

Original Article

E-cigarette Purchase Intention through Facebook Social Media: A Cross-Sectional Study

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Abstract: Online shopping is a growing phenomenon and social media namely Facebook has radically changed consumers online purchase behaviour; especially the interactive information system of consumers, peers, and vendors. Similar to other online purchasing products or services, e-cigarette marketing in Facebook has potential. This study aims to determine the association between individual's online interaction and e-cigarette purchase intention from Facebook vape groups. A cross-sectional study was conducted among 214 respondents using the Facebook platform from September to December 2019. Data were collected via a self-administered questionnaire. The Chi-square test was used for data analyses using SPSS (version 25.0). Most of the participants were male; the mean age of the respondents was 27.41 ± 2.1 . Total 93.9% (201 of 214) and 56.1% (120 of 214) respondents were vaper and smoker respectively. Among the non-smokers, most of the respondents were vaper (84 of 94, 89.4%). Consumers smoking and vaping status were associated with each other ($\chi^2 = 6.11$, $P=0.01$). There was an association between vaping status and purchase intention of e-cigarettes from the Facebook vape group ($\chi^2 = 5.06$, $P=0.02$). Online interactions, namely like ($\chi^2 = 5.88$, $P < 0.01$), post ($\chi^2 = 7.16$, $P < 0.01$) and sharing ($\chi^2 = 10.14$, $P < 0.01$) of the e-cigarette related information or advertisements in social media were associated with purchase intention of e-cigarettes from Facebook vape group. This study revealed individuals vaping and online interactions were associated with an online purchase the intention of e-cigarette in Facebook. Public health researchers and policymakers might contemplate the regulatory environment of online marketing of e-cigarettes to curtail the uptake of e-cigarettes among non-smokers.

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1. Introduction

Vaping (use of e-cigarette) vaporizes e-liquid (with or without nicotine) to mimic conventional smoking [1]. It can assist with quit smoking for adult smokers [2], however, there are mixed opinions that it may be a gateway to cigarette smoking among non-smokers [3]. Some studies also shown evidence of simultaneous use of traditional cigarette and e-cigarette [4,5]. Additionally, studies increasingly show that e-cigarettes emit harmful substances and may expose users to chemicals and toxins such as formaldehyde or heavy metals which have potential adverse health effects [6,7].

At present, there is no clear international consensus on the appropriate regulation of the use of electronic cigarettes (e-cigarettes), with jurisdictions adopting a range of regulatory responses to this product [8-10]. Furthermore, the sales and marketing of e-cigarettes (both offline and online) has been targeting young people with their trendy features and pull them towards addiction to nicotine [11]. Even, a recent review mentioned that

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individuals may uptake or intend to vape by observation of vaping by peers, friends, family members or celebrities on social media [12]. Apart from imitation of peers vaping features, there is lack of evidence about influence to purchase e-cigarettes by peers' recommendations in social media.

Undeniably, social media, primarily Facebook, has attracted a considerable amount of attention in recent years in social network marketing which has impacted marketing communication considerably [13]. Under this innovative marketing approach, brands and consumers are connected without any limitation in time, location and means of communication as the approach facilitates a two-way communication instead of the traditional one-way communication. Evidence suggests that peer interactions in social media influences consumer's online purchase intention behaviour [13].

Online purchase intention occurs when an individual plan to buy a particular product or service in the future through any website or social networking channels via internet [14-16]. According to the Theory of Reasoned Action, consumer behavior could be predicted from its corresponding intentions [17]. Evidence shows that online interactions influence consumers purchase intention [18]. Therefore, it is very crucial to understand the consumer's online purchase intention of e-cigarettes from social media channels. Moreover, evidence suggest that e-cigarette users accessed e-cigarette information and advertising on social media platforms [19]; but there is lack of evidence about the impact of online interaction among peers to purchase e-cigarettes in social media. Thus, the current study aims to determine the association between individual's tobacco consumption status and online interaction in social media with e-cigarette purchase intention from Facebook vape groups.

2. Materials and Methods

The present study used a cross-sectional survey to assess e-cigarette purchase intention from social networking vape groups in Facebook. Recruitment of the participants were done from various Facebook vape groups [20]; we performed convenient and snowball sampling strategy to recruit minimum 200 participants. The participants must be age of 18 years and member of any Facebook vape groups were included.

The survey was sent to the members of several Facebook vape groups via a link invitation requesting participation. Participants who voluntarily agreed to participate in the study, could fill the online survey via Google form. By submission of this form, informed consent for this study was achieved from the participants digitally. Data was collected from September 2019 to December 2019. Ethical guidelines of Declaration of Helsinki IV were followed, and permission of conduction of this research obtained from the appropriate authority of a university board. Survey data was stored on a password-protected computer.

Data was collected using a self-administered questionnaire which was developed by an extensive review of literature and discussed among the research team to ensure relevance of each item and content validity. Prior to data collection, the survey was pilot tested in a sample with similar characteristics (excluded from the main analysis) to determine the usability of the online response system, language clarity and timing of questions.

There is total of 15 items in the questionnaire consisting of sociodemographic characteristic (country of origin, age and gender), tobacco consumption status (smoking, vaping and quit intention), online interaction in social media (social media activity such as like, share and/or post e-cigarette related information or advertisements in Facebook vape group), subjective norm, perceived enjoyment, economic benefit, trust and risk towards online purchase intention of e-cigarettes from Facebook vape groups.

Regarding the individuals tobacco consumption status, the sample was stratified for the following comparisons: (1) respondents who had never smoked cigarettes (non-smoker) compared with those who had smoked cigarettes (smoker); (2) respondents who had never used e-cigarettes (non-vaper) compared with those who had used e-cigarettes

(vaper); and (3) respondents who didn't want to quit smoking or vaping (non-quitter) compared with those who wanted to quit smoking or vaping (quitter).

Data was analysed using IBM Statistical Package for Social Science (SPSS) version 25.0 comprising descriptive and bivariate analysis. Descriptive statistics was used to describe characteristics of the respondents. Bivariate analysis of Chi-Square (χ^2) was used to measure associations between two categorical variables and recorded as frequency (n) and percentages (%). The p value of <0.05 was considered statistically significant. We have followed STROBE (STrengthening the Reporting of OBservational studies in Epidemiology) guideline for reporting [21].

3. Results

This A total of 267 participants were responded to the survey questionnaire. After exclusion of missing data, only 214 competed (response rate 80%) the full questionnaire which were included in the main analysis. There were 14 different nationalities responded in the survey, but majority of the participants were from Bangladesh (198 of 214, 92%). Most of the participants were male (209 of 214, 97.7%); and age below 30 years (168 of 209, 78.5%). The mean age of the respondents was 27.41 ± 2.1 and ranged from 21 to 49 years old.

Regarding consumer's subjective norm, total 30.4% (65 of 214) agreed about friends' endorsement of buying e-cigarette from Facebook vape group seller. When compared with disagreement, only 25.3% (54 of 214), 32.3% (69 of 214), 25.7% (55 of 214) and 23.4% (50 of 214) of the participants agreed on perceived enjoyment, economic benefit, trust, and risk measures respectively. Distribution of consumer's responses regarding these measures had been reported in [Table 1](#).

Table 1. Distribution of participants responses (N=214)

	Disagree N (%)	Neutral N (%)	Agree N (%)
Consumer's Subjective Norm			
Most of my friends think that buying e-cigarette through the Facebook seller is a good idea.	92(43.0)	57 (26.6)	65(30.4)
Consumer's Perceived Enjoyment			
I will enjoy vaping if I buy form this face group page	76(35.5)	84 (39.2)	54(25.3)
Consumer's Perceived Economical Benefit			
Purchased e-cigarette from this Facebook group will save some money	74(34.5)	71 (33.2)	69(32.3)
Consumer's Perceived Trust			
E-cigarette purchased by using Facebook will be trust-worthy	74(34.5)	85 (39.8)	55(25.7)
Consumer's Perceived Risk			
Online purchased e-cigarette is not as good as expected	76(35.5)	88(41.1)	50 (23.4)

Regarding the tobacco consumption status of the individuals, majority of the respondents were smoker (120 of 214, 56.1%), vaper (201 of 214, 93.9%) and willing to quit either smoking or vaping (180 of 214, 84.1%). Among the non-smokers, majority of the respondents were vaper (84 of 94, 89.4%). Total 97.5% (117 of 120) respondents were both smoking and vaping concomitantly. Moreover, majority of the respondents mentioned affirmative responses for like (140 of 214, 65.4%), post (115 of 214, 53.7%) and share (153 of 214, 71.5 %) e-cigarette related information or advertisement in the Facebook vape

groups. Overall, total 53.3% (114 of 214) respondents' intent to purchase e-cigarette from Facebook vape groups.

Consumers smoking and vaping status were associated with each other, which was revealed by Chi square ($\chi^2 = 6.11$, $P=0.01$). Additionally, based on Chi square analysis (Table 2), there was an association between vaping status and consumers purchase intention of e-cigarettes from Facebook vape group ($\chi^2 = 5.06$, $P=0.02$). But smoking ($\chi^2 = 0.72$, $P=0.39$) and quitting ($\chi^2 = 2.37$, $P=0.12$) status were not associated with consumers purchase intention of e-cigarettes from Facebook vape groups (Table 2).

Table 2. Association between tobacco consumption status and online purchase intention (N=214)

		Purchase Intention		χ^2	p-value
		Yes N (%)	No N (%)		
Smoking status	Smoker	67 (55.8)	53 (44.2)	0.72	0.39
	Non-smoker	47 (50.1)	47 (50.1)		
Vaping status	Vaper	111 (55.2)	90 (44.8)	5.06	0.02*
	Non vaper	3 (23.1)	10 (76.9)		
Quit status	Quitter	100 (55.6)	80 (44.4)	2.37	0.12
	Non quitter	14 (41.2)	20 (58.8)		

*Significant at level $p<0.05$

Chi square test also revealed that online interaction namely like ($\chi^2 = 5.88$, $P < 0.01$), post ($\chi^2 = 7.16$, $P < 0.01$) and sharing ($\chi^2 = 10.14$, $P < 0.01$) of the e-cigarette related information or advertisements in social media were associated with consumers purchase intention of e-cigarettes from Facebook vape groups (Table 3).

Table 3. Association between online interaction in social media and purchase intention (N=214)

		Purchase Intention		χ^2	p-value
		Yes N (%)	No N (%)		
Like	Yes	83 (59.3)	57 (40.7)	5.88	<0.01*
	No	31 (41.9)	43 (58.1)		
Post	Yes	71 (61.7)	44 (38.3)	7.16	<0.00*
	No	43 (43.4)	56 (56.6)		
Share	Yes	92 (60.1)	61 (39.9)	10.14	<0.00*
	No	22 (36.1)	39 (63.9)		

*Significant at level $p<0.05$

4. Discussion

Authors This study revealed that majority of the respondents were smokers and vapers. Among the non-smokers, majority of them were vaper which is an alarming issue. The results also showed that individuals vaping status and online interactions were associated with e-cigarette purchase intention from Facebook vape groups. Individuals smoking and quitting status were not associated with consumers purchase intention of e-cigarettes may implied the debate on use of e-cigarettes as a quit smoking tool. Overall, half of the total respondents were intended to purchase e-cigarette from Facebook vape groups. The findings of this research indicate that the extant literature may not adequately explain factors that either discourage or encourage consumers when buying e-cigarettes online in the social media context where this study might add a definite merit.

Though e-cigarettes were designed to support quit smoking [2], but prior studies suggested the uptake of e-cigarettes among non-smokers [3] or dual use of vaping and smoking [4,5] which aligned with the findings of our current study. Even a recent study also mentioned that even never e-cigarette users searched information about e-cigarettes in the social media [19]. Our study also revealed the association between vaping status and consumers purchase intention of e-cigarettes from Facebook vape group; but individuals' smoking or quitting status were not associated. Thus, to avert smoking and endorse e-cigarette as a quit smoking aid, the policymakers might apprehend the marketing strategies of e-cigarettes in social media.

In our study, when compared with disagreement, overall, one third of the sample population agreed friends' endorsement, perceived enjoyment, economic benefit, trust and risk measures of purchase intention of e-cigarettes from Facebook vape group seller. These factors were also considered for online purchase of other products like clothing materials [22]; food and beverage [23]; wine [17], from various social media sites [16,18,24,25] namely Facebook [26] and Instagram [27,28]. Furthermore, half of the respondents of our study intended to purchase e-cigarette from Facebook vape group which congruent with previous evidence of consumers online purchase intention in various social media platforms [26,28].

Social media become an integral part of our lifestyle; it creates the opportunities for sharing information via online communications; especially social interaction is the key instigator. Evidence suggested that social interactions via comment, like or sharing of the social media posts by a peer affects purchase intentions of the consumers [29,30]. Our study finding had similar result, online interaction about e-cigarette related information or advertisements in social media were associated with consumers purchase intention of e-cigarettes from Facebook vape groups. Evidence also suggested that peer communications provoked purchasing decisions which might lead to the astonishing growth of e-commerce [24]. Like other technologies, social media can facilitate social change and changes in vaping practices; therefore, further research may be useful to understand whether online marketing of e-cigarettes target non-smokers or non-vapers.

This study involved getting information about consumers purchase intention of e-cigarettes from social media platform. The target respondents were familiar with the Facebook and use this social media in their routine life. Although data from an online survey may not be as precise as behavioural observation, but the key strengths of an online self-administered survey are mainly cost, accuracy and convenience. Therefore, the major strength of this study was the data collections method via online self-administered questionnaire from Facebook vape groups.

This study also attempted to expand the understanding of factors influencing purchase intention of e-cigarettes from social media platform. Although the endeavour was worthwhile, it was not without its limitations. There was the possible problem of self-reporting and multi-responses in this study, it is possible that results were biased toward customers who were willing to join this survey. The data obtained could raise the question of external validity. This limitation did not minimize the significance of the results or findings in this study. The above point was mentioned to direct the attention of future research identifying and aiding further improvement in this area.

In today's technologically advanced era, the intention to buy online is affected by both technology factors and socio-cultural factors. This study explored both factors namely the online interaction culture and individual's tobacco consumption influence on e-cigarette purchase intention from social media. Findings of this research will provide insight to the public health research and e-commerce managers about the consumers online purchase intentions of e-cigarettes in social media context. Additionally, the policy makers might induce regulatory strategies of the online marketing of e-cigarettes to mitigate the uptake of e-cigarettes among the non-smokers which is the most crucial concern.

As the available bandwidth for communication increases, it is expected to lead to a greater use of the technology in the everyday lives. Future studies should incorporate additional technology factors as well as income, education, content of the e-cigarettes specially e-liquid containing nicotine. A longitudinal study could be designed to understand consumers behaviour regarding purchase intention of e-cigarettes in social media which may change over time.

5. Conclusions

This study found that consumers tend to purchase e-cigarettes from Facebook vape groups due to online interactions. Public health researchers, policy makers and e-Marketing managers must find the right formula with the right marketing mix concerning use of e-cigarettes for quit smoking tool, not as a trendy product among the non-smokers which might be high protentional to be addicted if contain nicotine.

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