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Information encountering on social media and tacit knowledge sharing

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Abstract
The purpose of this paper is to investigate how social media may support information encountering (i.e., where individuals encounter useful and interesting information while seeking or browsing for some other information) and how this may lead to facilitation of tacit knowledge creation and sharing. The study employed a qualitative survey design that interviewed twenty-four physicians who were active users of social media to better understand the phenomenon of information encountering on social media. The data was analysed using the thematic analysis approach. The study found six main ways through which social media supports information encountering. Furthermore, drawing upon knowledge creation theories, the study concluded that information encountering on social media facilitates tacit knowledge creation and sharing among individuals. The study provides new directions for further empirical investigations to examine whether information encountering on social media actually leads to tacit knowledge creation and sharing. The findings of the study may also provide opportunities for users to adopt social media effectively or gain greater value from social media use.

1. Introduction

Social media tools such as blogs, micro-blogs, wikis, and social networking sites have greatly changed information seeking behaviour of individuals. Several studies [1-4] now argue that these tools provide more opportunities for information encountering, a type of information seeking behaviour that refers to finding useful and interesting information unexpectedly while seeking or browsing for some other information [5]. Distinctive features of social media such as openness, availability, network effect, user-generated content and harnessing collective intelligence appear offering more opportunities for individuals to encounter new information and knowledge [6].

The information exchanged among individuals on social media is usually articulated, therefore, it might be argued that information encountering on social media mostly facilitates sharing of explicit knowledge (documented and articulated knowledge). However, based on Nonaka and Takeuchi's [7] knowledge creation theory it can be argued that information encountering on social media may also facilitate tacit knowledge sharing (the knowledge that resides in human minds that cannot be easily verbalised, e.g., ideas, rule of thumbs, technical skills, and intuition). According to Nonaka and Takeuchi, tacit knowledge creation relies not only on personal experiences and knowledge acquired at the workplace, but also depends on the availability and adequate consumption of existing knowledge and information. The increased interaction with existing knowledge provides more possibilities for internalising the assimilated knowledge which then establishes more opportunities for creating new tacit knowledge.

Since Nonaka and Takeuchi [7] proposed knowledge creation theory and explained how explicit knowledge might be converted to tacit knowledge by reading explicit materials, reflecting upon, applying, and practicing that accumulated

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knowledge in context, very few studies have discussed the role that encountering with existing explicit knowledge plays in new tacit knowledge creation. In particular, information encountering on social media and its potential for tacit knowledge creation and sharing has been rarely addressed in the literature. It has been argued that, compared to traditional information and communication technologies (ICT), social media has more potential for increasing the visibility of published information and also triggering sociality and informal communication among individuals which may lead to unexpected discovery of useful or interesting information and hence facilitating tacit knowledge creation and sharing [8].

Therefore, this study aimed at identifying the ways social media may help tacit knowledge creation and sharing among physicians by providing opportunities for information encountering and maximising interaction with existing explicit knowledge. In other words, this study addresses two research questions: first, how social media may provide opportunities for information encountering and second, how these opportunities may facilitate tacit knowledge sharing among physicians.

Tacit knowledge sharing among physicians, such as the sharing of clinical experiences, skills, know-how, or know-whom, is known to have a significant impact on the quality of medical diagnosis and decisions [9-11]. The study argues that information encountering on social media may facilitate tacit knowledge sharing among physicians who may not always be physically co-located but exchange their experiential knowledge.

Information encountering in this study is defined as the ways through which the participants may find new information or obtain new knowledge unexpectedly as a result of interacting with peers, reviewing Twitter or blog updates, or while searching for specific information on social media sites. This also covers mechanisms that enhance the visibility and availability of existing knowledge which then increases the participants' encountering more information. Several authors [12-14] also argued that information encountering is not only about finding unexpected information but also about making unexpected connection between different pieces of information, people, ideas, and resources. However, this was out of the focus of this study but could be a theme for future studies.

The remainder of the article is organised as follows. First, an overview of the literature review and related works are provided. Next, the methodology used in the article is explained. Then, main findings of the study are presented. Finally, the article concludes with a brief discussion of the study findings and providing directions for future research.

2. Literature review

2.1. Information encountering

The concept of information encountering was first introduced by Erdelez [5]. She defined information encountering as serendipitous information discovery or "bumping" into useful or interesting information while seeking or browsing for some other information. Based on this definition, information-rich environments such as libraries and internet appear ideal for information encountering [5]. With the advent of social media tools such as blogs, micro-blogs, wikis, and social networking sites, several studies demonstrated that compared to traditional ICT, these sites provide more opportunities for experiencing information encountering.

For example, by analysing transaction logs of a Chinese well-known social tagging system, Douban, based on an original clickstream data analysis framework, Jiang [1] found encountering as one of the top three popular as well as effective information seeking strategies adopted by users who use social tagging systems. Conducting semi-structured interviews with 15 postgraduate students, Dantonio, Makri, and Blandford [2] explored whether social media tools facilitate serendipitous encountering in the academic domain. Their study revealed that information encountering was experienced widely among users of social media and the likelihood of experiencing information encountering is increased by investing time for browsing and searching information on social media and the strong sense of reciprocity in other people's actions. Employing a mixed-method research design, Lu [3] explored characteristics of accidental discovery of information on web-based social tools. She argued that social media tools serve as information grounds that foster information encountering by providing more opportunities for users to gather together in a virtual space, establish relations, and share useful information. She characterised information encountering on social media by identifying six elements of user, motivation, context, information behaviour, information, and information need. More recently, McCay-Peet, Toms, and Kelloway [4] also surveyed 289 professionals, academics, and graduate students to understand whether digital environments have the potential to facilitate information encountering. They found that social media sites support information encountering more than traditional tools such as databases, search engines, or intranets by connecting people to other people with interesting ideas and information.

The concept of information encountering has been rarely investigated in healthcare context. Most previous studies focused on investigating information seeking behaviour of healthcare professionals in online environments. A few observed that internet may also help healthcare professionals and patients to encounter more information. For example, Rubenstein [15] using an ethnographic approach found that patients using an online breast cancer community encountered more knowledge and this influenced their medical treatment decisions. Palsdottir [16] also in a survey found that using internet (discussion/news groups, online journals/newspapers, health related websites, and Internet advertisements) helped Islanders to encounter more information about health and lifestyle in everyday life.

Most previous studies investigated information encountering on social media by adopting information seeking behaviour or social learning theories. Very few of them explored qualitatively how and through what mechanisms social media may facilitate information encountering. In particular, the link between information encountering on social media and tacit knowledge sharing theories was rarely addressed in the literature.

2.2. Tacit knowledge

Tacit knowledge was defined in knowledge management literature as knowledge that is highly personal and difficult to articulate completely, compared to explicit knowledge which is well articulated and written down [7]. Examples of tacit knowledge include technical skills, know-how, know-whom, ideas, rule of thumbs, intuition, and lessons-learned. Traditionally scholars viewed knowledge as a dichotomy of tacit versus explicit knowledge, and hence, they did not see much role for information technologies in facilitating tacit knowledge sharing [17-20]. However, many researchers currently intend to view knowledge as a continuum of tacit-to-explicit knowledge [20-22]. Therefore, they believe that information technologies can easily contribute to facilitate sharing of knowledge with a low to medium degree of tacitness, also called implicit knowledge or articulable tacit knowledge [23-28]. Despite this, there is a major debate ongoing among researchers about whether information technology can have a role in tacit knowledge sharing among individuals [8].

The theory that explained interaction with existing explicit knowledge and its potential in creating new tacit knowledge was first introduced in Nonaka and Takeuchi's [7] knowledge creation model, also known as SECI (standing for Socialization, Externalization, Combination, and Internalization). This model presents four continuous processes for knowledge sharing and tacit-explicit conversions: socialization, externalization, combination, and internalization.

Socialisation describes the conversion of tacit knowledge into a tacit form, involving the creation and exchange of new knowledge through shared experiences, hands-on experience, empathising, and participating in an informal social meeting. Externalisation indicates the conversion of knowledge from tacit knowledge to an explicit form, involving crystallising and articulating tacit knowledge into explicit knowledge. Combination is the process of converting explicit knowledge into other systematised explicit knowledge. Finally, internalisation deals with the process of converting explicit knowledge into tacit knowledge through reading explicit materials, reflecting upon, applying, and practising that accumulated knowledge in context.

Information encountering could be regarded as part of internalization process. Internalization was defined by Nonaka and Takeuchi [7, p.69] as "the process of embodying explicit knowledge into tacit knowledge" through learning by doing and also through reading explicit knowledge. In other words, Nonaka and Takeuchi implied that consumption, assimilation, and reflecting upon the existing explicit knowledge may lead to further internalization and conversion of explicit-to-tacit knowledge.

Since Nonaka and Takeuchi [7] first proposed their theory, very few studies have discussed the role that encountering with existing explicit knowledge plays in new tacit knowledge creation. The only study that was found briefly discussing the role of existing explicit knowledge in creating new tacit knowledge was Raisanen and Oinas-Kukkonen's [29] study. They argued that browsing, organising, and playing with existing knowledge helps to identify problems, needs, and opportunities, which establish foundations for the comprehension and deeper understanding of the knowledge shared and therefore, provide opportunities for embodying tacit knowledge.

Both Nonaka and Takeuchi's [7] and Raisanen and Oinas-Kukkonen's [29] studies concentrated mainly on representing knowledge conversions and creation processes in their conceptual models. Technological contribution to tacit knowledge creation through increasing the interaction and encountering with existing knowledge was not the focus of their studies. In addition, none of these studies discussed the mechanisms that may help to increase interaction with existing explicit knowledge. Therefore, this study attempts to identify how social media may facilitate information encountering and then discusses how these processes may facilitate tacit knowledge sharing by adopting tacit knowledge sharing theories.

2.3. Healthcare use of social media

The use of social media platforms by healthcare professionals has grown considerably in recent years [30-32]. There are numerous examples of social networks developed specifically for use by the medical community (e.g., Sermo, Ozmosis, and Medscape) with each having more than 100,000 members. A survey by Griffis et al. [33] in 2014 showed that majority of US hospitals (95%, N:3371) have a presence on at least one social media site, with more than 50% having either a Facebook page or Twitter account, and more than 99% having either a Yelp page or being active on Foursquare. Kung and Oh [34] in 2014 also reported that 94% of US nurses (N:410) use social media. They were more interested on using social networking sites (90.33%), podcasts (76.24%), social question and asking sites (37.86%), blogs (31.85%), and Twitter (19.06%). Similarly, a study by McGowan et al. [31] in 2012 revealed that nearly 60% of U.S. physicians perceived social media as a useful, engaging, and good means to receive the latest and high-quality medical information, and they believed that social media enabled them to practise more effectively.

Adoption of social media in other countries is also growing. Investigating social media use by UK plastic surgeons (N:323), Mabvuure et al. [35] in 2014 reported that more than 82% of them were on at least one platform including LinkedIn (52%), Twitter (22%), and YouTube (15%). A Survey in a medical university in Turkey in 2015 also showed that near to 90% of medical students used social media for professional purposes [36]. Antheunis, et al. [32] in 2013 also found that Dutch physicians use primarily LinkedIn, Twitter, and YouTube for professional purposes. Conducting a content analysis on twitter messages by five prominent organisations in surgery, Ralston et al [37] in 2014 also indicated that surgical colleges have considerably improved their international reach through social media either for communicating about education/training opportunities or discussing on patient-related matters.

The use of smartphones and tablets, which are known for providing easy and instant access to social media tools, has also increased considerably among medical community around the world. According to Manhattan Research [38] in 2012, above 70% of physicians in developed countries used a smartphone, and near to 60% used a tablet for professional purposes.

While several studies have highlighted the increasing use of social media by healthcare community, very few studies have been conducted to explore the potentials and shortcomings of these technologies in regard to the specific information needs of medical communities, particularly in relation to tacit knowledge sharing through social media. The current research is aimed at filling parts of this knowledge gap by seeking physicians' viewpoints and experiences regarding the potential contributions of social media in facilitating tacit knowledge sharing through providing a space for information encountering.

3. Methodology

Adopting a qualitative survey design, twenty-four physicians were interviewed using a semi-structured interview method. A survey is qualitative when it uses qualitative data collection and analysis methods, instead of statistical quantitative methods, to explore knowledge, opinions, and meanings that people assign to their experiences [39].Qualitative survey is a simple research design that looks for studying the diversity of some topic of interest in a population and conceptualising the common essence [40]. The purpose of qualitative survey is to provide "depth and uniqueness rather than breadth and representation" [39, p.68], which is also the case in the current study. Therefore, it was deemed that this method can provide opportunities for an in-depth understanding of physicians' perspectives and experiences regarding information encountering on social media.

Physicians were chosen as the study population because of the fact that they are working in knowledge intensive environments and their need to new knowledge is vital for improving the quality of patient care. Although the adoption of social media by physicians has increased considerably in recent years, little has been done to investigate their perspectives and experiences of using these tools [41].

Employing a snowball sampling method resulted in recruiting participants from different geographical locations including Australia (thirteen participants), United States (nine participants) and a few from Europe (two participants). Only physicians who used social media regularly – at least twice a week – and also those who have had at least five years clinical experiences were recruited for the study. This ensured that that the participants have sufficient experience (both on social media and also in workplace) to comment about using social media for knowledge sharing.

Online video calling program (Skype) was used for conducting the interviews. A number of open-ended questions as well as some probing questions were asked from the study participants to describe what social media tools, why, and how they used them to share their knowledge and information. Participants were also asked to provide several examples of when they used different social media tools to share professional and work related knowledge. The average interview

time was about forty minutes. All interviews were audio recorded, transcribed, and entered to a qualitative data analysis program, NVivo (version 10), to manage, code, and analyse the data.

Thematic analysis approach was used to analyse the interview data, following the guidelines provided by Burnard [42] and Braun & Clarke [43]. The analysis involved a careful reading of the transcripts, performing an initial open coding, reviewing the codes multiple times, comparing the codes with each other and also against the data, grouping the codes according to content similarity as well as their theoretical links to tacit knowledge sharing concepts (in particular, their relation to internalization processes in SECI model), and finally choosing and reporting the main overarching themes responding the research question.

Trustworthiness of the data collection and analysis was achieved by sending a copy of interview transcripts to the participants to check and edit, keeping and systematically reviewing the detailed records of the data analysis process including decisions made throughout the project, reviewing the process and findings by supervisory team, and also presenting and discussing it with colleagues.

4. Findings

The study found that, as perceived by the majority of the study participants, social media has a much greater ability to increase information encountering in comparison to traditional media. The data showed that social media facilitated participants' encountering existing knowledge in a number of ways, which constructed the centre of this study.

Six major themes associated with information encountering in social media were identified as the following: broadcasting and publicising information to a wider audience, faster dissemination of information, personalised and filtered information feed, keeping up-to-date, documentation of knowledge and experiences, and retrievability. They all help existing knowledge and information to become more available to the clinical communities, hence increasing the chance of creating and sharing new tacit knowledge.

A detailed discussion of each theme is provided in the following sub-sections.

4.1. Broadcasting/publicising information

The study participants stated that social media has great potential for increasing information visibility and encountering by providing an opportunity to broadcast and publicise information and knowledge. Social media has the potential of getting in touch with larger audiences, and also offers services such as auto posts, tagging, links, subscribing, and news feeds. These all provide better opportunities for publicising information and knowledge compared to traditional ways of disseminating information. As one of the study participants observed:

> It's a good place for advertising what you do elsewhere. Like if you just write a blog and don't tell anyone, no one is going to read it, whereas if you publicise it on Twitter people will look at it (Participant no. 2).

Social media allows information to circulate virally among much larger communities from all over the world. According to the study participants, the maximum people who read your paper or hear your presentation in a traditional method is fewer than one or two hundred, while on social media, your potential audience is a million. A wider audience significantly affects the speed and the reach of information dissemination. This increased chance of information encountering then also provide more opportunities for medical community to create and share tacit knowledge.

Broadcasting blog posts, presentations, journal papers, and live tweeting of conference highlights via Twitter were common among the participating physicians. Social media provides easy access to the print world. It is a good place to advertise and highlight studies or works that have been published somewhere else. It drives traffic toward already published material. It also provides an opportunity for pre-publication review by peers before they appear in hardcopy. A participant shared his experience of publicising his own publication on social media as follows.

> I write for EP-Monthly and I write occasionally for Medscape and I do some peer reviewed articles as well and I try to use social media sometimes to highlight these articles and drive traffic toward them so that we can foster a discussion (Participant no. 13).

Social media creates a cycle of information by providing links to information published via other means, be it online or in print. The majority of participants viewed this as one of the great advantages of social media in that it brings information to you that you perhaps would not have known about or found otherwise.

Broadcasting on social media among physicians is not just limited to already published materials. Participants also talked about sharing other types of knowledge such as particular clinical skills, tips, ideas, and thoughts which had

become popular as a result of sharing on social media. These conversations are usually great sources of tacit knowledge and social media facilitates sharing of these valuable information and knowledge by providing opportunities for broadcasting and publicising them among the participants.

4.2. Faster dissemination of information

Faster dissemination of information is another advantage of social media mentioned by the study participants that has the potential to increase the chance of encountering new knowledge and information. The majority of the participants believed that social media makes information and knowledge easily and readily available to the community, compared to traditional mechanisms of publication which always have a long delay from few months to several years. They talked about how they liked the speed of information sharing on social media through having a worldwide reach. For example, a participant stated that,

I like the being able to get information out very rapidly … I really like the worldwide reach (Participant no. 16).

Participants appreciated the immediacy of social media, the immediate availability of comments and tweets, and also the ability to view articles even before they get published as a result of discussion with the authors of the articles. For example, a participant said,

The main thing … is the immediacy of the social media world. So the fact that I can see an article that's not yet in print and immediately read it (Participant no. 12).

Participants provided several examples of how social media exponentially accelerates knowledge and information sharing among physicians. For example, a participant talked about a specific clinical technique that had taken several years from its initial publication in a journal to become best practice, whereas Scott Weingart's technique, for example, which was published on his blog with supporting multimedia elements, became widespread within weeks and was incorporated into the practice of many clinicians in a short time.

Although Weingart had already published his paper in a journal, it had not received much attention. The reason, according to the participants, was that the majority of practitioners do not read many of the scientific journal papers. They are not interested in spending time and paying money for a basic science journal that may or may not matter to them. Instead, they use Twitter and RSS feeds as main sources of information. They subscribe to the social media feeds of important journals in their field, such as the *New England Journal of Medicine, BMJ*, or *JAMA* and if they find an interesting article, they then follow the links. In addition, the new format of information sharing on social media allows for interactive communication among sharers about the content shared, and this was not possible in the traditional format.

An example of a participant's comment on how social media is more effective than traditional journals is provided below.

It's on your phone … it's an easy way to stay up-to-date with information rather than the stack of journals that I have sitting at home collecting dust because I never really have time at home to read through all the journals (Participant no. 17).

According to the participants, faster dissemination of information is vital in the medical field. If you hear about a solution in a week versus two years from now, several patients' lives potentially might be saved in the interim. Information is time dependent and becomes fairly irrelevant quickly if it is not disseminated in an appropriate amount of time. Unlike a journal that comes out once a month, social media is updated 24/7, 365 days a year, which means that it almost provides real-time information. It can be argued that in a traditional academic publication, if information becomes visible to the user in two or three years from its early draft, the information on social media moves on a minute, hourly, or daily basis.

In addition, social media not only helps faster dissemination of already published information, but also helps faster publication of new information. Sharing information on social media simply starts by just creating a new account and is accessible and achievable for anyone compared to the traditional methods which were regarded by participants as expensive, cumbersome, time consuming, and suffering from long delays.

4.3. Personalised and filtered information feed

Another advantage of social media that participants were very interested in was the personalised and filtered information feed. Information anarchy is one of the main challenges of online information, particularly if it is published on social media [41]. Participants viewed seeking information individually and sieving relevant from irrelevant information as a quite time consuming effort. No one can read and evaluate all journal papers. However, social media serves like a journal club for physicians who participate in social media in which everyone who has read something new and important shares it with other colleagues immediately. Indeed, it works as a platform for a collective reading and evaluation of the literature. The following two interview excerpts illustrate how social media helps physicians by providing personalised and filtered information feeds.

> The fact that it's filtered by experts or other enthusiasts who have similar objectives to you means that it tends to be things that actually appeal to you more or are more useful than just trawling blindly through other resources, traditional resources (Participant no. 15).
> What I like looking both at Twitter and other people's blogs are mainly just because there's so many articles being published every week I kind of use Twitter as a filtering device to see what people are talking about and which articles I should pay closer attention to (Participant no. 17).

As the above examples demonstrate, social media helps physicians to determine what is the most important and valuable information to read, according to their colleagues' viewpoints. Social media tools such as Twitter and blogs have features that enable users to define exactly who and what resources to follow and these serve as a way of screening vast amounts of information available on the Internet for physicians.

Access to information which is already evaluated and filtered by experts or other enthusiastic colleagues ensures that the information shared is relevant, high quality and peer reviewed. Peer review in social media, according to the participants, is "rapid and potentially brutal". This means that if something incorrect is shared on social media, it will receive strong responses in a short time. This prevents sharing the wrong information among the community. Accordingly, trust is an important factor in choosing who to follow. Therefore, creating a list of trusted people on a given topic is necessary in social media interactions.

4.4. Keeping up-to-date

Keeping up-to-date is one of the most important challenges that physicians face in their profession [44, 45]. Today, information travels faster than ever before and clinical practice is constantly evolving. The ability to keep track of the latest information and developments is important in clinical practice. Social media is regarded by the study participants as one of the most effective ways to keep abreast of what is happening internationally in the field. The majority of participants believed that social media exposed them to more up-to-date information, which resulted in obtaining more knowledge.

Participants stated that they were checking their Twitter accounts or RSS feeds regularly to view headings and summaries of information shared by their trusted colleagues and sources. Twitter and RSS feeds indeed serve as a kind of alert system for newly published material. As soon as a new journal paper, a blog post, a presentation, or an interesting tweet is shared by pre-selected sources, they will appear in the user's account. The user can then review and decide to read the details of the materials of interest.

Participants acknowledged that prior to the use of social media, their ability to obtain new knowledge was limited to local colleagues and a few journals if they could find the time to read them. However, their ability to incorporate new knowledge had exploded since entering the social media world. Examples include being able to quickly review newly published literature and controversial topics, being informed of new evidence, techniques, and advances, being able to engage in professional conversations, or just reading people's opinion and comments. From the participants' perspectives, physicians who use social media regularly are much more up-to-date than physicians who do not use social media. The following interview extract shows an example where a participant compared herself with her colleagues who do not use social media.

> I can now very much notice there's a big difference between myself and my peers who are of a similar vintage who don't use social media by far. I am always up-to-date with the latest stuff and they're not now ... It's not because I spend lots of time studying and reading it, because I'm just now awash with this conversation going on (Participant no. 11).

There were also examples where participants believed that social media assisted them to be a better physician, that their understanding of clinical practice in an emergency department was much more developed due to their participation in the discussions on social media and becoming more up-to-date.

> I think it makes me a better physician for a number of reasons. I think I'm much more up-to-date than I otherwise would be … I believe I have access to a greater pool of expertise than I would … I think that my understanding of things like risk management in the emergency department and … are much more developed (Participant no. 12).

In addition, the social aspects of social media motivate physicians to read much of the literature to keep up with others. It also creates commitment and encourages the participants to contribute more to the community in order to be in the circle. This is well illustrated by Participant no. 23 as the following extract shows.

> The social aspect of it makes me want to read up more on the standard journals as well because you meet people with a lot of knowledge and you want to give that back and you want to read more about what they are talking about or asking you about (Participant no. 23).

4.5. Documentation of knowledge and experiences

Tacit knowledge needs to be documented when it is articulated and converted to explicit knowledge [46-48]. Tacit knowledge is articulated when it is crystallised and converted to explicit and readily understandable knowledge. Tacit knowledge can be articulated using several methods such as dialogue, storytelling, metaphors, analogies, annotations, and demonstrations. Once tacit knowledge is articulated either in an oral, written, or visual format it needs to be stored for future use or for further discussion [46, 48-50]. Otherwise, that valuable tacit knowledge will be lost or will remain shared between a limited numbers of people with no benefit for others.

This study found that, as observed by a number of participants, social media is also helpful in documenting articulated tacit knowledge. Indeed, one of the main reasons of using social media tools by physicians was to document and store their professional experiences, lessons learned, or some important information they found in the literature. They mentioned that they were using social media tools, mainly blogs, like a personal notebook to write down and store their particular findings or thoughts in order to use them in the future by themselves or to share with other physicians to develop discussions about them.

Two examples of participants' views regarding documenting tacit knowledge on social media are provided below.

> Me and my colleague who writes our blog, we mainly use it to sort of document our own stories and to keep it as a base for what we've learnt and experienced and found (Participant no. 23).
> It also helps me in archive times ... if I have taken the time to research something and review something then I'll be able to store that Information on the blog post ... I can then go back to that. I can hit that links to somebody else ... (Participant no. 1).

Although blogs were used as the main tool to document knowledge and experiences, participants mentioned using other tools such as wikis, podcasts, and YouTube to store and share their knowledge. It can be argued that these social media tools serve as repositories of tacit knowledge that has been articulated, communicated among participants, and archived there almost permanently.

A variety of formats such as text, photo, audio, and video are used to document knowledge and experience on social media. Examples of documenting tacit knowledge in a text format included particular tips, personal ideas, and professional opinions written down during chats and discussions in the Twitter sphere, or the comments written about a blog posts, or a vodcast/podcast shared on a multimedia media site. Sharing clinical images such as x-rays, ECGs, and ultrasound images, sharing audio files of discussions between experts on podcasts, and sharing recorded videos of performing practical procedures and skills in multimedia channels were other formats of storing tacit knowledge in social media space.

The key advantage of storing information and knowledge on social media sites is that they are archived there almost permanently. As one of the participants stated, "*it's all there and accessible and archived*" (Participant no. 12). The permanent storage of contents on social media is followed by permanent availability to a wider audience which is another advantage of storing information on social media. The permanent storage and availability of social media contents allows users to revisit the content shared as many times as they want. This helps users to refresh their memory or learn something new each time they visit, according to the participants. Although the participants believed in the permanent storage of information on social media, it is worth mentioning that social media sites are not obliged to

permanently archive the contents shared on their sites and this might create a problem in the future given the importance of the information being exchanged by the participants.

As far as articulating tacit knowledge is concerned, it has to be noted that definitely not all parts of tacit knowledge are codifiable and hence storable on social media. Every attempt to externalise tacit knowledge and convert it to explicit knowledge is accompanied by losing some of its distinctive properties. However, the interactivity and social aspects of social media allow for ongoing discussion and questioning about any ambiguous parts of the knowledge shared.

Documenting knowledge might be regarded as the final stage of the tacit knowledge sharing process as at this stage it is articulated and converted to explicit knowledge. However, viewing knowledge as a continuum of tacit-explicit rather than a dichotomy of tacit versus explicit knowledge [51-54], it can be argued that the tacit dimension of some of the documented tacit knowledge, particularly that which is archived in chats, conversations, videos, and also that which is maintained in relations, is still stronger than its explicit dimension.

4.6. Retrievability

Retrievability of articulated knowledge (tacit knowledge that is just converted to explicit) was also mentioned as another advantage of social media. Once tacit knowledge is codified and converted to a written format it is easily possible to retrieve it on social media. Social media contents are public and can also be searched using popular search engines such as Google, Yahoo, and Bing. In addition, tagging is a great way to organise and enhance the retrievability of contents shared in social media space. For example, participants adored the use of hashtags (e.g. #hcsm, standing for topics related to healthcare and social media or #FOAMed, standing for Free Open Access Medical Education) to tag their tweets with searchable and personalised keywords on Twitter. The hashtags enable both followers and non-followers of a given topic or account to easily search and follow topics of interest on Twitter.

The following interview excerpts show examples of participants' views in regard to the searchability of social media tools.

> Twitter has improved their searching and because you can search locally and because you can have these hash tags, I find it's really great at conferences and really great for conversations on a specific theme (Participant no. 13).
> [Blogs] are searchable forums so that if you want to go back and read something later on or if you need to refresh your memory blogs are the best way to do it (Participant no. 18).

As the above examples show, social media tools provide opportunities to search articulated tacit knowledge on a specific topic either by employing personalised tags or through popular search engines. As a result, the chance of encountering new information and knowledge increases among users.

5. Discussion and conclusion

Information encountering is mostly about explicit rather than tacit knowledge sharing. However, as Nonaka & Takeuchi's knowledge creation model [7] and Polanyi's [55] argument of interaction between focal (explicit) and subsidiary (tacit) awareness imply, tacit and explicit knowledge have an interactive relationship such that the creation of one depends on the other. That is, interaction with existing explicit knowledge and exposure to information from various perspectives and sources are essential for creating and capturing new tacit knowledge [27, 29, 56]. Increased interaction with existing explicit knowledge may then facilitate the internalization and creation of new tacit knowledge. In other words, the more existing knowledge is available and visible for knowledge seekers, the more cutting-edge ideas and tacit knowledge might be created and shared.

The current study confirmed Nonaka and Takeuchi's [7] and also Raisanen and Oinas-Kukkonen's [29] arguments that information encountering is essential for tacit knowledge creation. However, the study investigated it from a technological perspective and, further, it explored the mechanisms that facilitate encountering and interacting with existing knowledge through the use of social media tools.

The study argues that social media increases the availability and visibility of existing explicit knowledge and therefore, it increases participants' encountering with existing explicit knowledge. In this case, social media does not support tacit knowledge sharing directly. Instead, it first facilitates explicit knowledge sharing by increasing the chance of encountering new information and knowledge, and then individuals who consume that knowledge may assimilate and incorporate it with their prior knowledge and experience in order to make new tacit knowledge. In other words, the more people encounter new explicit information on social media the more new tacit knowledge they may create.

The study demonstrated that social media has increased participants' encountering existing knowledge through several ways that have not been addressed in the literature. For example, it found that social media provides better opportunities for broadcasting and publicising already published information and has great potential for faster dissemination of information due to large audience and social network effects. It provides a more personalised and filtered information feed for participants. It constantly keeps participants up-to-date. Finally, it provides simple and quick ways to document personal experiences and knowledge which are also easy to share and also to retrieve.

The potential link between tacit knowledge sharing and those features of social media that increase the chance of information encountering has not been clearly identified and discussed in the literature. These were all new findings that the present study revealed and then connected with tacit knowledge sharing concepts. From the all dimensions identified in the study for information encountering on social media, knowledge documentation and storage has been adequately addressed in the knowledge management literature. However, very few studies exclusively discussed the documentation of tacit knowledge.

For example, Palanisamy [46] stressed that organizations require proper documentation of tacit knowledge for later use or retrieval. He calls for further research to develop innovative techniques for documenting tacit knowledge. Selamat and Choudrie [47] also argued that externalised knowledge, ideas, and thoughts need to be documented. Wang and Qiu [48] found that the documentation of tacit knowledge (capturing and converting tacit knowledge to explicit) was one of the most effective strategies to leverage tacit knowledge sharing in the organization.

In regard to technological contributions to the documentation of tacit knowledge, knowledge management systems have been regarded as facilitators to document best practices and lessons learned [57, 58]. A few studies also showed that blogs [59] and multimedia formats (in particular, video storytelling) [60] are effective media for documenting personal experiences.

By seeking physicians' perspectives and experiences on social media, this study found that social media also helps tacit knowledge sharing through enabling documentation of tacit knowledge that is articulated in chat rooms, discussion forums, comments, or presented in vodcasts and podcasts. Documented knowledge on social media might be regarded as explicit information. However, by adopting a tacit-explicit continuum [51-54], it can be argued that verbalised and externalised knowledge does not necessarily mean that it is completely explicit and that the process of tacit knowledge sharing has been completed.

The tacit dimension of externalised knowledge might sometimes be even stronger than its explicit dimension. Knowledge that is communicated in informal chats or discussions, or demonstrated in practical skills on videos, although recorded, still has more tacit elements. In addition, most of the knowledge shared on social media is not as organised as explicit information in databases or published explicit material. It is mostly unstructured and to some extent resembles the discussions and conversations that occur in a face-to-face interaction.

After externalization, the documentation of tacit knowledge is probably the final phase of tacit knowledge sharing where tacit knowledge becomes relatively explicit and recorded in more standard formats. However, the tacit knowledge may never become completely explicit [61]. There is always a tacit component in knowledge even though it is externalised and converted into an explicit form [55]. Furthermore, the process of knowledge creation as depicted by Nonaka and Takeuchi [7] proceeds in a spiral rather than a linear fashion. Therefore, articulated and documented knowledge can also set off a new spiral of knowledge creation when it is accumulated and then communicated with other people. In summary, the study viewed the documentation of experiences on social media (explicit or tacit) as an effective way to increase information encountering, and hence, tacit knowledge sharing.

While this study opened up a new discussion on how information encountering on social media may occur and how this may help tacit knowledge creation and sharing, there is still a need for further studies to investigate other aspects of this phenomenon. Examples include, how to design social media tools to effectively support information encountering, how to improve the chance of information encountering on social media, and the need for further empirical studies to validate whether information encountering on social media really leads to tacit knowledge creation and sharing. Understating how information encountering on social media might be helpful in tacit knowledge creation and sharing, could enhance the quality of delivering information on social media as well as promoting experts to use such useful tools to keep updated with the latest information.

The study findings may also provide an opportunity for physicians and healthcare organisations to better understand the scope and the impact of employing social media platforms for knowledge sharing. Obtaining insights into how social media contributes to tacit knowledge sharing through information encountering can help healthcare professionals and organisations to discover new opportunities to facilitate knowledge and experience sharing, to adopt and harness social media effectively and to maximise the benefits for the specific needs of the clinical community.

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