction, UB: use behavior

Mediation results

As shown in Table 5, the mediating effect was conducted on the exogenous constructs to assess how the variables affect endogenous constructs. According to Bontis et al [35], mediation takes effect when a variable serves as an intermediate between two variables. From Table 5, the direct effect of attitude on use behavior was (t-value = 3.177, $P < .002$) and the indirect effect was (t-value = 2.183, $P < .029$). Also, the direct effect of PE on BI was (t-value = 2.912, $P < .004$) while the indirect effect was (t-value = 3.666, $P < .000$). The direct effect of PE on SAT indicates (t-value = 2.087, $P < .037$) whiles the indirect effect shows (t-value = 5.763, $P < .000$). From the above report, SAT partially mediates the relationship between ATT and UB. Similarly, ATT partially mediated the relationship between PE and SAT as well as PE and BI.

Table 5. Mediation results.

Constructs	Direct Effect	T-stat	P-value	Indirect Effect	T-stat	P-value	Direct Effect Sign	Indirect Effect Sign	Conclusion
ATT->UB	.486	3.177	.002	.264	2.183	.029	Yes	Yes	Partial Mediation
PE->BI	.270	2.912	.004	.279	3.666	.000	Yes	Yes	Partial Mediation
PE->SAT	.191	2.087	.037	.432	5.763	.000	Yes	Yes	Partial Mediation

Note: ATT: attitude, BI: behavior intention, PE: performance expectancy, SI: social influence, SAT: satisfaction.

DISCUSSION

This study investigated consumer intent to adopt social media healthcare information. By integrating SAT and ATT with some constructs of the UTAUT model, the model explained 83.8% of the variance in BI and 68.8% of the variance in UB of consumers' willingness to accept social media healthcare information. The study's outcome indicated that PE, SI, and ATT significantly affected BI, and they supported the study's hypotheses. The findings are consistent with the previous UTAUT studies [36–40]. ATT was found to be the higher predictor of BI, which SI and PE followed. The reason might be that consumer perception of social media would increase their attitude to embracing healthcare information. Also, if consumers find the social media platforms perform the established task, this will encourage consumers to accept them for

health information. Again, it is assumed that the recommendation of friends will have a great impact on consumers' interest in adopting social media for health-related issues. Suppose they believe that such a recommendation is based on the benefit the friend is getting from the platform; in that case, it will encourage consumers to utilize the platform and connect with healthcare professionals and service providers.

Again, PE and ATT had a positive relationship with SAT, while ATT was the higher determinant of SAT. The outcome supported our hypotheses, and these were consistent with previous scholars [17, 41, 42] who used PE and SAT in their studies. The outcome indicates that the platform's satisfaction gain will likely motivate consumers to adopt healthcare information on social media. We found that SAT and ATT had a positive effect on UB, and ATT was the most critical predictor of UB. These also supported the hypotheses for our study, and they were in line with the studies of some scholars [37, 43]. The results demonstrate that if consumers are open-minded and approach social media with a positive attitude, it will impact their satisfaction level, which will lead to their utilization in the long term. With a positive attitude and consumer satisfaction, it is obvious that consumers will be willing to utilize healthcare information on social media.

Our study findings reveal the mediating effect of ATT as it positively affected the relationship between PE and SAT and BI. These, too, supported our hypotheses, and they are consistent with the work of Bervell et al [44], which found that attitude mediated the relationship between PE and BI. SAT mediated the relationship between ATT and BI, supporting the study's hypothesis. This implies that as customers become more comfortable with the system, their behaviors can change, profoundly impacting their ability to use social media for health information. This study

provided evidence for consumers' intent and use behavior to accept social media health information. It is evident that when consumers find social media with health information, they will be more willing to accept it and connect with health providers.

With the practical implications, the outcome of this study would benefit healthcare providers and professionals. The results show that consumers must be satisfied with the platform healthcare providers use. The information healthcare givers provide for consumers must be relevant to enable them to embrace social media healthcare information. This will guide healthcare managers to provide vital health information that will meet the needs of consumers. Healthcare providers and professionals are recommended to promote their platforms to alert consumers about how important it is to connect with caregivers and healthcare professionals on social media. The results will enable healthcare providers to develop different dynamics to attract new consumers such as families and friends. Healthcare providers can adopt strategic approaches to encourage consumers to have a positive attitude towards accepting social media healthcare. Healthcare providers should consistently update health information and frequently interact with consumers to gather feedback on their services. Lastly, healthcare policymakers can use this study to have a directive on how social media healthcare information should be presented and the ethical procedure that healthcare providers must follow in the digital environment.

The findings of our study offer various theoretical implications. This study with the Ghanaian sample was consistent with other studies in technological acceptance using the UTAUT model. Also, this research goes a step further to integrating some constructs of the UTAUT model with satisfaction and attitude to explore how consumers perceive social media healthcare information. Other studies have used the UTAUT model and the integrated variables separately: the UTAUT

model with satisfaction [45, 46] and the UTAUT model with attitude [37, 38]. This study also changed the paths: First, PE, SI, and ATT were the determinants of BI, while PE and ATT predicted SAT and ATT. Again, SAT and ATT were the determinants of UB. In the current study, ATT was found to be a better predictor of BI and UB. The findings demonstrate the importance of integrating the two variables into the UTAUT model to learn about consumers' intention and use behavior to toward social media healthcare.

CONCLUSION

Our study used some constructs of the UTAUT model with consumers' satisfaction and attitude to investigate consumers' behavior intention to utilize social media for healthcare information. The outcome of this study shows consumers' willingness to accept healthcare information on social media platforms. The findings supported all eight hypotheses: PE has a significant positive effect on SAT, ATT, and BI. ATT had a positive association with SAT, BI, and UB, while SAT had a significant relationship with UB. Both ATT and SAT were partial mediators that exerted impacts on BI and UB. This study specified that the integrated variables improve the model’s explained variance of behavioral intention by 83.6% and use behavior with 68.8% of consumers’ willingness to adopt social media healthcare information. The results provide empirical input to understand consumer behavior regarding the willingness to utilize social media healthcare information among Ghanaians. Per our findings, healthcare practitioners and experts should enhance their social media abilities so that they can better grasp how the platforms function and engage customers for a better result. This study’s results will enrich the literature on social media healthcare and bring awareness to other research in developing countries.

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