The Communication of Health Knowledge in Social Media under the Special Chinese Culture Context: the Moderating Effect of Loss of Face

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Abstract: The communication of health knowledge in social media plays an important role in public health literacy and health behavior promotion. But with the accumulation of user-generated health information in social media, more and more misleading health information, health gossip and health rumors are inhibiting the communication of health knowledge and breaking the balance of information ecology in social media. This study focuses on the information ecology in social media and contributes to the communication of health knowledge in social media ecology, highlighting the characteristics of health knowledge and the special Chinese culture. A communication explanatory framework was constructed and 319 samples were tested leveraging PLS. The results indicate that fear communication and trust communication both act as effective communication forms contributing to the communication of health knowledge; face communication acts as a barrier constraining the trust communication while no effect on fear communication.

Keywords: Health Knowledge Communication; Fear Communication; Trust Communication; Face Communication; Loss of Face;

1. Introduction

social media is increasingly being used as powerful tools in conducting health education and improving health literacy, and bring a new dimension to health care, with a series of health knowledge communicated among hospitals, health organizations, governments, companies and users (Moorhead et al, 2013; Karlsen et al, 2012). But, unlike traditional health knowledge communication controlled by authoritative organizations, this user-generated health knowledge is more prone to result in misleading information, some of which is no more than rumors or gossip, inhibiting the communication of real health knowledge and breaking the balance of information ecology in social media. For example, rumors about the H1N1 virus in Japan and the H7N9 virus in China both lead to widespread trust crises with authorities (Barrelet et al, 2013; Shigemura et al, 2015). The 2013 rumor about the hepatitis B vaccine resulted in a serious public health crisis. Misleading information and rumors, such as "Milk causes cancer," "Calcium supplements can cause kidney stones," "GM foods kill your grandchildren," "Red wine can prevent heart disease," have permeated social media and confused users who seek health truths (Liu, 2014; Chua & Banerjee, 2015), sometimes ignited digital wildfires and changed users' cognition and trust in the knowledge (Difonzo, 2013). Particularly, the breakout of the weizexi event, the student weizexi, who suffered synovial sarcoma, retrieved the Second Hospital of Beijing Armed Police Corps on Baidu search engine and died in medical fraud, which has show the seriousness of unbalance information ecology in social media. Only the real knowledge is communicated and users have enough knowledge to resist the rumors, will the information ecology return back to balance.

Aiming to promote the communication of health knowledge in social media in special Chinese culture context and return the information ecology back to balance, this study attempts to reveal and define three communication forms, namely fear communication, trust communication and face communication, taken full consideration about the prior studies, social media context, knowledge characters and special Chinese cultures, to examine their relationships with the health knowledge communication and their interactions, and tries to construct a health knowledge communication model in social media to make a better explanation about the communication of health knowledge and make more suggestions for the health education and health communication.

2. Theoretical Background and Hypothesis Development

2.1 Fear Communication

Fear has long been used in persuasive message to motivate people to perform adaptive behavior (Boss et al, 2015). As proposed in fear appeal theories, persuasive messages that warn of personal threats arouse fear by highlighting the potential danger if message recipients do not adopt the messages' recommendations (Dillard et al, 1996). The major tenet of fear theories is that individuals will take measures to protect themselves as long as they perceive potential danger, which regard fear as a stimulate to arouse individuals' attitudes and behaviors change to cope with this stimulate and weaken potential danger. If the response efficacy and the self-efficacy are too low to cope with the danger, recipients will choose to ignore this stimulate and escape from the fear (i.e., the message will backfire).

Unlike fear appeal emphasizing the adaptive behavior, fear communication emphasizes fear aroused by potential danger running throughout the whole communication—fear is communicated between the senders and recipients and recipients need not to evaluate the response efficacy and self-efficacy and to cope with and weaken the potential dangers, namely fear communication is free from the backfire, although prior studies defined it as fear-arousing communication (Hoog et al, 2007). Fear can drive individuals to communicate with each other and result in the fear communication rather than coping with the fear. Such as the public fear communication about vaccination programs, and the widespread fear is more likely to motivate counter-productive behaviors and irrational behaviors due to the misperceived risks and benefits related to the flu vaccine (May, 2005). Fear communication performs not only in the audio-visual media, but also the in olfaction media (De Groot et al, 2014). Whatever you see and smell, fear communication exists everywhere. Fear is an emotional response to the potential threat and harm, so that fear communication can also be regarded as an emotion communication, namely fear emotion.

In the context of health knowledge, the content producer usually shows the vivid disease symptoms or infected results via the scary pictures and written information to highlight the potential risk and danger, which is very easily to motivate users' fear response to the health knowledge and transmit the fear to friends accompanying with the communication of health knowledge. Therefore, we propose the following hypothesis:

H1: Fear has a positive effect on health knowledge communication

In the fear communication process, perceived severity and perceived vulnerability both play a dominant role in the process of fear motivation. Perceived severity emphasizes the belief in the extent of harm that can result from the acquired disease or harmful state as a result of a particular behavior, it's an estimate made by the individual that reflects the cost in terms of medical and social consequence (Kasmaei et al, 2014), which means different people may have different judgments about severity—although facing the same harmful states, such as male adolescents in Nepal have rather a high level of perceived severity and a low level of perceived vulnerability toward sexual behavior and AIDS than the female adolescents (Tamang et al, 2001), women are associated with lower perceived severity of cardiac disease than the men (Nau et al, 2005), and girls perceived more severity of school bullying than boys although boys experienced more frequent bullying (Chen et al, 2015). As illustrated in the prior studies, perceived severity usually plays a role as an essential part of threat appraisal and a strong predictor of fear arousing the fear emotion to response to the potential dangers

(Boss et al, 2015). In the case of health knowledge communication, the high level of severity perception, that users perceived from the written knowledge or the pictures embedded in the health knowledge, the more fear responses to the health knowledge incurred. Thus, we propose the following:

H2: Perceived severity has a positive effect on fear

Perceived vulnerability emphasizes the belief in the probability and the likelihood that potential risk come out although sometimes it's also called perceived susceptibility from the patient perspective in some researches (Em et al, 2006). Due to the various species of diseases and unhealthy behaviors, namely different levels of occurrence probability, the individuals usually have different responses to the information about the diseases, preventions and cures et al. Over and above, the personal risk status perception, the motivations to drive the un-health, the difference of racial and gender, and the social network variables all have impacts on the perception of vulnerability (Wild & Cunningham, 2001). As proposed in prior studies, perceived vulnerability is a proximal antecedent to lead to a fear emotional response in the process of emotion control (Hong, 2011). In the context of health knowledge in social media, individuals may show different levels of fear response toward the same health knowledge, limited to the personal cognition discrepancies and fear thresholds. Thus, we propose the following:

H3: Perceived vulnerability has a positive effect on fear

2.2 Trust Communication

Trust has long been regarded as a catalyst for transaction and relationship in such diverse areas as marketing, finance, information system, business administration, economic, communication, psychology and sociology (Schoorman et al, 2007). It is an essential for understanding interpersonal behavior and economic exchange (Pavlou, 2003). In organizations and groups, trust has also become an important intangible asset as a foundation of cooperation and communication. Trust means not only the interpersonal relationships, but also the attitude to people and object, which implies that trust can also be defined as an subjective evaluation about whether the object or the person is worthwhile or not. As prior researchers defined, trust was a willingness to take risk and would lead to risk taking in a relationship—the higher level trust, the more risk that one is willing to take (McEvily et al, 2003). In the context of communication, trust both means that the relationship between the senders and recipients is trustworthy, such as adolescents are prone to select a person who trust to communicate—which further reform the attachment security because communication influence trust in turn (Pace et al, 2011), and that the information and knowledge flowing between the senders and recipients is credible and believable, namely the communicated object is trustworthy. In this study, we pay more attention to the subjective evaluation about the objects in the communication because the friendships have been constructed in WeChat, and define the process to communicate trustworthy objects with each others as trust communication—where people communicate the things that they trust with their friends and attempt to make their friend as well as to trust the things. Thus, we propose the following hypothesis:

H4: Trust has a positive effect on health knowledge communication

Perceived knowledge quality is defined as a subjective evaluation and perception pertaining to the knowledge, which emphasizes the substructure dynamics of knowledge quality, unlike the knowledge quality is regarded as an objective attribute of knowledge, which means the quality about the knowledge will not change along with the context and subjects' preferences (Dong, 2014). According to the sense making theory, perceived knowledge quality should be divided into perceived intrinsic knowledge quality, perceived contextual knowledge quality and perceived actionable knowledge quality (Kyoon, 2014), and perceived knowledge quality has greater relevance to contextual knowledge quality (Dong et al, 2011). Especially in the context of health knowledge, perceived intrinsic knowledge quality, perceived contextual knowledge quality and perceived actionable knowledge quality, may be three key evaluation dimensions about the health knowledge, due to the vital role and strict limitation about health knowledge. Therefore, we construct the perceived knowledge quality with these three dimensions to examine the relationship between

perceived knowledge quality and trust, and suppose that higher level of perceived knowledge quality contribute to the individuals' trust in health knowledge, as following:

H5: Perceived knowledge quality has a positive effect on trust

Perceived source credibility refers to the perception about the source of information and knowledge, namely whether the source is expert and trustworthy (Tormala et al, 2006). In the context of health knowledge, perceived source credibility sometimes may have a stronger effect on the attitude when recipients are in low level of health literacy, in particular under the pressure of health risk and limited time (Chou et al, 2015). For instance, health messages and knowledge provided by the physician may be easier to be trusted and communicated in contrast to the minister (Lesa & Renita, 2012). Similarly, people may are prone to have an eye on the health knowledge promulgated on the hospital official websites and bulletins than the knowledge promulgated on the small wall advertising, Therefore, we propose the following hypothesis based on the construction of perceived source credibility consisting of perceived provider credibility and perceived platform credibility in social media.

H6: Perceived source credibility has a positive effect on trust

2.3 Face Communication

Face is of Chinese origin and notes in a Chinese linguistic context, which refers to a sense of favorable social self-worth that a person wants others to have of him or her in a relational and network context (Ho, 1976; Bao et al, 2003). As Ho(1976) suggested, face is associated with the social status the person earned in a social network, a gain of face means a gain of status. Based on this concept of face, loss of face, saving face, enhancing face and face consciousness et al, a series of face conceptions are supposed and get extensive examinations. Face is a universal concern but is particularly salient in the Chinese culture, and has been regarded as a key and dominant interpersonal dynamic in Asian social relations (Sue & Morishima, 1982). Face communication emphasizes the function of face in the process of communication. For instance, in the synchronous computer-mediated communication, the chat-medium have a more effective communication and more successful task resolution than the video call, due to the anonymity of the chat-medium which concerns less loss of face versus much loss of face in the video call (Zwaard & Bannink, 2014). Under the fear of loss of face, men are more reluctant to report sexual harassment than women in Korea—although men are also harassed by women colleagues and students (Cheong et al, 2013). Face communication can be regarded as a communication that is greater relevant to the face, namely people may reduce their communication due to the worry about loss of face, or enhance their communication for gaining face and enhancing face. In a word, face consciousness runs throughout the communication. In this paper, we focus on the loss of face in the face communication, because for the face consciousness, the potential risk may exceed the benefit to communicate the health knowledge due to varieties of misleading health information and health rumors.

Unlike fear communication and trust communication, face communication is driven by personal intrinsic subconscious characters depending on the personal sensitivity and consciousness about loss of face, which means it function on health knowledge communication via other variables and result in a cross-form communication. In other words, in the context of social media, people who are in the process of fear communication may also get impacts from the loss of face to restrain their fear communication, result in a fear—face cross communication, people who are in the process of trust communication may also get impacts from the loss of face to restrain their trust communication, result in a trust—face cross communication. Therefore, we propose the following hypotheses:

H7(a): Higher levels of loss of face lead to weaker influences of fear on health knowledge communication.

H7(b): Higher levels of loss of face lead to weaker influences of trust on health knowledge communication.

Based on the theoretical background and hypotheses development mentioned above, we attempt to define three communication forms about health knowledge in social media—fear communication, trust communication and face communication, and examine their functions and interaction functions

on health knowledge communication in social media separately. The overall research framework is shown in Figure 1.
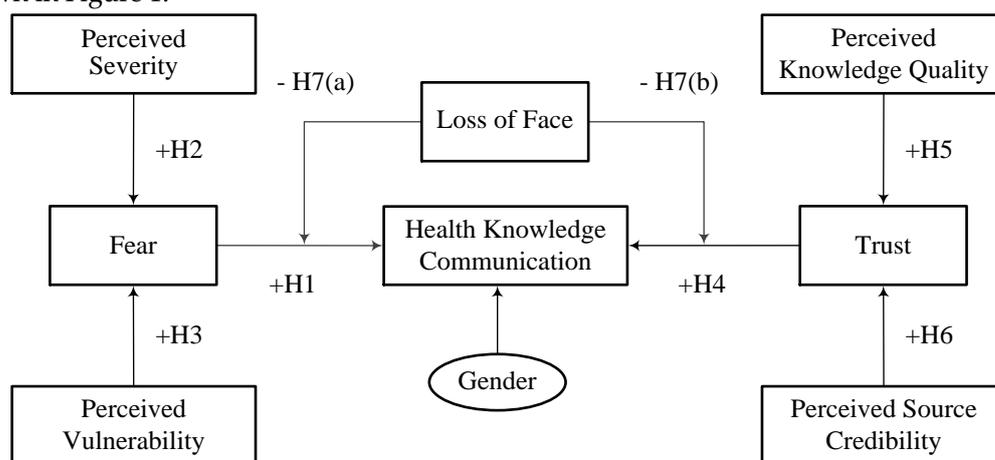

Fig.1 Health Knowledge Communication Research Model

3. Research Methodology

### 3.1 Measurement Development

Following the above analysis, eight constructs were constructed in the conceptual research model. To ensure the validity of the scale, most items used to measure the constructs are adapted from the existing literatures on a seven-Likert scale, from strongly disagree to strongly agree. Three items regarding health knowledge communication are referred to Napper et al (2014); Three items on fear are adapted from Boss et al (2015); Three items on perceived severity are referred to Boss et al (2015); Three items on perceived vulnerability are referred to Tyc et al (2006); Three items on trust are adapted from Cazier et al (2007) and Neveen & Arik (2008); Six items on perceived knowledge quality are referred to Lee et al (2008) and Citrin (2001); Four items on perceived source credibility are adapted from Chou et al (2015); Four items on loss of face are referred to Zane & Yeh (2002) and Mak et al (2008).

3.2 Data Collection and Descriptive Analysis

We called participants sampled randomly in WeChat. To ensure the data quality of the questionnaire, the participants participate in the research only with regard to WeChat. Naturally, the participant will get some bills as a reward for their time and energy through WeChat Red Envelopes until their questionnaires are checked by hand. After 25 days' collection, we get 385 responses and 329 effective ones after filtering, excluding the few time-paid questionnaires that fell far below the mean time and incomplete questionnaires. The valid rate is 85.5%. Table 1 displays the demographic information in detail.

Table 1 Demographics of the research sample

Characteristics	Range	Number		Percentage(%)
Gender	Male	132		40.1
	Female	197		59.9
Age	18 below	3		0.9
	18~25	201		61.1
	26~30	103		31.3
	31~40	15		4.6
	41~50	6		1.8
	50 above	1		0.3
Income level	1000 below	131		39.8
	1000~3000	79		24.0
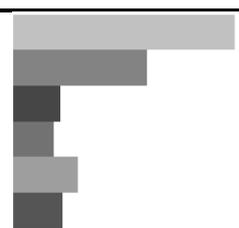
3001~5000	28		8.5
5001~7000	24		7.3
7001~10000	38		11.6
10000 above	29		8.8

4 Measurement Model

4.1 Reliability and Convergent Validity Analysis

Reliability refers to the internal consistency of items constituting constructs and can be estimated using composite reliability and Cronbach's alpha. As shown in Table 3, all item loadings are above the desired level, 0.7, and all the Cronbach's alphas of the constructs exceed 0.8. Meanwhile, CR and AVE both exceed the desired level. Therefore, both reliability and convergent validity are supported.

Table 3 Scale properties

Variables	Items	Loadings	Cronbach's alphas	CR	AVE
Perceived Severity	PES1	0.967	0.968	0.9791	0.9398
	PES2	0.979			
	PES3	0.963			
Perceived Vulnerability	PEV1	0.952	0.9352	0.9586	0.8854
	PEV2	0.924			
	PEV3	0.947			
Fear	FEA1	0944	0.9526	0.9694	0.9134
	FEA2	0.955			
	FEA3	0.968			
Perceived Knowledge Quality	PKQ1	0.844	0.9292	0.9441	0.7383
	PKQ2	0.896			
	PKQ3	0.848			
	PKQ4	0.788			
	PKQ5	0.879			
	PKQ6	0.895			
Perceived Source Credibility	PSC1	0.914	0.9301	0.9503	0.8271
	PSC2	0.868			
	PSC3	0.920			
	PSC4	0.936			
Trust	TRU1	0.966	0.9588	0.9733	0.9238
	TRU2	0.957			
	TRU3	0.961			
Loss of Face	LOF1	0.777	0.751	0.8567	0.6662
	LOF2	0.834			
	LOF3	0.837			
	LOF4	0.754			
Health Knowledge Communication	HKC1	0.969	0.9596	0.9738	0.9252
	HKC2	0.957			
	HKC3	0.960			

4.2 Discriminant Validity Analysis

Discriminant validity indicates the extent to which a given latent variable is different from other latent variables. If the square root of AVE is greater than the correlation between that construct and

all other constructs, the discriminant validity of the measurements is satisfactory (Fornell and Larcker, 1981). Table 4 displays the correlation matrix of the constructs and the square roots of their AVE values (presented on the diagonal). The results imply that every construct has higher correlation with itself, indicating satisfactory discriminant validity.

Table 4 Correlations between constructs

	PES	PEV	FEA	PKQ	PSC	TRU	LOF	HKC
PES	**0.9694**							
PEV	0.4609	**0.9410**						
FEA	0.3729	0.3432	**0.9557**					
PKQ	0.4718	0.3488	0.2309	**0.8592**				
PSC	0.3648	0.2865	0.1613	0.6195	**0.9095**			
TRU	0.4300	0.2692	0.1831	0.6459	0.6676	**0.9611**		
LOF	0.3644	0.1866	0.2023	0.1983	0.1624	0.1738	**0.8162**	
HKC	0.3292	0.2363	0.2341	0.5626	0.5361	0.5682	0.1334	**0.9619**

Note: The diagonal is the square root of AVE for each construct

4.3 Common Method Bias

As with all self-reported data, there is a potential for common method biases resulting from multiple sources such as consistency motif and social desirability (Podsakoff et al, 2003). Following Podsakoff and organ (1986), a Harmon one-factor test was conducted in our theoretical model. Results showed that seven factors are present and the most covariance explained by one factor is 37.23%, with no single factor accounting for the majority of the covariance among the measures, which indicating that common method biases are not likely a contaminant of our results.

5. Results

5.1 Testing of the Structure Model

After establishing the validity of the measures, we test the structural paths in the research model. Test details are shown in Figure 3. As expected, in the first communication form of health knowledge—fear communication, there are a significant positive relationship between fear and health knowledge communication (β=0.135, p<0.01), and positive relationships between fear and perceived severity (β=0.273, p<0.001) and perceived vulnerability (β=0.218, p<0.001). As such, H1, H2 and H3 are supported. In the second communication form of health knowledge—trust communication, there are a significant positive relationship between trust and health knowledge communication (β=0.544, p<0.001), and positive relationships between trust and perceived knowledge quality (β=0.549, p<0.001) and perceived source credibility (β=0.356, p<0.001). As such, H4, H5 and H6 are supported.

Furthermore, the model has a better validity as the R2 values shown according to the standard developed by Chin (1998). Namely, if the explanatory power (R2) is above the 0.67, the variable is described as substantial, if the explanatory power (R2) is above the 0.33 but below 0.67, the variable is described as moderate, if the explanatory power (R2) is above 0.19 and below 0.33, the variable is described as weak. Health knowledge communication (R2=0.340) is described as moderate, which signifies that health knowledge communication model has an acceptable validity.
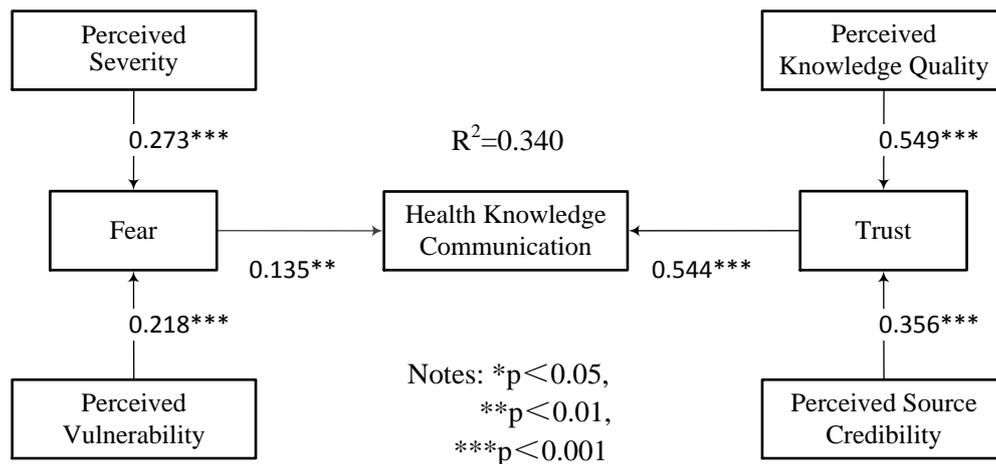
Fig. 3 Model testing results

5.2 Testing of the Moderating Effect

To test our hypotheses pertaining to the moderating effects, we construct 4 models successively to examine the impact of loss of face on the relationships between health knowledge communication and fear and trust. In the third communication form of health knowledge—face communication, according to the moderating effect analysis, loss of face has a significant negative impact on the relationship between trust and health knowledge communication ($\beta=-0.519$, p<0.05), with a better explanatory power ($R2=0.367$), but no significant impact on the relationship between fear and health knowledge communication. As such, H7(b) is supported, but H7(a) is not supported. Test details are shown in table 5.

Table 5 Moderating effect tests

	Hypothesis	**Model 1**	**Model 2**	**Model 2A**	**Model 2B**	**Result**
	H1:FEA→HKC	0.135**	0.132**	0.086ns	0.114*	Supported
	H2:PES→FEA	0.273***	0.273***	0.273***	0.273***	Supported
	H3:PEV→FEA	0.218***	0.218***	0.218***	0.218***	Supported
Main Effect	H4:TRU→HKC	0.544***	0.542***	0.543***	0.914***	Supported
	H5:PKQ→TRU	0.549***	0.549***	0.549***	0.549***	Supported
	H6:PSC→TRU	0.356***	0.356***	0.356***	0.356***	Supported
	LOF→HKC		0.012ns	-0.042ns	0.291*	
Interaction Effect	H7(a):FEA×LOF→HKC			0.082ns		Not Supported
	H7(b):TRU×LOF→HKC				−0.519**	Supported
Model Evaluation	R^2	0.340	0.340	0.340	0.367	

6 Discussion and Limitations

The purpose of our research has been to enhance understanding of the communication of health knowledge in social media and examine fear communication, trust communication and face communication in the communication of health knowledge based on the social media context. With a design and measurement source, we find supports for these three forms and explore their relationships.

First, we find that perceived severity and perceived vulnerability both has a positive effect on fear, and that fear has a positive effect on health knowledge communication. The fear communication

embedded in the communication of health knowledge in social media is testified, which implies that fear communication is an effective communication form of health knowledge to perform health education and health communication. Meanwhile, perceived severity and perceived vulnerability almost have equal impact on fear (β=0.273 VS β=0.218), which means that perceived severity and perceived vulnerability are two main criterions for people to evaluate the health knowledge and arouse fear.

Second, we find that perceived knowledge quality and perceived source credibility both has a positive effect on trust, and trust has a positive effect on health knowledge communication. The trust communication embedded in the communication of health knowledge in social media is testified, which implies that trust communication is an effective communication form. Perceived knowledge quality and perceived source credibility are proved to two main predictors of trust. And perceived knowledge quality has a stronger impact on the trust than perceived source credibility (β=0.549 VS β=0.356), which means the knowledge quality always plays as the primary dimension about health knowledge, and source credibility acts as a complement or an alternative of the quality once the evaluation about quality is in short or lack..

Third, we find the high level of loss of face lead to weaker influence of trust on health knowledge communication, but no significant influence for fear on health knowledge communication. The results imply the consciousness about loss of face in social media constrains trust communication, namely people translate fewer trust in health knowledge into communication due to the potential risk of loss of face. Face communication is still an effective communication form for health knowledge in social media—although the face consciousness restrains the communication of health knowledge. Taken together, face communication acts as a barrier and a countercurrent in the interaction with trust communication, but it explains the actual health knowledge communication better.

Meantime, the results also show that loss of face has no significant effect on the relationship between fear and health knowledge communication. Encountering the fear communication in social media about health knowledge, the face communication seem to loss its efficiency, which may be explained that the fear—an emotion response—act as a stronger emotion covering up the function of loss of face, the later acts as sub-consciousness in the social context—the consciousness exceed the sub-consciousness.

This study aims to contribute an initial examination of the communication forms of health knowledge in social media under the special Chinese culture context. Limited the initial study, there are several inherent limitations in current study. First, although the size of the sample is acceptable, all participants came from WeChat in China. Future studies should extend the research scope to other countries and cultures to make a comparison among the different cultures, so that some interesting results may emerge. Second, this study reveals and examines the fear communication, the trust communication and the face communication three communication forms in the communication of health knowledge in social media. However, there may be other communication forms, such as the humor communication about health knowledge (humor). Future researches may take studies to explore its interaction and impact on the health knowledge communication and explore other potential determinants. Finally, this study represents something of a pioneering effort in the health knowledge communication context—current health knowledge communication research scope is not very precise. Future studies can focus on a particular group or special age, such as the white collars group, the newborn mothers group, the middle aged and the aged.

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