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RESEARCH ARTICLE

KNOWLEDGE SHARING PROCESS BETWEEN RADIOLOGIST.

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Abstract

Knowledge sharing is considered a key process for facilitating knowledge management. The objective of this article is to identify the process of knowledge sharing among radiologists during knowledge intensive activities in diagnostic imaging organizations. The empirical research used three phases of data collection: observations, interviews and questionnaire to verify the results. Three radiology and diagnostic imaging organizations from Santa Catarina-Brazil were selected and groups of radiologists belonging to these organizations were analyzed, totaling forty-three participants. For the analysis of the data the thematic analysis technique was used. The shared knowledge in the groups was mainly triggered by specific problems and involved scientific evidence, experience, practice and information on the patient's signs and symptoms to aid in decision making. The success of tacit sharing in the studied groups was mainly a result of interactions and affective ties, shared values, group size and proximity to cognitive units. It is concluded, when individuals perceive the value of their knowledge, to share knowledge becomes a more complex process, knowledge is highly great valued and the individual tends to claim the emotional property of knowledge.

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Introduction:-

This article aims to study the sharing of knowledge. Organizations use their knowledge in the most efficient way because, in essence, it is part of their competitive advantage (Persson; Stirna; Aggestam, 2008). In the case of a health organization, knowledge is at the core of its services and, therefore, efficiency gains can not be achieved without improving the knowledge flows in the organization (Mahgerefteh et al., 2009). In this way, experience management, competence and knowledge about work processes and best practices are important. According to Kharabsheh (2007), Gupta and Govindarajan (2000), knowledge sharing was determined to be the cornerstone of KM processes. In many areas of health, knowledge sharing enhances gains, quality of patient care (Von Krogh; Kim; Erden, 2008), safety, cost, effectiveness, competition and is key to surviving and thriving in a competitive environment. Despite its importance, knowledge sharing is complex and, specifically in radiology, is somewhat critical, since it is very difficult to accurately describe the visual patterns due to its tacit component (Firdaus et al., 2011). Thus, this article aimed to identify the process of sharing knowledge among radiologists during intensive activities in knowledge in diagnostic imaging organizations.

Methods:-

The present study, of a descriptive nature, is part of a wider research on knowledge sharing (Dorow, 2017). The study was multiple cases, since it allows to analyze information from different organizations to obtain more comprehensive results (Yin, 2015). Following the guidance of the authors, more than one source of evidence was used. They were: observations, interviews and verification of results.

Three phases were used to collect data: observations, interviews and questionnaire to verify the results. Three radiology and diagnostic imaging organizations from Santa Catarina-Brazil were selected and groups of radiologists belonging to these organizations were analyzed, totaling forty-three participants. For the analysis of the data the thematic analysis technique was used.

In the first phase of the research, observations were made by radiologists in their natural work environment. The objective of this phase was to understand how environments affect the sharing of knowledge among radiologists. The observations were of the non-participant type and to guide the observations the authors used the field diary tool.

The second phase involved forty-three individual semi-structured interviews with radiologists. The objective of this phase was to complement the understanding obtained by the observations and investigate complementary factors. All interviews were recorded and transcribed in full. From its transcription was performed a thematic analysis that is configured as a form of content analysis used to identify, analyze and expose patterns in the data collected.

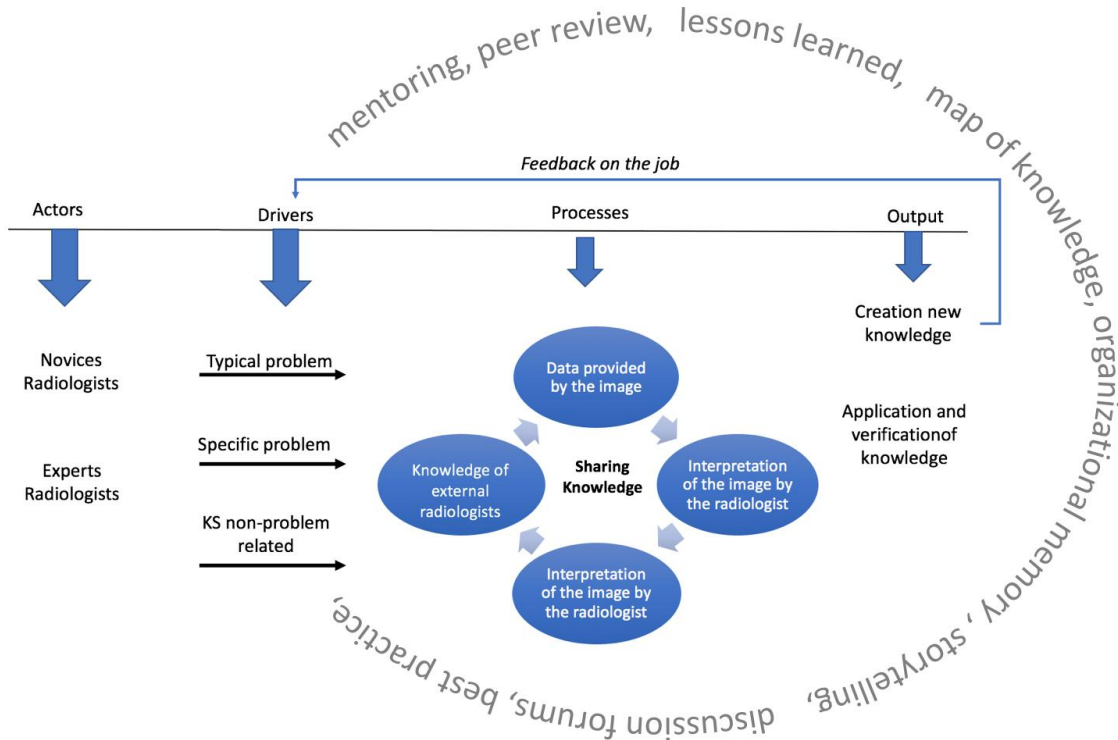
Finally, in the third phase, a verification of the results was performed, aiming to reduce the intersubjectivity subjectivity of the authors' understanding and to verify the results of the research with the participants through a questionnaire that presented the results transforming them into closed affirmations. This allowed corroborating and aligning the results perceived and analyzed by the authors.

The method used was qualitative and a descriptive perspective the process of knowledge sharing among radiologists during intensive activities in knowledge in diagnostic imaging organizations.

Results:-

In general, radiologists have demonstrated a flexible and bureaucratic thinking and believe that sharing is totally intertwined with daily work. This favorable perception facilitates that the knowledge reaches each radiologist who needs it, thus motivating the work practice. Although many authors indicate the relevance of sharing (Patel; Yoskowitz; Arocha, 2009; Firdaus et al., 2011; Al Attar; Shaalan, 2016), they also confirm the difficulty of its effectiveness. It is thought that the respondents perceived a positive effect on sharing - one of the main reasons for the knowledge flow to be effective, both in the organizational and interorganizational environment.

The sharing and internalization of new knowledge creates a generative knowledge process that will be applied to solve new-diagnoses diagnosis, according to Figure 1.

Figure 1:-Process of knowledge sharing by between radiologists

Source: Dorow (2017)

The Figure 1 explains that knowledge shared between novices and experts served as input to CC processes that were triggered by typical problems, specific or non-problem-related. The processes present in the interactions to solve the diagnosis could involve: the data provided by the image, the interpretation of the image by the radiologists, the radiologists' knowledge, internal and external to the organization. During these interactions, the actors demonstrated and applied their knowledge (s) in the construction of the diagnosis, through discussion, experimentation, reflection and feedback.

However, it is important to point out that it is not just a question of repeating what the group already knows. In fact, it is the re-creation mechanism in each organization that allows new knowledge to be shared externally and applied to improve decision making.

As an output of the process, the application and creation of knowledge occurs through interactions and integrations of their interpretations regarding the information provided by the image. When radiologists received feedback on the work performed, the newly created knowledge could serve as a new input to ignite a new cycle of knowledge sharing. The feedback provided could occur both by means of a formal process, as the second signature of the diagnosis, as well as by group meetings (both performed by organizations 1 and 3). The informal feedbacks (most observed in organization 2) occurred in the middle of the work routine. The entire process is supported by different practices and technologies that improve knowledge flow performance.

Some perceived particularities helped to understand the process of knowledge sharing ~~by~~ between radiologists:

1. More frequent interactions among radiologists belonging to the same domain (subspecialty) - although sharing among different subspecialties also occurs; except in the Organization 3 - the fact that the radiologist works between different areas diminishes the creation of specific niches of sharing, making it more homogeneous;
2. Autonomy and independence: each radiologist performs his / her diagnoses independently, only discusses with another professional if he / she deems it necessary; c) Union and cooperation: the feeling of belonging, reciprocity, trust, mutual credibility and group spirit was perceived in all three organizations. However, more pronounced in the groups belonging to organizations 1 and 3. The fact that professionals worked together for

many years facilitated the creation of friendly relationships that were not limited to the work environment (except in organization 2);

3. Efficiency and coordination: mainly due to the physical proximity, due to the side-by-side work of the radiologists in the room of reports. This access to colleagues facilitated the resolution of problems. Other favorable points were: the holding of discussion meetings, in organizations 1 and 3; the image of a leader who provided support, identified in the three organizations; and the constant use of technologies (Mobile Messenger, PACS) by the three organizations;
4. Horizontal hierarchy: in the three organizations, organizational decisions were discussed among the entire group of radiologists (eg, example equipment purchase, software exchange, working hours), although leaders made the final decisions;
5. Feedback: the review of the diagnosis, carried out through the peer review practice, in organizations 1 and 3, further promoted the sharing of knowledge. Organization 2 did not perform it formally, only when the radiologist felt the need to receive feedback.

These particularities are attributed to the environments and practices used. The context of the environment where the sharing was most pronounced (the three witness rooms observed) was relaxed. In addition to sharing specific contents to the diagnosis, the radiologists also talked about personal and family matters, which was important to maintain the relationships of trust and friendships that made spontaneous interactions both common and external radiologists, as the leader's speech indicates:

"Everyone in the group communicates all the time, it's a very common thing, we're always asking ourselves another one there, but when we have a complex case, then people want to get involved around it and start questioning what they really know. You have a strong knowledge base out there and everyone has a different level of knowledge, the challenge is to get that external knowledge and make the group also have that knowledge, because things are changing so quickly, especially in this environment. radiodiagnóstico ". O3E1

The cognitive scheme of the radiologist is socially rooted and advances through these interactions. In all three organizations, interactions facilitated the creation of relationships of trust and helped build an organizational culture conducive to cooperation. The following interviewee presents a good explanation for this cooperation culture to be present in the three groups observed.

"It's normal for doctors to come together, we're together most of the time, we're a group and we need to grow progress together, so we need to help each other. In our case, this is even more pronounced, because we take the name of the place where we work, if the image of the clinic is bad, mine, consequently, will also be affected, if one day. I want to work in another place, the first thing who will ask me is where I have worked in the last few years, so we will do our best to help the clinic be recognized and respected. "O3E8

The climate of collaboration undoubtedly promotes friendly relations between the group. During the daily practice of work occurs the creation of mutual understandings, exchange of opinions, discussions; is where radiologists expose their ways of thinking. It is these discussions, formal or informal, that develop a shared understanding of both what they know and what they need to know. Zigan et al., (2010), Geiger and Schreyögg (2012), and Thomas et al. (2014) emphasized the need for new research on how to achieve the effective acquisition of knowledge and the application of knowledge during the sharing of knowledge to prevent knowledge from being lost during the process. The initiative described in this study provided valuable information on how radiologists ensure the effective translation of knowledge, which directly responded to the need for further research (Geiger and Schreyögg, 2012). Radiologists described several strategic initiatives they took to ensure that knowledge was accurately interpreted and applied when shared with colleagues from different subspecialties. Some examples taken from the speech of radiologists to ensure common understanding:

"Focus on the abnormal and what it may mean, go through the differential with the colleague to establish a common understanding to ensure that we are looking at the abnormal, so we understand the scope of what we are talking about." O2E3

"Look together for the mammogram or MRI and say that's what I think, I want to know your point of view about this injury. If it's not my specialty I can misinterpret. "O3E4

Collaboration was identified as a key to the effective acquisition of knowledge and application, as it allowed radiologists to create a common understanding. Radiologists in this study described various types of initiatives, such as language clarification and repetition to establish mutual understanding when colleagues from other domains were involved. Radiologists have also taken initiatives using virtual environments to achieve understanding. The group belonging to organization 1 argued that the image bank served as a repository that provided a framework for retention of knowledge. This initiative is consistent with Dwivedi et al. (2003), who argued that health centers should have formal knowledge structures to capture critical knowledge and intellectual assets - considered vital for quality improvement - and described several measures - to specify, explain, enlighten, illustrate and follow face-to-face establish a common understanding.

These behaviors indicated that effective sharing of knowledge was of utmost importance to radiologists; efforts were made to ensure that knowledge translation resulted in effective knowledge acquisition and knowledge application to avoid errors. Landman et al. (2013, p.188) emphasized that "high performance hospitals have respect, strong communication, active involvement and close collaboration leading to quality improvement."

Thus, it is through the daily practice of diagnostic resolution (organizational or interorganizational) that radiologists reinterpret their understandings of what is commonly shared among all, and, from this, they begin to construct their personal interpretations, that is, their knowledge personal and collective diagnosis.

Although three main actions have been identified to share knowledge, radiologists prefer to interact face-to-face with other radiologists belonging to the subgroup because they have more common interests. Specifically, in relation to tacit knowledge sharing practices, the relationships of orientation, narration, peer review, and lessons learned have proven to be more suitable for this purpose (Inkinen et al., 2015). Organizations 1 and 3, which promote environments to share knowledge, can facilitate outsourcing and sharing of tacit knowledge.

Conclusion:-

This research highlights the collaborative behavior regarding the sharing of knowledge among radiologists. The studied process, although complex, allows the acquisition, application and creation of new knowledge that makes decision making more secure and assertive. Errors and doubts are not judged, they are seen as opportunities for learning. This is a result of the individuals' engagement to coordinate actions, where objective and subjective understandings are integrated to gain a common sense through shared meanings and interpretations that allow the definition of the context. The performance evidenced by the radiologist during his interactions with the group demonstrates his competence to interpret, produce and discuss diagnoses; a key element in building trusted professional relationships with peers, allowing some radiologists to be recognized as specialists by giving them more authority and power in decision-making situations. The sharing of tacit knowledge occurred during the resolution of the most critical diagnoses, where gaps of knowledge are evidenced stimulating the knowledge holder's explicitness to guide the decision-making of colleagues. This justifies the evidence found regarding the main enabler for sharing that was related to the specific problems, ~~ie,~~ that is knowledge gaps. Knowledge sharing in the three groups of radiologists was effective. This evidence is attributed to aspects related to environments, technology, motivation and leadership. The feedback served not only as a way to confirm the diagnosis, but also as an activator of new interactions, which allowed the application and verification of knowledge, or the creation of knowledge, improving the individual and collective competence of radiologists.

It is concluded that when individuals perceive the value of their knowledge, sharing knowledge becomes a more complex process - knowledge is highly valued and the individual tends to claim the emotional ownership of knowledge.

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