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Health Practitioner Perceptions of using a Health Virtual Community of Practice for their Continuing Professional Development

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Health Practitioner Perceptions of using a Health Virtual Community of Practice for their Continuing Professional Development

Completed Research Paper

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Abstract

Health practitioner (HP) use of online social networks for learning and knowledge sharing has increased in the past decade, leading to the evolution of virtual communities of practice (VCoP). However, there is limited research on VCoP use for HPs' continuing professional development (CPD) as a legitimate means of learning and sharing knowledge with their peers from a tools perspective. This paper continues our previous work about design and role considerations to explore HPs' perceptions of using a VCoP for CPD purposes and reports qualitative study findings from two focus groups conducted with 12 HPs in each group. Our findings suggest that our design and role considerations are important when designing a sustainable Health VCoP for CPD. We identify a new design construct (Patient Information Anonymisation) that extends our conceptual model, and make theoretical and practical contributions that extend the Health VCoP literature.

Keywords: Virtual Community of Practice, Continuing Professional Development, Health Practitioners

Introduction

There is an increase in the adoption of online communication technologies by groups of individuals to pursue and share similar interests (Cummings et al. 2002; Lederman et al. 2014; Preece 2000; Sproull and Arriaga 2007). Online communities have the potential to strengthen the learning and knowledge sharing proficiencies of the individuals involved (Holmström and Henfridsson 2006; Majchrzak et al. 2013; Yoo et al. 2010) especially for developing continuing professional development (CPD) competencies (Lewis and Allan 2004; Wenger et al. 2002). Professional individuals engaging in groups to learn and increase their knowledge about shared interests are called a “Community of Practice” (CoP) while a “Virtual Community of Practice” (VCoP) refers to an online community with distributed members who draw on the Internet as a platform to communicate and collaborate (Snyder and Wenger 2010; Wenger et al. 2002).

Our previous paper, by Murad et al. (2016), draws on the VCoP literature to inform the design of a VCoP for health practitioners (HPs). Findings of this paper highlight two individual and two group design considerations and one role consideration in designing a Health VCoP for sustaining learning and knowledge sharing. These include rich profile information (representing individual VCoP participants), platform navigation (allowing quick access to individuals), a diverse community (represented in the group), rich contextual content (for group collaborations), and human roles (facilitation of the platform). Sustained learning and knowledge sharing is an integral part of the continuous process of learning and knowledge sharing. Therefore, a vibrant discussion forum is necessary to keep VCoP members engaged allowing them to contribute to discussions in a VCoP (Snyder and Wenger 2010; Wenger et al. 2002).

Virtual communities are generally arduous to administer, improve, and support participants through time to justify its use (Butler et al. 2014) especially in healthcare where the design of online networks for learning purposes has not yet been explored (Li et al. 2016). Current literature on HPs’ use of Health VCoPs focuses more on behavioural aspects associated with use (Lederman et al. 2014; Rolls et al. 2016) in lieu of how the tool itself can increase participation that nurtures online learning and knowledge sharing practices. Furthermore, HP use of Health VCoPs for CPD have only been explored from a medical-viewpoint and/or behaviours (Li et al. 2009; Ranmuthugala et al. 2011) and not from a tool feature perspective to assess whether a customised *Health VCoP design* can sustain learning and knowledge sharing practices (Murad et al. 2016). Facilitating a proper and efficient Health VCoP can incentivise and convince HPs in utilising them for learning and knowledge sharing activities especially for CPD (Rolls et al. 2016; Yee et al. 2014). Health VCoPs can provide another avenue of CPD for remote and rural HPs (Barnett et al. 2014; Yee et al. 2014) and overall assist all HPs in better managing their constant time pressures associated with their work structures and environment (Hanlis et al. 2009).

This paper extends our previous publication beyond HPs’ behaviour when using VCoPs to explore how design features/considerations of a prototype Health VCoP sustain learning and knowledge sharing in this community from a CPD perspective. The main research question is: *How do design and role considerations impact the continuing professional development (CPD) of health practitioners (HPs) in a Virtual Community of Practice (VCoP)?*

To answer this question, this paper will formulate a set of questions from the design and role considerations provided and report on two focus group sessions conducted with a group of HPs to gain their insight and perceptions on using a Health VCoP for their CPD. A re-evaluation, extension, improvement, and validation of the design and role considerations will be incorporated in the final design of the Health VCoP prototype from the feedback gained from the two focus groups.

This paper is organized as follow: First, we review existing literature on Health VCoPs and CPD. Second, we discuss the conceptual model using constructs that we will be using for our analysis. Third, we discuss the research methodology used. Fourth, we present the findings based on the questions derived from the design considerations and conclude with a discussion, limitations and future research.

Background Literature

Health VCoP and Continuing Professional Development

Professional networks can lead to industry collaborations and employment opportunities (Davenport et al. 1998). Professional networks come in many forms such as: private networks in business

organisations for users to learn and share knowledge with other users in tandem with organisational goals, aims, strategies, etc. (Wasko and Faraj 2005); private networks for teacher professional development to improve teacher's practices (Schlager and Fusco 2003); and private networks for HPs to learn and share knowledge regarding emergency cases (Curran et al. 2009).

Online social networking sites have matured as a tool for knowledge sharing purposes as electronic networks of practice (Wasko and Faraj 2005) and as knowledge networks (Grant 2016). Online social networking sites have become an important platform for facilitating intra-and inter-organisational group discussions (Baldwin and von Hippel 2011). As technological advancements in social networking platforms (i.e. Facebook, Twitter, WhatsApp, etc.) increase their presence in our daily lives, the healthcare sector has, in the past decade, witnessed a rise in the adoption and sharing of knowledge through online social networking sites (Rolls et al. 2016). Benefits of Health VCoPs include: knowledge sharing of evidence-based medicine (Rolls et al. 2016); bridging of professional isolation (Barnett et al. 2012); and promotion and implementation of innovative ideas in medicine (Mendizabal et al. 2013).

Continuing Professional Development (CPD) for health practitioners (HPs) involves a continuous process of learning that increases and refreshes HP's practice knowledge and skills (Brace-Govan and Gabbott 2004; MacWalter et al. 2016; Samad et al. 2014). CPD is a lifelong learning activity for all HPs that need be either re-evaluated in "refresher courses" or renewed on newfound evidence-based approaches in medicine (Bjerre et al. 2015). HPs also differ in what type of CPD they are seeking depending entirely on what they need appraised or where they lack knowledge (Salinas 2014).

Previous research shows little evidence that VCoP's online learning and knowledge sharing is beneficial for CPD (Cook et al. 2008; Curran and Fleet 2005; Wutoh et al. 2004). Some researchers posit that using VCoPs for health CPD purposes is flawed and a myth (Nonnecke and Preece 1999; Sandars and Heller 2006; Sandars et al. 2007; Urquhart et al. 2002) where healthcare is usually an environment of hierarchy and specialization (Currie and Suhomlinova 2006). Furthermore, VCoPs may actually promote discord and power conflicts that impede learning and knowledge sharing due to attempts to standardize healthcare practices (Currie and Suhomlinova 2006; Ferlie et al. 2005; Gabbay et al. 2003). In addition, participation has always been poorly understood (Mørk et al. 2008; Oborn and Dawson 2010). Hence, finding evidence of CoP effectiveness in improving medical evidence-based practice, and mentoring new HPs is difficult due to the intricacy and multi-faceted nature of CoPs in general (Li et al. 2009) while the design of Health VCoPs for CPD is in itself a monumental task (Castells 1996; Wittel 2001).

Health VCoPs that have been used previously in the literature for learning and knowledge sharing purposes were created using a pre-existing social network (i.e. Yahoo! Groups) (Hara and Hew 2007), using online social software (i.e. Ning) based on simplicity of using and overseeing the technology (Barnett et al. 2014), or using an existing virtual network belonging to a local public entity that had been pre-installed for use (Lara et al. 2016). Mendizabal et al. (2013) conducted a study on adapting requirements from stakeholders involved in a Health VCoP through the process of developing software, but failed to mention factors required to sustain learning and knowledge sharing habits of participants involved. This can be explained by current researchers who focus on medical issues related to behaviour from using Health VCoPs (Rolls et al. 2016), rather than using the Health VCoP as a catalyst for assisting continuous learning and knowledge sharing processes (Murad et al 2016).

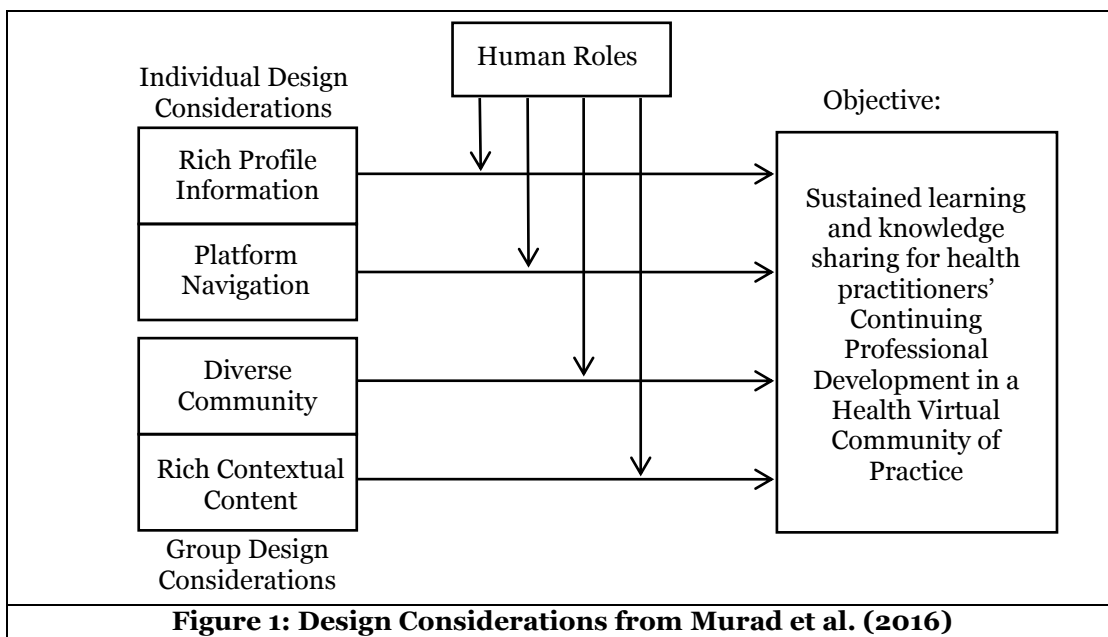
Ranmuthugala et al. (2011) found that Health CoPs can be used as a tool to develop clinical practice and facilitate medical evidence-based practices with CoP members directly engaged in healthcare. Rolls et al. (2016) provided an integrated review on how HPs use social media tools to create their own virtual communities with the most common reason being HPs sharing of specialty knowledge to discuss issues and learn more. Furthermore, a shift in learning, sharing and adopting explicit evidence-based medical knowledge into work practices, has ensued in the adoption of Health VCoPs (Ranmuthugala et al. 2011; Rolls et al. 2016).

Generally Information Systems (IS) professionals have had to discern which technologies facilitate online discussion in virtual communities, as virtual communities are naturally complex to manage, develop, and sustain (i.e. participation, learning, knowledge sharing, etc.) over time. It is difficult to justify utilisation of the technology (Butler et al. 2014). Furthermore, designing and facilitating online social networks in healthcare is challenging and is yet to be understood from a learning theory perspective (Li et al. 2016). However, online social networks may provide an opportunity to support HPs' CPD based on their own specialised needs (Curran et al. 2007; Li et al. 2014). Due to advancements in social media tools it is an opportune time to design and develop a Health VCoP for

HPs to learn and share knowledge to advance their CPD. Thus, we will be using our prior design considerations to design and develop a Health VCoP for HPs' CPD purposes.

Design Considerations for a Health VCoP

Our prior work (Murad et al. 2016) synthesised our conceptual model from the literature (i.e. business, education, health, etc.) based on Snyder and Wenger (2010)'s conceptual framework of VCoPs to understand social constructivism learning activities in work practices. Social constructivism learning theory entails that over time, learners develop an understanding through continuous participation of the common practices, tools, languages, and values of the professional culture of their learning environment (i.e. VCoP) (Soloway et al. 1996). Snyder and Wenger (2010)'s conceptual framework relied on three dimensions to explain the effectiveness and efficiency of a community's social constructivism learning dynamism: 1) domain (provides identity and meaning to participants by not providing abstract and uninteresting experiences); 2) community (diverse participants involved would increase their innovative ideas and knowledge through collaborative learning instances that create the "feeling of a community"); 3) practices (any activity that involves learning and innovation that expands the specific VCoPs knowledge practices).



From Figure 1, design considerations need to be distinct from individual and group design considerations for any VCoP (Wenger 1998; Wenger et al. 2002). There are four design considerations and one role that need to be considered as explained in the sections that follow:

i) Rich Profile Information (individual design consideration)

Providing participants with a customisable profile enables individual identity, empowering them for social networking opportunities (Toma 2010), leading to a rich presentation of personal content (Stephanidis 2001). This enhances the likeness of socializing with other participating users resulting in increased participation in the social network (Merolli et al. 2013). An example would be providing a first and last name to each user which formulates a participant's real identity that results in increasing trust among participants due to knowing who each participant is as a real person (Ardichvili et al. 2003). Hence, providing a rich user/learner profile can increase a users' participation in a Health VCoP (Murad et al. 2016) leading to a sustained CPD experience for HPs.

ii) Platform Navigation (individual design consideration)

Assessing and testing a users' technical skills when designing a VCoP is imperative for its success (Guldberg and Mackness 2009) as receiving design feedback from users and knowing that users see the VCoP as an easy-to-use platform can help in increasing participation (Munro et al. 2012; Xu et al. 2006). Positioning of icons and tools to navigate through the VCoP platform must be in a logical flow

as illogical placements will hinder participants in using the VCoP (Hansen et al. 2010). An example would be providing helpful hints, tips (Öksüz et al. 2014; Sammel et al. 2014), or a short video tutorial on how to use the interface for new and existing participants (Grossman and Fitzmaurice 2010). Thus, an easily navigable platform increases user participation in a Health VCoP (Murad et al. 2016) leading to a sustained CPD experience for HPs.

iii) Diverse Community (group design consideration)

A diverse non-competing group of HPs that share the same drive to learn and share knowledge can increase their participation and satisfaction due to the networking opportunities provided in the VCoP (Barnett et al. 2014; Jiménez-Zarco et al. 2015). Introductory postings in a VCoP can help in building trust among users involved in a diverse community especially in different fields but with the same objective of solving an agreed-upon issue (Barnett et al. 2012; Curran et al. 2009). An example would be pinning the introductory posts to the top of the VCoP platform for all to see (Hansen et al. 2010). Hence, a diverse community increases user participation in a Health VCoP (Murad et al. 2016) leading to a sustained CPD experience for HPs.

iv) Rich Contextual Content (group design consideration)

High quality content provided to participants can be an incentive to increase VCoP participation (Snyder and Wenger 2010; Wenger et al. 2002). HPs using the VCoP expect high quality content as it is an incentive and motivation as a result of being time poor (Sandars et al. 2007). An example would be providing an option for instant feedback for participants involved in the VCoP, to instantaneously updating of erroneous information and evolving the VCoP as a whole content wise (Barnett et al. 2014; Curran et al. 2009; Merolli et al. 2013). Thus, rich contextual content can increase user participation in a Health VCoP (Murad et al. 2016) leading to a sustained CPD experience for HPs.

v) Human Roles

Depending on each design consideration, human roles can impact the CPD of those involved in the Health VCoP. Moderation and assisting capabilities should be provided for new and current participants by adding profile information when needed, and technical support to help participants in navigating the Health VCoP are instrumental in introducing new members in the group and supporting their navigation through the Health VCoP (Hansen et al. 2010; Safko 2010). Furthermore, moderating the discussions with appropriate tools to stop and block inappropriate users actions to maintain the community's veracity and value is important (Faraj et al. 2015; Wasko and Faraj 2005). Maintaining high quality content (i.e. gatekeeping content (Bosua and Evans 2012)) is important to as users trust in facilitator roles to manage poor content, may lead to increased user participation (Preece and Shneiderman 2009).

Research Methodology

This study followed a qualitative research methodology: synthesis of a conceptual model of a Health VCoP design considerations for CPD to assess through a focus group HP feedback on the initial prototype design of a Health VCoP. Focus groups allow participants (HPs) to more easily express themselves when part of a like-minded group than through an individual research interview with researchers as they may feel more comfortable in a focus group session (Kitzinger 1995; Yin 2015). We focused on gathering rich feedback from our focus group participants and invited a mixture of HPs (general practitioners (GPs), a specialist, and nurse) who could collectively share their thoughts on a Health VCoP for CPD. Eight focus group questions were derived from our initial design and role considerations with the help of a senior GP and specialist. Ethics approval had been granted to conduct the study.

The questions started asking HPs about their use of the internet for professional development and if they searched online or asked a colleague when a patient comes forth with an unusual issue to manage. Questions then progressed to how HPs learned online for CPD and if they were involved in any online communities for said CPD. This continued with asking about opportunities gained being involved in an online community for CPD and what incentives were provided to HPs to be active. This included asking if knowing online group members beforehand had any effect on their judgment for joining the online community. Finally, we ended the questions with suggestions on what circumstances would be needed for an HP to join a Health VCoP for CPD.

Data Collection

Data were collected by two means: two focus groups consisting of 12 HPs (total of 24 HPs); a questionnaire sent to each HP to complete in their permitted time and asking additional information that they did not want to share in the group setting or did not remember in time. All GPs involved were in senior positions. Both focus groups were conducted by receiving permission to join a regular gathering of GPs every quarter of the year to discuss new technological medical advancements in their field of general practice, hence, the research team took the opportunity to gather data. Focus group discussions amounted to 30 minutes each and group interview transcripts were analysed via discourse analysis (Fairclough 2013).

Table 1. Focus Group Participants Information				
Participant	Gender	Attended Focus Group 1	Attended Focus Group 2	Used the Internet for learning in the past
GP1	Male	Yes	Yes	
GP2	Female	Yes	Yes	
GP3	Female		Yes	Yes
GP4	Female	Yes	Yes	Yes
GP5	Male	Yes	Yes	Yes
GP6	Male	Yes		Yes
GP7	Female	Yes	Yes	
GP8	Female	Yes		
GP9	Male	Yes		
GP10	Male	Yes		Yes
GP11	Male	Yes	Yes	Yes
GP12	Female		Yes	Yes
GP13	Female		Yes	Yes
GP14	Female		Yes	Yes
Specialist	Male	Yes	Yes	
Nurse	Female	Yes	Yes	

Table 1. Focus Group Participants Information

Two focus groups were conducted with a three-month period in-between. After both sessions, notes taken were validated by the GP chair and specialist involved in both focus group sessions. Furthermore, four senior GPs (GP4, GP5, GP6, and GP14) answered the questionnaire provided after the aforementioned group sessions. This study took place in Melbourne, Australia.

Findings

GPs were asked eight questions on their insights of using a Health VCoP for CPD purposes and on how they perceived the VCoP's success in maintaining interest for the foreseeable future. By applying our conceptual model, we report on the findings.

Rich Profile Information (Individual Design Consideration)

In terms of trusting others in an online community, one GP mentioned that she needed to know other participants information including general information and achievements, noting that it would be better to have already met him/her before. Furthermore, she would never go to an online forum and start reading and contributing unless it was worthwhile use of her time. This was the shared consensus of all HPs.

“The participants need to be health professionals and there would need to be verification of qualifications.” – GP2

Platform Navigation (Individual Design Consideration)

All GPs agreed that the platform had to be easy to use, as being difficult to do so would entail total inactivity in the Health VCoP. Prompting participants in changing their passwords from time to time would hinder their usability experience in the Health VCoP. A GP then mentioned that implementing some form of an asynchronous communication to try and minimize the time-poor situations that HPs in general face on a daily basis is a step forward. Furthermore, adding the option of the Health VCoP being accessible in app form would help in being accessible anytime, anywhere.

“Not too hard to access” – GP1

“If there is an app. It will be active and used regularly.” – GP4

Diverse Community (Group Design Consideration)

A GP mentioned that there is no need for an incentive to join an online community as he was already engaged in such a community beforehand and being part of the community is already incentive enough. However, this sentiment was not shared by other GPs who have never joined an online community stating that they lacked trust in sharing information with others as there is a risk in doing so. Hence, they would rather refer the patient with his/her diagnosis to a specialist. This notion led to circumventing responsibility entirely to the specialist.

“One of the biggest problem in this area when you talk about doing this in time across the health system is that people worry about the medical aspects of... they worry about all sorts of things as if they put their case and get some advice on from an internet based versions, somehow I don't know why that's more risky than if you refer someone of to someone and write a letter back from an expert because of full responsibility.” – GP2

GPs also liked the idea of having GP registrars included in the Health VCoP to see opinions of the new generation and not just the senior generation as the young registrars are more experienced in and fully willing to use technology.

There appears to be a lack of communication between GPs and specialists when receiving letters or diagnosis from each other as the specialists do not necessarily trust GPs diagnosis methods.

“The interaction with hospital specialists, I just want to say one thing about that because I have sat in hospital clinics as a specialist for longer than I'm going to confess. But one of the problems comes back to that ancient issue of communication...” – Specialist

“Yes.” – GPs (all)

“...and not knowing, I mean 99% of the time sitting in a specialist clinic, I really don't know what you guys are actually doing with these patients, I just don't know, so in that situation you tend to take a very conservative stance. If I don't know anything you do I assume you do nothing which is not true but it's sort of a protective reflex.” – Specialist

A GP then added that including a specialist in the Health VCoP is a welcome addition as some expressed that is an incentive to join a Health VCoP especially for CPD purposes.

“It would be great to also add something in about the communication between specialists and GPs and be involved in the discussion.” – GP 11

Rich Contextual Content (Group Design Consideration)

GPs agreed that the Health VCoP must meet their standard of quality to save time and should be clinically relevant. This prompted a discussion on their learning methods in receiving CPD, which amounted to having different paths than the specialist. GPs agreed that they learn mostly by discussing with each other, and would like the opportunity to have GP trainees join the discussions.

“Most people learn by discussion.” – GP1

“We have 1400 registrars and would like to ask for their advice; all of them have good work.” – GP3

GPs when searching for content often search online or ask their colleagues via email. However, a specialist would learn most of his evidence-based medicine via case management.

“As a resource to google information, going to what I believe to be reliable websites eg better health, CDC, subscriptions sites eg therapeutic guidelines, access hospital websites for

information, access patient information for handouts., information from RACGP, Medical indemnity” – GP2

“Email colleagues for professional communication, sharing articles etc.” – GP4

“I learned most of my medicine from the experience of managing cases.” – Specialist

A GP mentioned that resources should be available to community participants.

“Resources made available to participants eg community, internet tools, guideline updates, news flash, new management options. Etc.” – GP4

Another GP mentioned that he would sometimes look for quality improvement for his practice rather than clinical outcomes.

“It might be worth to look at *Website* for the improvement thing run by the *Provider* has a 100 odd GPs. They gather data every month, they have regular webinars about a whole variety of quality improvement activities which is something that has been going on for five years, but not so much about clinical outcomes more about quality improvement of the practice.” – GP6

Human Roles

GPs agreed that there must be some form of a vetting process for peoples’ behavior, conduct, and discussing content in the Health VCoP for CPD. A facilitation role is needed to maintain integrity and hold informative discussions to take the Health VCoP seriously.

“I think there would need to be some supervisors of the community...The participants need to be respectful and take the site seriously, and a robust discussion is good but an aggressive one is off putting...Some individuals were sarcastic in replying to the questions which would clutter the feedback and would sometimes derail the conversation.” – GP4

Other Findings

Privacy Concerns in Sharing Patient Information

An issue became apparent when GPs want to share patient information online with other GPs. The need to have the patient permissions to do so due to privacy concerns and taking full responsibility in conveying the said diagnosis.

“It takes full responsibility we don’t have the permission of the patients of course, im just a bit phased down about this” – GP3

GPs shared a concern when knowing why the patient is in a particular condition after diagnosis, patients sometimes request to schedule with a person of ‘authority’ especially when the diagnosis concluded in taking medication.

“Or the other thing is there is always this guy you know what you want to do, but the patient is reluctant to say to send them across to someone with authority” – GP5

Discussion

Our findings suggest that the proposed design and role considerations can assist in designing a Health VCoP for HPs CPD HPs from a tools perspective. The two HP focus groups cast light on the intricacies of how HPs seek their CPD knowledge. GPs were quick to agree with each other on what they shared in the focus group. For example, if one answered the others rarely disagreed. This dovetails with the notion that participants in focus groups tend to build on other participants’ ideas and agree with each other on their learning and thought processes (Wilkinson and Silverman 2004). To the best of our search in the literature, until now, no known study had looked into the perceptions and ideas of senior GPs for Health VCoPS and certainly not for CPD as only a recent study provided by Barnett et al. (2014) looked in-depth into GP trainees in a Health VCoP for knowledge sharing and reducing professional isolation.

Rich Profile Information

With regard to the development of a rich profile, GPs who were willing to be involved in an online community for their CPD, usually have had past experience in using online communities already (such

as a Facebook group called “GPs Down Under”) Those who had never joined an online community wanted more of a justification to join in having participants show their credentials and achievements to justify spending time and effort in using a Health VCoP for their CPD. This justification has previously been explained in the business literature where we find employees want to see credentials, achievements, etc, to justify participating in VCoPs (Wasko and Faraj 2005).

Platform Navigation

GPs agreed that having an easy-to-use platform would help in easing the process of learning and knowledge sharing in the Health VCoP giving examples such as Facebook’s “GPs Down Under” group as having an easy-to-use interface and layout that seems easy to navigate. Adding the ability to have the Health VCoP accessible via app, mobile phones, iPads, or any other form of mobility technology would give them more incentive to use the Health VCoP on their way to work and/or home. HPs able to use VCoPs for their CPD through some form of mobile technology can help in virtual collaborative situations for their clinical practice and educational goals (Boulos et al. 2006).

Diverse Community

GPs welcomed the idea of a diverse community by having a specialist involved in the Health VCoP as it adds diversity to the community as well as having a recognizable and knowledgeable source that is able to partake in discussions in correcting any erroneous information if any were passed around in the Health VCoP. This notion can also help in GPs in finding a solution to problems without hesitating in diagnosing patients and sending them off to a specialist when in doubt. The difference in learning and knowledge sharing methods by the GPs and specialist can help in benchmarking each other’s knowledge (Barnett et al. 2014). Where GPs learn by face-to-face communication, sending emails to colleagues, and searching online resources, a specialist tends to learn mostly by case studies; and converging both experiences together can have a profound effect on both parties for benchmarking their own knowledge.

Rich Contextual Content

Quality of content is of utmost importance where GPs insisted that if the Health VCoP lacked quality of content then they would most likely seek other avenues for their information either through their colleagues or searching online from their own resources. This is compounded by the fact that GPs now have a plethora of websites to go to for their learning and knowledge acquisition which can result in taking more of their precious time in diagnosing patients by searching the Internet for their answers. Quality of content must be significant for HPs in general to incentivise them to return and participate in the Health VCoP (Lara et al. 2016; MacWalter et al. 2016).

Human Roles

Facilitation of the Health VCoP is important for its success (Barnett et al. 2014) as one GP mentioned that the only problem with the current online group she is in (“GPs Down Under”) were sarcastic answers sometimes given to other GPs posting and derailing the conversation altogether. Resources should also be moderated and filtered by facilitators to only provide the most relevant content possible to participants involved.

Privacy Concerns in Sharing Patient Information

Our other findings were a result of the open discussion among GPs sharing their insights on issues when trying to share knowledge in a Health VCoP environment. Gaining permission from patients to share their knowledge online is a major drawback to the idea of a VCoP in general. An example would be having a patient with a very rare disease that is identifiable even with anonymising each detail of the patient but due to the rarity of the condition, can still be identified to other GPs especially when they are all from the same city and/or region. This can be mitigated by providing a template for case study submission as in a previous study by Sharma et al. (2006). However, details of anonymising patient information hadn’t been reported as it depends on the online social network involved. Another concern is having a patient demanding an “authoritative person” from the GP (although giving the right diagnosis) when given advice related to using medication, as the patient hopes that the specialist would give another option to opt-into and has more experience than the GP in the field.

Limitations

A limitation of this study is that it was conducted with a group of senior GPs excluding any junior GP or GP trainees. Furthermore, to illustrate how time poor GPs are due to the nature of their work, both focus group sessions were 30 minutes each as it was a great task to gather all participants at the same time in one sitting as evident from the three-month period between each focus group session and justifying sending out a questionnaire with questions to get some personal responses. Furthermore, some senior GPs in each focus group (9 out of 14 GPs from Table 1) were already engaged in some sort of online learning courses (i.e. e-learning in virtual communities, CPD through specialised websites for accreditation points, etc.), which may result in a bias result towards more involvement in a Health VCoP for their CPD.

Conclusion

This paper presents a qualitative case study of HPs' perception on using a Health VCoP for their CPD. The collection of data was an attempt to confirm the necessary design considerations for a Health VCoP for CPD. The analysis of the qualitative data has provided more insight into the intricacies of how a targeted health profession, in this case GPs, want to learn and share knowledge in a Health VCoP for their CPD. From using our conceptual model in deriving questions to question the GPs, we were able to identify if the design and role considerations we had put forth are worthy to focus on when designing and developing our Health VCoP CPD prototype. These design and role considerations were: Rich Profile Information, Platform Navigation, Diverse Community, Rich Contextual Content, and Human Roles.

Theoretical implications from this study will extend our conceptual model to include new findings as a novel construct termed "Patient Information Anonymisation" will be implemented in designing and developing our Health VCoP for CPD purposes. Furthermore, it can be used as an evaluation metric for any current and/or new Health VCoPs that seek to sustain learning and knowledge sharing. Thus, providing a rich profile establishes identity to each participant, which would provide more meaning and incentives in returning to the Health VCoP to be congruent with like-minded participants. This notion can reduce abstract and uninteresting experiences between participants as each participant has had a unique experience. Gaining their own knowledge and sharing it would enrich the domain of a Health VCoP. A diverse community of HPs would help increase innovative ideas and knowledge based on their own unique experiences and sharing it with their peers in the community. This idea helps in increasing the rich contextual content from real-life experiences from all HPs other than only knowledge from evidence-based practice medicine research. Furthermore, a rich contextual content would increase HPs practice about the Health VCoPs' specific practices such as methods learned from peers and daily practice to provide better patient management for a specific ailment. Finally, easy navigation through the Health VCoP would help HPs to access the necessary tools and information, which will for example, assist HPs in attaining knowledge with ease and ultimately provide improved patient outcomes.

Practical implications include having a new avenue of CPD for HPs via Health VCoPs which can help HPs who are located in rural and remote areas around the globe. A well designed VCoP can save time for HPs who are time-poor to begin with in providing a concise, efficient, and effective learning platform for their learning and knowledge sharing endeavors for their CPD.

Currently, a pilot study has been initiated to design a prototype for a group of HPs in using a Health VCoP for their learning and knowledge sharing in a specialised environment. Human Ethics approval has been granted to enlist a group of HPs to gain feedback on the design of a Health VCoP prototype and then launch the prototype and invite HPs to participate in the Health VCoP. This paper reports on the findings, which had already been used in guiding external developers to design the Health VCoP prototype for HPs' CPD. Hence, we are underway in recruiting HPs in testing the Health VCoP and we will be conducting single semi-structured interviews with them.

Next steps for future work include: initiation for recruiting HPs to use the Health VCoP for learning and knowledge sharing in this specialised environment; observing learning and knowledge sharing in this Health VCoP; and conducting post-interview formal and informal sessions with participants for re-evaluation, enhancement, and validation of our initial and improved design and role considerations for a CPD Health VCoP.

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