

# EFFECTS OF INTERPERSONAL TRUST AMONG USERS OF ONLINE HEALTH COMMUNITIES ON PATIENT TRUST IN AND SATISFACTION WITH THEIR PHYSICIAN

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**Objectives:** Online Health Communities (OHCs) are increasingly being used by patients in the Web 2.0 era. Today's patients have instant access to a great deal of medical information and contacts. Despite the considerable development of OHCs, little is known regarding the impact on the patient–physician relationship. This research aims at filling this gap and examines how interpersonal trust on peer-to-peer OHCs influences two key relational variables, namely patient trust in the physician and patient satisfaction with the physician. It also investigates their influences on the patient's attitude toward the physician.

**Methods:** Drawing on both the relational and medical literatures, we propose a research model that brings out the relationships between interpersonal trust in OHCs, and patients' trust, satisfaction and attitude toward the physician. We then conduct a quantitative survey of 512 OHC users in France, using structural equation modeling to test our hypotheses.

**Results:** Our findings indicate that interpersonal trust in OHCs exerts a positive influence on both patients' trust in and satisfaction with their physician. It also highlights that these two relational variables have a positive influence on patient attitude toward the physician. Our findings also indicate that patient trust influences patient satisfaction with the physician.

**Conclusions:** This research highlights the importance of OHCs, which can be seen as valuable instruments for enhancing patient–physician relationships. It shows that healthcare managers should seek to enhance interpersonal trust among OHC users, because this trust has a positive influence on patient satisfaction with, trust in and attitude toward the physician.

**Keywords:** Online health communities, Patient–physician relationship, Patient satisfaction, Trust, Attitude

Internet and social media are fundamentally changing the way individuals manage their healthcare (1). Today, many Web sites and forums emphasize on user-generated content and have made it possible for individuals to exchange medical information and find social support on Online Health Communities (OHCs), unrestricted by time or geographical boundaries. OHCs can be seen as specialized subsets of online communities and defined as “a collection of small virtual discussion groups in which people with a common concern about a health topic share information, experiences, and feelings and provide support to fellow members” (2).

More precisely, OHCs enable their users to: (i) compare similar experiences, beyond the constraints of geographical or social status; (ii) have constant access to the community with no time, location, or schedule constraints; and (iii) enhance their health outcome and life quality. These communities have received increasing attention in the past few years. Of interest, scholars have underlined their benefits for both patients and practitioners (3). Because they provide patients with immediate medical information, as well as social support, OHCs appear to indicate a shift of power in the patient–physician relationship. The doctor–patient relationship has undergone a transi-

tion throughout the ages and is now moving away from a model characterized by a patient seeking help and a doctor whose decisions are silently complied with by the patient, toward a more patient-centered model in which the physician's dominance is reduced.

Although OHCs have gained considerable ground over the past 2 decades, little is known regarding their effects on the patient–physician relationship. This research aims at filling this gap and examines the effects of interpersonal trust among OHC users on patient satisfaction, patient trust, and attitude toward the physician. To do so, we draw on theories from the relational literature and propose and test five hypotheses.

## CONCEPTUAL BACKGROUND

OHCs provide individuals with a great amount of medical information, reports of personal experiences and emotional support. They can be viewed as “an asynchronous online message board system that contains at least one message board (usually more), each of which typically focuses on a single disease” (4). They enable users to interact anonymously with people sharing a similar health or medical concern, and provide them with

both instrumental (informational) and experiential (social and emotional support) benefits, for no charge and with no time constraints or geographical boundaries. OHCs are recognized to be efficient and popular tools for providing patients with accurate medical information as well as social support. They contribute to developing better-informed (5) and empowered individuals (6). The information gained through OHCs has been found to complement traditional sources rather than substituting for them (7). It provides the user informational and emotional support, and, therefore, facilitates the patient–physician cooperation.

To date, research on OHCs has mainly looked at the advantages and disadvantages of these communities (8); investigated the determinants, either demographics or psychographics (altruistic motivations and desire to share experiences) (9); underlined their benefits for users (3) or addressed the factors that drive the development and maintenance of the relationships among users (patients) (10). Little is known regarding the influence of OHCs on the “real world” patient–physician relationship. This research aims at understanding their impact by analyzing the influence of interpersonal trust between users of OHCs on patients’ satisfaction with, and trust in, their physician. To do so, we focus on peer-to-peer OHCs, that is, patient centric communities, which have neither the participation nor the endorsement by physicians or medical staff. These OHCs differ from communities of practice, which are geared toward communication between specific healthcare professionals (e.g., nurses, physicians) (10).

In this OHCs study, physicians are not involved and do not contribute to the community. A review of both the medical and relational marketing literatures was conducted to define and measure the research main constructs: trust, satisfaction and online communities in a medical context. Precisely, a keyword search on the databases PubMed, SCOPUS, JSTOR was undertaken. It also led to review the effects of interpersonal trust on subsequent relational variables and to propose research hypotheses.

#### **Effect of Interpersonal Trust between Users of OHCs on Patient Trust in and Satisfaction with the Physician**

In online contexts, interpersonal trust or social trust is defined as “the type of trust one agent has in another agent on a personal level” (11), or as the trust directed toward fellow online community members. With regard to online communities, interpersonal trust is conceived as a substitute for rules designed to ensure that others will behave as they should (12). It eliminates opportunistic behaviors and lays the foundations for a successful virtual community. Consistent with this view, interpersonal trust has been found to be a prerequisite for developing atmospheres that facilitate engagement with other members of the community. It also determines users’ membership continuance intentions, and members’ knowledge contributions to OHCs.

Interpersonal trust is a necessary condition for a person’s intention to take part in virtual community discussions. Interpersonal trust among OHC users is also seen as vital because it encourages users to anonymously share stories and information, and receive and give medical information about what can be very intimate conditions. Overall, interpersonal trust can be seen as providing the foundations for successful, lively virtual health communities (11).

We assume that an individual’s interpersonal trust in other members on OHCs will positively impact their relationship with their physician “in the real world.” Specifically, we expect that the interpersonal trust in OHCs will positively influence two key relational variables, the patient’s trust in the physician, and the patient’s satisfaction with the physician. As mentioned earlier, interpersonal trust facilitates information sharing in OHCs which contributes to patients being better informed (13). In turn, better informed patients are expected to feel more confident in exchanging knowledge with their physician and to get a clearer understanding of their physician’s evaluations and recommendations. Therefore, we assume that higher interpersonal trust in OHCs will positively impact both the trust in the physician and the satisfaction with the physician. This is also in line with the findings underlining that better-informed patients tend to have better health after-effects (14), which in turn lead to positive health outcomes (13).

In offline contexts, the commitment trust theory (15) has underlined that trust is a key mediator of participant exchanges, that is to say it determines participants’ relational co-operation and helps to focus individuals on mutual goals that prevent them from acting solely in their own self-interest. When trust exists between individuals, they are more willing to partake in a shared activity. Similarly, in online contexts, trust refers to an implicit belief that a partner will not engage in exploitive or opportunistic behaviors (11). In the medical literature, trust in the physician is shown to play a key role in the maintenance of the patient–physician relationship and like patient satisfaction, appears to be a critical indicator of that relationship. The initially unidimensional definition of trust in general has moved to a multidimensional conception built around three core dimensions: integrity, competence, and benevolence (15); while interpersonal trust online is conceived as having two dimensions: ability and integrity (12).

Patient satisfaction with the physician has been intensively studied in the medical literature. Research has highlighted that patients who are better informed about their disease or treatment choices are likely to experience greater satisfaction with their follow-up care and doctor. There is also evidence to show that better-informed patients are more involved in the healthcare decision-making process and subsequently during their treatment. In line with the medical literature and the disconfirmation of expectations paradigm, we define and operationalize satisfaction as a cognitive and emotional reaction, a fulfillment response to the user’s judgment that a physician during a

healthcare service experience is providing a pleasurable level of consumption-related fulfillment (14).

Hence, we hypothesize that:

*H1:* Interpersonal trust between users of OHCs exerts a positive effect on patient trust toward the physician.

*H2:* Interpersonal trust between users of OHCs exerts a positive effect on patient satisfaction with the physician

#### Effect of Patient Trust in the Physician on Patient Satisfaction with the Physician and Attitude toward the Physician

Trust and satisfaction have been studied together in the relational literature and shown to be strong predictors of attitudes (16). Many past studies have investigated the respective effects of these constructs on attitudes and behaviors. Although controversial, trust was shown to be a strong predictor of satisfaction, which in turn determines attitude (16). It was also found that, in parallel, trust has direct effects on behaviors and attitudes.

Attitude, defined as a predisposition to respond to an object in a favorable or unfavorable way (17), is another crucial construct in the relational literature, following the finding that attitudes are positively linked to individual intentions and behaviors. According to the theory of reasoned action, attitudes coupled with subjective norms determine people's behaviors. Identifying the determinants of attitude is, therefore, a matter of considerable importance. In online contexts, several constructs have been found to determine user attitude toward online communities. In the well-known Technology Acceptance Model (TAM), Davis distinguishes two main antecedents: perceived usefulness and perceived ease of use. Although interesting, this model remains at a macro level and does not focus on relational variables at a more micro level. Yet in the computer science and marketing literatures, user trust and satisfaction have also been identified and shown to be key predictors of user attitude online.

Drawing on both the literatures on trust and satisfaction, we hypothesize that:

*H3:* Patient trust in the physician exerts a positive effect on patient satisfaction with the physician

*H4:* Patient satisfaction with the physician exerts a positive effect on patient attitude toward the physician

*H5:* Patient trust in the physician exerts a positive effect on patient attitude toward the physician

## METHOD

### Sample

Over 900 individuals in France were contacted, of whom 634 completed a self-administered online survey distributed to users of peer-to-peer OHCs such as PatientsWorld, Carenity, or BePatient during 2016 in France. A total of 122 questionnaires were discarded because of incorrect or incomplete an-

swers, leaving a sample of 55 percent of the respondents were female and 45 percent male, which reflects the fact that women are significantly more involved in online searches for health information than men (18). The average age was 30 years, and ages ranged from 18 to 67 years. Twenty-three percent of respondents reported that they had a chronic condition (mainly diabetes, asthma, or Crohn's disease), and 35 percent of this group had suffered from their chronic condition for over 10 years (Supplementary Tables 1 and 2).

### Measures and Common Method Bias

The questionnaire used randomized measurement items to reduce measurement context effects and common method bias. The questionnaire was assessed by two senior researchers and pretested on respondents. So as to avoid any confusion or misunderstanding, the questions have been adapted to the French context (Supplementary Table 3). A Harman's single factor test was run on the four constructs and no single factor emerged, which suggests that common method bias is not a concern here. Attitude, satisfaction, trust toward the physician, and interpersonal trust were measured on seven-point Likert scales with anchors of strongly disagree (1) and strongly agree (7). Specifically, patient attitude toward the physician was adapted from Oliver (16) (see Table 1). Regarding interpersonal trust in OHCs, the scale was adapted from Hung et al. (19). The first dimension, ability, was measured by three items, and the second dimension, integrity, by two items. The scale for capturing trust in the physician was adapted from Doney and Cannon (20) and consisted of three dimensions. Lastly, the measurement of patient satisfaction with the physician was based on scales proposed by DiMatteo et al. (21) and consisted of four items. We also measured age and gender as control variables.

The reliability for each construct was assessed using the Cronbach's alpha indicator, which ranged from 0.82 to 0.92, above 0.7, thus suggesting good reliabilities. A confirmatory factor analysis was then conducted by the structural equation method using AMOS 23. All measurement scales showed that the psychometric qualities were adequate. The confirmatory analysis indicated that all items had standardized loadings above 0.5, indicating good quality in the data collected. The final set of variables is shown in Table 1.

The model tested shows a good fit to the data:  $\chi^2 = 324.23$  with 139 df at  $p$ -value  $< 0.001$  and chi-square to degrees of freedom ( $\chi^2/\text{df}$ ) is 2.33. In addition, the results reveal that model fit indices satisfy statistical norms, with comparative fit index (CFI) of 0.974 and root mean square error of approximation (RMSEA) of 0.051 (see Table 2). In comparison, the fit indicators for a previous version of the model were:  $\chi^2 = 773.78$  with 147 df at  $p$ -value  $< .001$ ;  $\chi^2/\text{df} = 5.26$ ; RMSEA = 0.091; CFI = 0.913; normed fit index = 0.895; SRMR = 0.057.

Table 2 depicts the correlations between constructs. All the correlations are significant and satisfactory. As recommended,

**Table 1.** Measures of the Constructs: Descriptive Statistics and Reliability Analysis

	Factor scores from EFA				CFA estimates (standard estimates)	Reliability standardized Cronbach's alpha
	(1)	(2)	(3)	(4)		
Interpersonal trust in OHCs (1)	Mean: 4.44; standard deviation: 1.16					
OHC members have good expertise in the topics covered	<b>0.799</b>	0.147	−0.273	0.127	0.544	0.82
OHC members' expertise helps me cope with my problems	<b>0.784</b>	0.103	−0.253	0.075	0.532	
The member comments posted on OHCs are easily understandable	<b>0.788</b>	0.072	0.249	−0.008	0.834	
OHC members strive to provide honest and sincere answers to questions	<b>0.818</b>	−0.016	0.214	−0.023	0.766	
OHC members are willing to share their experience of illness / pathologies	<b>0.583</b>	−0.018	0.503	−0.143	0.642	
Satisfaction with the physician (2)	Mean: 5.69; standard deviation: 1.15					
My physician is pleasant	0.077	<b>0.812</b>	0.293	0.228	0.845	0.89
Overall, my physician exceeds my expectations	0.100	<b>0.737</b>	0.373	0.345	0.929	
I consider that my physician gives me full explanations and explains things in simple language	0.132	<b>0.825</b>	0.235	0.154	0.787	
I have some doubts about the ability of my physician ( <i>reverse-scored items</i> )	0.085	<b>0.694</b>	0.172	0.335	0.711	
Trust in the physician (3)	Mean: 5.79; standard deviation: 1.17					
My physician keeps his/her promises	0.037	0.456	<b>0.504</b>	0.378	0.744	0.91
My physician is not always honest with me ( <i>reverse-scored items</i> )	−	−	−	−	−	
I believe the information that my physician gives me	0.049	0.336	<b>0.705</b>	0.288	0.777	
My physician is genuinely interested in improving my medical condition.	0.027	0.375	<b>0.637</b>	0.384	0.829	
When making important decisions, my physician considers my benefit as well as his/her own	0.011	0.392	<b>0.678</b>	0.403	0.890	
I trust my physician to have my best interests at heart	−	−	−	−	−	
My physician is trustworthy	0.003	0.445	<b>0.658</b>	0.372	0.888	
I find it necessary to be cautious with my physician ( <i>reverse-scored items</i> )	−	−	−	−	−	
Attitude towards the physician (4)	Mean: 6.01; standard deviation: 1.20					
I have negative / positive feelings about my physician	0.055	0.170	0.325	<b>0.770</b>	0.757	.91
I consider my physician to be bad / good	0.038	0.234	0.345	<b>0.803</b>	0.857	
I have an unfavorable / favorable opinion of my physician	0.055	0.391	0.256	<b>0.740</b>	0.904	
I would say that my physician is pleasant / unpleasant	−0.009	0.299	0.099	<b>0.750</b>	0.710	
I have a positive / negative perception of my physician	0.004	0.275	0.226	<b>0.802</b>	0.828	

Note.  $n = 512$ ;  $\chi^2 = 324,23$  ( $p$ -value  $< .001$ );  $df = 139$ ; root mean square error of approximation = 0.051; comparative fit index = 0.974; normed fit index = 0.956; standardized root mean square residual = 0.044; normed  $\chi^2/df = 2.33$ .

CFA = confirmatory factor analysis; EFA = exploratory factor analysis; OHC, Online Health Community.

Bold values indicate factor loadings higher than 0.5.

the average variance extracted (AVE) for each construct mobilized is above 0.5 (precisely, they range between 0.51 and 0.69), showing that the variance of each construct is better explained by its measures than by error. Table 3 also indicates that the composite reliability (CR) is systematically higher than the average extracted variance (AVE) for each construct, therefore, supporting convergent validity. Regarding discriminant validity, the data indicate that each construct is more closely correlated with its own measures (manifest variables) than with other constructs (latent variables). Table 2 also highlights that for

each of the four constructs, the maximum shared squared variance is below the AVE. Additionally, the average shared square variance appears to be systematically lower than the AVE for each construct, therefore, supporting discriminant validity.

## RESULTS AND DISCUSSION

The five hypotheses were tested through a structural analysis (AMOS 23). The results support all five hypotheses, confirming the influence and direct effects of the studied variables (cf. Figure 1).

**Table 2.** Correlations, MSV, ASV, and Fornell and Larker Criteria

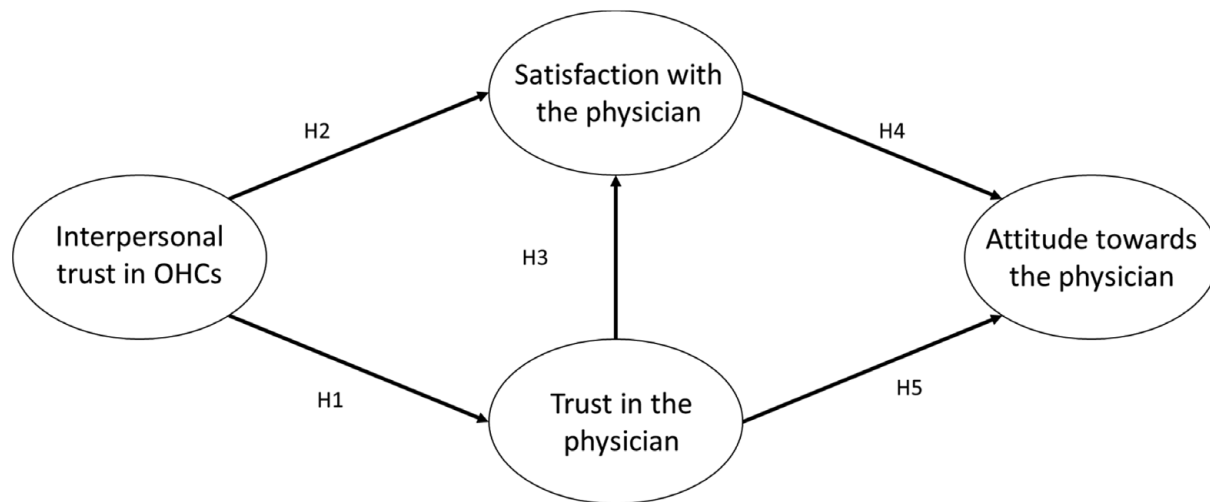
	CR	AVE	MSV	ASV	(1)	(2)	(3)	(4)
Attitude toward the physician (1)	0.907	0.663	0.576	0.386	0.814			
Satisfaction with the physician (2)	0.897	0.687	0.624	0.418	0.751	0.829		
Interpersonal trust in OHCs (3)	0.834	0.507	0.066	0.040	0.136	0.257	0.712	
Trust in the physician (4)	0.918	0.692	0.624	0.412	0.759	0.790	0.192	0.832

CR, composite reliability; AVE, average variance extracted; MSV, maximum shared squared variance; ASV, average shared square variance; OHC, Online Health Community.

**Table 3.** Standardized Coefficients

	$\beta$	SE	<i>p</i>
Interpersonal trust in OHCs - Trust in the physician	0.200	0.051	.000
Interpersonal trust in OHCs - Satisfaction with the physician	0.120	0.038	.000
Trust in the physician - Satisfaction with the physician	0.774	0.053	.000
Satisfaction with the physician - Patient attitude towards the physician	0.410	0.055	.000
Trust in the physician - Patient attitude towards the physician	0.437	0.060	.000

OHC, Online Health Community.

**Figure 1.** Research model.

Specifically, the results highlight that the user's interpersonal trust in information provided and exchanged in OHCs has a direct effect on patient trust in the physician ( $\beta = 0.200$ ;  $p = 0.000$ ), therefore, confirming the first hypothesis, H1. The findings also support the idea that the user's interpersonal trust in OHCs exerts a positive influence on patient satisfaction with the physician ( $\beta = 0.120$ ;  $p = 0.000$ ). Therefore, hypothesis H2 is supported. As predicted, patient trust in the physician is found to have a strong effect on patient satisfaction with the physician ( $\beta = 0.774$ ;  $p = 0.000$ ) as well as on the patient's attitude toward the physician ( $\beta = 0.437$ ;  $p = 0.000$ ), confirming

hypotheses H3 and H5, respectively. Lastly, the data show that patient satisfaction with the physician has a strong positive direct effect on the attitude toward the physician, supporting H4 ( $\beta = 0.410$ ;  $p = 0.000$ ).

Collectively, our data highlight that interpersonal trust in OHCs has a critical influence on subsequent variables characterizing the tangible patient–physician relationship, patient satisfaction with the physician, and patient trust in the physician.

Of interest, our data also show, as predicted in our model (cf. Figure 1), that both trust in the physician and satisfaction with the physician have a direct effect on a patient's attitude

toward the physician. This is of interest because a favorable patient attitude can be seen as a proxy for the patient's desire to create strong bonds with his physician. There is a clear indication that OHCs have an impact on the real-world relationship between the patient and the physician. Although the physician has been shown to remain the primary source of information, this research confirms that OHCs can be seen as a strategic tool that can help create, maintain, and reinforce the patient–physician relationship.

### Implications

**Research Implications.** In a theoretical perspective, our results underline the contribution of interpersonal trust in OHCs, which is found to exert a positive influence on the “real-world” patient–physician relationship, through patient trust and patient satisfaction with the physician. This suggests that the patient–physician relationship depends not only on the physical encounter between the patient and the physician, but also on the patient's interactions in the virtual world with other patients and Internet users. The Internet in general and peer-to-peer OHCs in particular appear to have the potential to enhance the patient–physician encounter.

Of interest also, in line with previous findings, this study highlights that the patient's attitude toward his/her physician is determined by the degree of trust in and satisfaction with the physician. This is consistent with the relational literature, which stresses the paramount importance of both consumer satisfaction and trust to build and maintain ongoing mutually profitable relationships with providers. Additionally, our findings highlight that patient trust in the physician impacts patient satisfaction, indicating that building patient trust in the physician is a prerequisite for developing patient satisfaction.

This research provides a new theoretical framework, drawing on both the relationship and medical literatures, to analyze the effects of online health communities on the patient–physician relationship. It, therefore, lays the foundations for a better understanding of the patient–physician relationship in the Internet era. It is now generally well-known and accepted that the Internet plays a primary role in patients' search for information. It is also acknowledged that the development of the Internet in general and the increase in the number of Web sites with user-generated content in particular have moved the patient–physician relationship away from a paternalistic conception where the physician holds all the information, toward a shared-information model involving a more knowledgeable and empowered patient. In this context, OHCs can be seen as contributing to the new healthcare model that uses co-generated information resulting from interaction between three parties: OHCs, physicians, and patients. It thus proposes a starting point for studying the impacts of online medical platforms on construction of the patient–physician relationship over time.

**Practice Implications.** In a managerial perspective, this research stresses the critical role of peer-to-peer OHCs in contemporary healthcare services. Our results indicate that medical managers and practitioners should pay particular attention to OHCs, with a specific focus, if possible, on increasing interpersonal trust in these communities. This could be achieved through practices that help users to easily identify the medical information they want on OHCs. Good Web site design is also important to help users easily locate the right medical information and feel confident in using it. Administrators of OHCs should also develop processes to ensure that OHC users give the right medical information to the right people. Overall, physicians, healthcare partners, and governments should take this opportunity to build a more efficient client-centered health system, in which OHCs can reinforce the patients' trust and satisfaction toward their physicians.

Scholars have found that OHCs still have a poor image among physicians and other medical professionals, who remain doubtful as to the information delivered, and often skeptical regarding the user's capacity to understand and interpret medical information (22). However, because OHC communities mostly provide accurate medical information, and contribute to making patients better informed (13), leading to better health outcomes and more appropriate use of health services (14), medical practitioners should consider using these communities which have the potential to enhance their relationship with their patients. Bearing in mind also that OHCs are recognized as efficient and popular tools for providing patients with medical information, and that healthcare service costs combined with continually rising patient expectations are challenging contemporary healthcare systems, emphasis should be put on mobilizing all healthcare actors to integrate OHCs into their practices.

To synthesize, we believe that physicians can benefit from OHCs for several reasons. First, because OHCs have the potential to enhance patients trust and satisfaction toward the physician, they should be considered as a tool to strengthen the patient–physician relationship. Second, OHCs provide patients with a large amount of key medical information on their health issues and concerns. Under proper guidance and coordination with the physician, this information could contribute to a more effective visit to a doctor, saving time and money. Third, it has been shown that better-informed patients have better medical outcomes (14). This is a further argument for the use of OHCs by healthcare actors.

### Limitations and Future Research

Although our research is promising, it has several limitations which should be considered as research opportunities. First, replications are needed to increase the external validity of our findings. In particular, additional work is required for OHCs that count physicians who moderate the medical information

content. Second, our data clearly show that our sample was rather young, which is consistent with users' demographics of digital tools. It is, therefore, of interest to understand why older people do not use OHCs. We may hypothesize that this is due to a lack of ability. We may also consider that older people refer exclusively to their physician. In the same vein, it should be examined if people skills or education affects their access and use of OHCs. Third, more research is needed to test our hypotheses in other medical systems, for example systems where physicians are less accessible to their patients. Complementary research could be carried out with an international scope, including other countries with different medical systems. Fourth, as mentioned earlier, other relational variables from the marketing relational literature should be investigated to refine our research framework. User and physician commitment or perceived value would be an interesting variable to examine the impact of OHCs on the patient–physician relationship. Fifth, negative issues, as the risks associated with the OHCs should be examined. Specifically, investigating how some false or misleading information is regulated on OHCs not moderated by health professionals should help to handle these communities. Finally, another possible avenue for the future research lies in the study of how physicians and other healthcare professionals perceive OHCs' impacts on the patient–physician relationship.

## SUPPLEMENTARY MATERIAL

To view supplementary material for this article, please visit <https://doi.org/10.1017/S0266462317004433>

## CONFLICTS OF INTEREST

The author has nothing to disclose.

## REFERENCES

- Vennik FD, Adams SA, Faber MJ, Putters K. Expert and experiential knowledge in the same place: Patients' experiences with online communities connecting patients and health professionals. *Patient Educ Couns*. 2014;95:265-270.
- Wright KB. Social support within an on-line cancer community: An assessment of emotional support perceptions of advantages and disadvantages, and motives for using the community from a communication perspective. *J Appl Commun Res*. 2002;30:195-209.
- van der Eijk M, Faber MJ, Aarts JW, Kremer JA, Munneke M, Bloem BR. Using online health communities to deliver patient-centered care to people with chronic conditions. *J Med Internet Res*. 2013;15.
- Fan H, Smith SP, Lederman R, Chang S. Why people trust in online health communities: An integrated approach. 21st Australasian Conference on Information Systems; 2010.
- Johnston AC, Worrell JL, Di Gangi PM, Wasko M. Online health communities: An assessment of the influence of participation on patient empowerment outcomes. *Inf Technol People*. 2013;26:213-235.
- Audrain-Pontevia AF, Menvielle L. Do online health communities enhance patient-physician relationship? An assessment of the impact of social support and patient empowerment. *Health Serv Manage Res*. 2017;951484817748462.
- Griffith F, Cave J, Boardman F, et al. Social networks - The future for health care delivery. *Soc Sci Med*. 2012;75:2223-2241.
- Kanthawala S, Vermeesch A, Given B, Huh J. Answers to health questions: Internet search results versus online health community responses. *J Med Internet Research*. 2016;18:e95.
- Bright P, Hamblin K, Tamakloe S. What is the profile of individuals joining the KNEEGuru Online Health Community? A cross-sectional mixed-methods study. *J Internet Med Res*. 2016;18:e84.
- El Morr C, Eftychiou L. Evaluations frameworks for health virtual communities. In: Menvielle L, Audrain-Pontevia A-F, Menvielle W, eds. *The Digitization of healthcare. New challenges and opportunities*. United Kingdom: Palgrave MacMillan; 2017.
- Leimeister JM, Ebner W, Krcmar H. Design, implementation, and evaluation of trust-supporting components in virtual communities for patients. *J Manag Inf Syst*. 2005;21:101-135.
- Rindings CM, Gefen D, Arize B. Some antecedents and effects of trust in virtual communities. *J Strateg Inf Sys*. 2002;11:271-295.
- Wald HS, Dube CE, Anthony DC. Untangling the Web: The impact of Internet on health and the physician-patient relationship. *Patient Educ Couns*. 2007;68:218-224.
- Street RL, Makoul G, Arora NK, Epstein RM. How does communication heal? Pathways linking clinician–patient communication to health outcomes. *Patient Educ Couns*. 2009;74:295-301.
- Morgan RM, Hunt SD. The commitment-trust theory of relationship marketing. *J Mark*. 1994;58:20-38.
- Oliver RL. A cognitive model of the antecedents and consequences of satisfaction decisions. *J Mark Res*. 1980;17:460-469.
- Wilkie WL. *Consumer behavior*, 3rd ed. New York: John Wiley & Sons; 1994.
- Ybarra ML, Suman M. Help seeking behavior and the Internet: A national survey. *Int J Med Inform*. 2006;75:29-41.
- Hung KH, Li SY, Tse DK. Interpersonal trust and platform credibility in a Chinese multi-brand online community: Effects on brand variety-seeking and time-spent. *J Advert*. 2011;40:99-112.
- Doney PM, Cannon JP. An examination of the nature of trust in buyer-seller relationships. *J Mark*. 1997;61:35-51.
- DiMatteo MR, Hays RD, Prince LM. Relationship of physicians' non-verbal communication skill to patient satisfaction, appointment noncompliance, and physician workload. *Health Psychol*. 1986;5:581-594.
- Murray E, Lo E, Pollack L, et al. The impact of health information on the Internet on health care and the physician-patient relationship: National U.S. survey among 1,050 U.S. physicians. *J Med Internet Res*. 2003;5/3:e17.