Original research article

The current state of knowledge management activities in health facilities in Slovakia

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ABSTRACT

The research article compares opinions of domestic and foreign authors concerning the most important knowledge management aspects through the application of which a certain model of KM implementation in a health facility is affected. Knowledge management is a discipline with a high potential for development because of highly qualified work in the health care sector, and because of changes that occur in the science itself, as well as in the surrounding social environment, requiring creation and constant sharing of knowledge. The main goal of the article is to evaluate the current state of knowledge management activities in the health facilities in Slovakia. The attention is focused on knowledge management process and its dynamics. A questionnaire distributed to the management representatives of 89 health facilities in Slovakia was used for data collection. To evaluate the questionnaire, descriptive statistics and correlation analysis were applied, and statistical significance was examined at the significance level of \( \alpha = 0.05 \) using \( t \)-test. The health facilities in Slovakia that were surveyed use codification strategy, which assumes the utilization of database information. Explicit knowledge is utilized, and knowledge workers’ priorities are not given emphasis in this strategy. Personalization strategy where knowledge is very closely linked to an individual and can only be disseminated by means of personal contact and the creation of a favorable culture is used very little and mostly in small-sized organizations. In the current health facility environment, the static model of knowledge management prevails, where the focus is primarily on existing knowledge, and on its ongoing use and replenishment using classic methods of acquisition and storage.

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Introduction

In the health care sector the importance of knowledge is obvious at first sight. It is highly qualified work where the pace of changes occurring in the science itself, as well as in the social environment, necessitates the creation and constant sharing of knowledge. One of the main principles of raising health care quality is knowledge-based care [1]. Knowledge is becoming one of the strategic resources in 21st century organizations that should provide for a stable pace of performance growth and global competitive advantage [2]. Knowledge management, however, does not involve only information technology and its implementation in an organization. KM is not only about health care sector electronization through the introduction of e-health (that is currently under so much discussion). It is more than that – it is something that gives information added value, transforming it into knowledge through mutual sharing, through the way individuals work, how they behave towards one another and how they enable and provide to each other access to relevant information sources.

Implementation of knowledge management leads to knowledge transfer into innovation activities, which, in turn, are the source of efficient performance of health facilities’ pre-set objectives. The transfer of new knowledge into a successful innovation is accompanied by various problems that can be avoided by organizations if they can create in their inner environments conditions for an effective identification of knowledge, conditions for the application of effective procedures to overcome knowledge scarcity, as well as conditions for optimal exploitation of the carriers of necessary knowledge in creative teams. In the process of choosing an optimal knowledge management model in the context of innovative solutions that make organizations constantly move forward, it is necessary to search for what knowledge to use and how to obtain, store and transform such knowledge into an organization’s know-how.

Knowledge occurs in organizations in various forms – as documents, procedures, standards, as well as employees’ habits and practice. An important factor of an organization’s sustainable development is on the one hand ensuring a balance between the existing knowledge and its use and on the other hand the effective creation of new knowledge. The above-mentioned characteristics are also related to the creation of knowledge management models in an organization that are based on an emphasis on either the existing knowledge or on the effective utilization of intellectual capital linked to implementation of changes in the organization.

The sector of large health facilities, like that of the public administration at large, has been traditionally associated with characteristics such as inflexibility, inefficiency, rigidity, bureaucratization and conservatism, which gives an impression that such organizations lag behind the business sector even in regards to knowledge management. The dynamics of the development of an organization’s environment should be in keeping with the dynamics of the knowledge management process.

A number of research projects in knowledge management are being conducted that focus on diverse areas, such as suitability of knowledge management support tools, knowledge management application in a business environment, knowledge management development in various organizations, development of knowledge in society, etc. [3, 4, 5].

The basis for knowledge management analysis is the very definition of the examined concept in terms of purposeful management in the creation, acquisition, sharing and use of knowledge [6, 7, 8, 9]. The analysis also involves explicit knowledge, which is apparent in most organizations, but the emphasis in knowledge management is placed on tacit knowledge, which is the means for an organization to obtain a competitive advantage. Thus tacit knowledge is what creates values and determines an organization’s performance [10, 11, 12]. Edvardsson and Gurst [13] claim, that the tacit knowledge management process includes fewer elements than the explicit process. The prevailing form of knowledge determines the categorization of knowledge management strategy into codification or personalization strategy, which focus either on hard factor or soft factor-oriented approaches [14].

In addition to the afore-mentioned knowledge management strategies, Maybury and Thuraiasingham [15] present two types of strategies, of which the first focuses on the existing and available knowledge using the best practice approach, and the second on creating new knowledge. According to Liao et al. [16] organizations should be proactive in combining existing and new knowledge.

Knowledge management is inseparably linked with intellectual capital [17, 18, 19]. Grublová and Franek [20] delineate various views of intellectual capital: innovation, customer and process views. An inevitable factor for knowledge management implementation is a synergic interconnection of intellectual capital and the social climate of an organization’s internal environment.

The basis for an effective implementation of knowledge management is formed by critical factors of KM success in the organization. The definition of such factors has been explored by a number of authors. Skyrme and Amidon [21] identified 7 key factors involved in implementing knowledge management; Holsapple and Joshi [22] presented 3 main factor classes: managerial, resource and environmental, specifying key factors within each class. Chourides et al. [23] determined 5 factors that are crucial for a successful implementation of knowledge management. Wong [24], Chong and Choi [25], Wong and Aspinwall [26] identified as many as 11 key factors for a successful implementation of knowledge management and a great many other researchers provided their specifications of key factors as well [27, 28]. Among the factors emerging in all of the above-mentioned studies were organizational culture and strategy, and the ability to lead people, which occurred most frequently, followed by organizational structure, human resources and information technologies. Truneček [29] recommends that an appropriate organizational structure that supports knowledge management, an appropriate type of organizational (knowledge) culture, and a specific method of working with knowledge be implemented in an organization.
In addition to the critical success factors of knowledge management, obstacles to its implementation are also defined. The most frequently stated obstacle is determination of the effectiveness of knowledge management implementation, and its measurement [30]. Serenko et al. [31] claim that the three main obstacles to knowledge sharing include individual, organizational and technological obstacles.

There are two basic knowledge management models present in organizations [32]. The first model is focused on achieving conformity of the status of intellectual capital with requirements for the functioning of the organization's internal processes in responding to the organization's current developments in its environment. The second model is aimed at increasing the preparedness of the organization's intellectual capital for the implementation of changes in the organization's behavior that result from changes in the organization's environment.

In their perception of knowledge management, Bali and Dwivedi [33] bear in mind specific aspects of health care and the provision of medical services, and point out that it is the complexity of the health care sector that poses a special challenge for the adoption of knowledge management systems in health care. Moreover, the effects of such adoption are expected to be significant. Abidi [34], who deals with knowledge management-based decision-making support, involved mainly with decision making associated with prescribing medicines, health protection, epidemiology etc., points out the importance of knowledge management in the health care sector, while other authors see a reflection in the reduction of errors and mistakes in medical treatment and also in the financial management of resources. Knowledge management constitutes the basis for evidence-based medicine, which is the key aspect of present-day medical practice, playing an important role by organizing knowledge and making it available [35, 36].

In addition to public health, health care sector financing and evidence-based medicine, many authors deal with enhancing the quality of medical services provided, within the context of knowledge management [37].

In specialized literature it is also possible to find challenges related to the implementation of knowledge management in health care. The fundamental challenge is still the awareness of the importance of this tool that must be inevitably linked with the change management strategy [38]. It is necessary to focus attention on both knowledge management factors – people and technologies, and not to perceive knowledge management as a craze or panacea, but to gradually implement it into organizational culture [39]. Problems are seen in the time pressure on healthcare professionals, gaps in electronization, or in models or indicators.

The main goal of the present article is to evaluate the current state of knowledge management activities in health facilities in Slovakia. The attention is focused on knowledge management process and its dynamics.

Materials and methods

Health facilities provide health care by means of either outpatient or inpatient treatment, via primary, secondary and follow-up health care, in state-funded and non-state health facilities. The objective of all facilities is to assure the quality of services provided by them, focusing on the quality of life of each patient.

Such goals may only be attained by those organizations that possess adequate knowledge and knowledge creation, sharing, dissemination and use as well as high-quality employees that are carriers of such knowledge. Thus, the implementation of knowledge management, and the management and leadership of so-called knowledge workers, whose share among health facility workers should increase poses a great challenge for health facilities.

The fundamental factor for the attainment of the main goal is the retrieval of information from specialized literature authored by Slovak and foreign researchers. Obviously, various surveys in knowledge management implementation that have already been conducted and that can be found, in the environment of health facilities [40], but which also occur in analyses performed within the framework of public administration presented as miscellaneous research studies, particularly abroad [41, 42], are helpful to provide for a better orientation in the given area as well.

The knowledge base for our next research steps was obtained by the analysis, comparison and subsequent synthesis of the above-mentioned resources. The next steps undertaken in our research were application in practice and verification of the acquired knowledge on a sample of selected health facilities in Slovakia. The survey was conducted as a questionnaire survey in the period from January 2015 to March 2016 in two stages. Much attention was paid to the preparation of the questionnaires, which had been preceded by a discussion with the representatives of the selected facilities and experts from the Department of Management, who provided valuable insights into the technical aspects of the survey. The questionnaires were also prepared using theoretical knowledge, research studies carried out in the area of knowledge management (as applied in practice by enterprises, mainly in the sphere of health care and public administration), which possess some specific features even in regard to knowledge management.

In the first stage, we drew up a request for cooperation in conducting a survey, which included an explanation of the whole procedure, and submitted it by e-mail to representatives of 130 health facilities in Slovakia. We received replies from 105 representatives, of which 89 stated their willingness to participate in the survey (68.5% return rate). The rest replied that they were not interested in the given issue, stating various reasons. The most frequent reason stated was lack of interest in the survey because their organizations do not apply knowledge management as such. Our survey sample constituted of a set of 89
As part of the practical verification and summarization of the acquired data, we also used other methods in addition to the questionnaire method, namely comparison, statistical data processing and data presentation in the form of graphs and tables, which is a suitable way of providing readers with a quick preview of the problem in question. Descriptive statistics and correlation analysis were applied. In the first step we delineated the respondent sample surveyed using descriptive statistics, and simultaneously, we used selected descriptive characteristics to analyze individual variables obtained in the 2nd stage of the survey. Subsequently, correlations between selected factors were calculated. Statistical significance was examined by means of Pearson correlation coefficients and the coefficient of significance, with only such correlations taken into account where the Pearson correlation coefficient was at least 0.3 and the coefficient of significance was less than 0.05. Calculations were made in the STATISTICA software; the significance of the difference was determined using the \( p \) value corresponding to the calculated t-criterion at the significance level of \( p = 0.05 \).

**Results**

**Selected characteristics of health facilities surveyed**

The characteristics examined by descriptive statistics are displayed in Table 2. The sample surveyed constitutes 89 health facilities of various sizes measured by the number of employees, and of various structures. In regards to structure, the sample surveyed was formed mostly by hospitals with polyclinics (65.2%) as opposed to the pure hospitals (13.5%) and policlinics (12.3%). Health facilities were of various sizes based on the number of employees. Facilities with more than 1000 employees were the most heavily represented ones (34.8%), followed by facilities with 500–999 employees (32.6%). The number of employees in the range of 250–499 was stated by 20.3% facilities. This means that large organizations were represented in the sample at 87.7%. Medium-sized organizations accounted for 11.2% and small-sized organizations formed only 1%.

**Process of effective application of knowledge management**

The area surveyed is oriented on the knowledge management process itself. In its context, it is important to find out what phase of knowledge use the respective organization is in. Thus the following options were offered to the respondents:

- knowledge acquisition is mostly the task of (and in the interest of) the employee as an individual;
- knowledge management is not implemented in organizations as a whole, the representatives leave this area in the competence of individual organizational units;
- most of the necessary information exists but is available only to a certain limited circle of employees or managers;
- emphasis is placed on explicit knowledge; quality of information, sources and mechanisms for their use is evaluated;

<table>
<thead>
<tr>
<th>Number</th>
<th>Share in the overall sample in %</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Self-administration</strong></td>
<td></td>
</tr>
<tr>
<td>Hospital</td>
<td>12</td>
</tr>
<tr>
<td>Hospital with polyclinic</td>
<td>66</td>
</tr>
<tr>
<td>Policlinic</td>
<td>11</td>
</tr>
<tr>
<td>Total</td>
<td>89</td>
</tr>
<tr>
<td><strong>Number of employees</strong></td>
<td></td>
</tr>
<tr>
<td>Up to 49</td>
<td>1</td>
</tr>
<tr>
<td>From 50 to 249</td>
<td>10</td>
</tr>
<tr>
<td>From 250 to 499</td>
<td>18</td>
</tr>
<tr>
<td>From 500 to 999</td>
<td>29</td>
</tr>
<tr>
<td>Over 1,000</td>
<td>31</td>
</tr>
<tr>
<td>Total</td>
<td>89</td>
</tr>
</tbody>
</table>

As part of the practical verification and summarization of the acquired data, we sent an open-question questionnaire to the respondents since we wished to obtain from the facilities surveyed primary information concerning the area of knowledge management, and to submit to them this information after processing for a more detailed evaluation in the second stage. For the second stage, we prepared a closed-question questionnaire in which the respondents were to indicate their position on each question, either by selecting one of the several options or by using a 1–5 Likert scale (where 1 means a factor of little importance and 5 a very important factor).

The structure of both stages is displayed in Table 1.

<table>
<thead>
<tr>
<th>Table 1 – Main research variables</th>
</tr>
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<tbody>
<tr>
<td><strong>1st stage</strong></td>
</tr>
<tr>
<td>1.</td>
</tr>
<tr>
<td>2.</td>
</tr>
<tr>
<td>3.</td>
</tr>
<tr>
<td>4.</td>
</tr>
<tr>
<td><strong>2nd stage</strong></td>
</tr>
<tr>
<td>4.</td>
</tr>
<tr>
<td>5.</td>
</tr>
<tr>
<td>6.</td>
</tr>
<tr>
<td>7.</td>
</tr>
<tr>
<td>8.</td>
</tr>
</tbody>
</table>
• passive utilization of existing intangible assets;
• workers with the greatest knowledge potential and knowledge contribution are appreciated;
• knowledge is reflected in the value and quality of services rendered, and is used to create new knowledge;
• the organization’s activities are based on organization-wide knowledge management; active creation of knowledge prevails.

Respondents were allowed to mark more than one option. Therefore, the sum of all percentages specified next to the individual answers in Chart 1 exceeds the 100% mark.

The respondents’ answers imply that most organizations do not have the knowledge management in place as a whole, the representatives leave this area in the competence of individual organizational units (46.07%), and knowledge acquisition is mostly the task of the employee as an individual (67.42%). In one third of the organizations, emphasis is placed on explicit knowledge; the quality of information sources and mechanisms for their use is evaluated and an equal number of respondents state passive utilization of existing intangible assets. 16.85% of respondents replied that most of the necessary information exists but is available only to a certain limited circle of employees or managers. In regards to tacit knowledge, in most cases a mechanism for their dissemination is missing.

It is our opinion that the area of knowledge management is sidetracked under conditions of Slovak health facilities, as only 3.37% of respondents answered that workers with the greatest knowledge potential and knowledge contribution are appreciated; 2.25% specified that knowledge is incorporated into the provision of services, and the same percentage share of respondents stated the fact that the facility’s activities are based on organization-wide knowledge management accompanied by active knowledge creation. Similar findings were obtained in foreign studies accentuating the acquisition of tacit knowledge [34].

The knowledge management process in any of the above-mentioned phases starts with knowledge acquisition. Therefore, we focused our attention on questions related to knowledge acquisition, methods of knowledge acquisition and development, storage of acquired and processed knowledge as the organization’s know-how, which then becomes an important source of the organization’s competitive advantage.

The importance of individual factors surveyed, as seen by the respondents in relation to their organization and to a successful achievement of results, is displayed in Table 3. A 1–5 scale was used (1 – completely unimportant factor, 5 – highly important factor). Factors are specified based on the main factor groups, obtained by summarizing the respondents’ opinions in the 1st stage of the survey.

<table>
<thead>
<tr>
<th>Methods of knowledge acquisition</th>
<th>Mean</th>
<th>Std. dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regular classic meetings</td>
<td>4.93</td>
<td>0.25</td>
</tr>
<tr>
<td>Employee training</td>
<td>4.37</td>
<td>0.59</td>
</tr>
<tr>
<td>Informing via intranet</td>
<td>4.27</td>
<td>0.75</td>
</tr>
<tr>
<td>Physical communication</td>
<td>2.85</td>
<td>1.20</td>
</tr>
<tr>
<td>Teamwork</td>
<td>2.36</td>
<td>0.55</td>
</tr>
<tr>
<td>Informal communication</td>
<td>2.76</td>
<td>1.22</td>
</tr>
<tr>
<td>Creative discussions</td>
<td>2.63</td>
<td>0.65</td>
</tr>
<tr>
<td>Effective feedback</td>
<td>1.80</td>
<td>0.84</td>
</tr>
</tbody>
</table>

In regards to knowledge acquisition and sharing, regular classic meetings were stated as the main method of knowledge acquisition; this method received a high average importance value of 4.93 and a low standard deviation, which points out a low variability of values in the sample. A relatively high average importance was assigned to two other methods – employee trainings (4.37) and informing via Intranet (4.27). The remaining methods considerably lag behind: physical communication (2.85), teamwork (2.36), informal communication (2.76), creative discussions such as brainstorming (2.63), and effective feedback (1.80).
Considering that higher standard deviations were found for some indicators, a fact attesting to differences in the respondents’ answers, we examined more closely the following correlation facts. Statistical significance was discovered in respect of the size of the organization and feedback ($p = 0.024$ at $\alpha = 0.05$), in respect of the size of the organization and informal communication ($p = 0.031$ at $\alpha = 0.05$) and in respect of the size of the organization and use of creative discussions ($p = 0.027$ at $\alpha = 0.05$).

The above-mentioned results concerning knowledge acquisition and sharing are also related to the method of knowledge storage that is based chiefly on using MS Office or other software (100%), or on creating various types of databases (64.0%). Classic archives are also used (32.6%).

Dynamics of knowledge management processes constitutes another analytical tool for diagnosing current coverage of knowledge management activities in individual areas as selected. The evaluation was performed by means of questions divided into 10 groups, where respondents were asked to assign each group points on the 1–5 scale (1 – completely unimportant factor, 5 – very important factor). Subsequently, the average for each group was calculated; the average values obtained for the individual groups evaluated are presented in Table 4. The explanation regarding the contents of individual factors is as follows:

- leadership – is a clearly defined role of knowledge within the organization’s vision and to what extent responsibility for knowledge strategies is defined;
- measurement – what is identified here is to what extent intellectual capital is systematically measured and managed in the organization;
- processes – systematic nature of directing knowledge management activities towards the organization’s results is evaluated;
- explicit knowledge – quality of information sources and mechanisms for their use is evaluated;
- tacit knowledge – measure of providing for tacit knowledge sharing in the organization is identified;
- culture – degree of implementing culture in the organization to support acquisition, creation, sharing, use and re-use of individual and organizational knowledge;
- knowledge centers – places where knowledge is concentrated;
- use – identification of the extent to which knowledge is reflected in the value of products and the extent to which knowledge is used to create new knowledge;
- people and their skills – identification of the extent to which knowledge management as a key management skill has been adopted by the managers;
- technological infrastructure – use of technological systems for the improvement of knowledge flow and for the creation of the organizational memory is monitored.

For the sake of greater clarity, the analysis results are visualized in a position map, which clearly indicates the current coverage of knowledge management activities in the individual areas selected – Chart 2.

The $x$-axis represents the average, the $y$-axis standard deviation. Organizations in their initial phases of knowledge management implementation usually have a well-developed technological infrastructure, explicit knowledge and to some degree, also processes. On the other hand, such organizations lack measurement, tacit knowledge management, a culture supporting the natural sharing of knowledge and interconnection of people and knowledge. The optimal model representing a desired future state is displayed on a fictional position map – Chart 3.

The differences between the actual and the desired state of knowledge management activities coverage in the individual areas selected reveal aspects on which focus must be given when projects in the given areas are to be implemented.
Knowledge worker management

Knowledge worker management requires changes in a number of traditional approaches to human resources management. We wanted to know whether the organizations’ representatives could identify priorities in managing such workers. The respondents were asked to assign importance to individual tools and methods of knowledge worker management in organizations managed by them, using a 1–5 scale (1 – unimportant, 5 – highly important). The results obtained are presented in Table 5.

Table 5 – Priorities in knowledge worker management

<table>
<thead>
<tr>
<th>Priorities in knowledge worker management</th>
<th>Mean</th>
<th>Std. dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adjustment of criteria used for personnel selection</td>
<td>1.36</td>
<td>0.53</td>
</tr>
<tr>
<td>Strengthening of work autonomy</td>
<td>1.73</td>
<td>0.62</td>
</tr>
<tr>
<td>Career planning</td>
<td>1.60</td>
<td>0.56</td>
</tr>
<tr>
<td>Room for higher work flexibility and balance between professional and personal life</td>
<td>1.79</td>
<td>0.59</td>
</tr>
<tr>
<td>Support of creativity</td>
<td>2.01</td>
<td>0.67</td>
</tr>
<tr>
<td>Communication support</td>
<td>3.02</td>
<td>0.60</td>
</tr>
<tr>
<td>Interactive management style</td>
<td>3.06</td>
<td>0.57</td>
</tr>
<tr>
<td>Informedness</td>
<td>3.38</td>
<td>0.61</td>
</tr>
<tr>
<td>Performance-based evaluation</td>
<td>3.74</td>
<td>0.87</td>
</tr>
</tbody>
</table>

Generally, procedures necessary for knowledge worker management are used very little. The above-mentioned factors are not perceived by the respondents as important in the context of knowledge management application. In regards to the adjustment of criteria used for personnel selection within the context of knowledge management application and knowledge worker management, this factor is perceived as a little important (1.36) and is not respected in the knowledge worker acquisition process.

Another priority – strengthening of work autonomy and work concentration had a similar value (1.73). The creation of room for higher work flexibility and a balance between professional and personal life to be provided to knowledge workers is perceived as a priority of little importance (1.79). Career planning is underestimated (1.60). There may be fears for the position and job as such; and career advancement plans need not always include only advancement within the organization’s hierarchy. Challenges associated with knowledge worker management also involve the full utilization of their creative potential, which is performed and perceived as important only by a small fraction of the respondents since the average value obtained only amounts to 2.01. Communication support received a higher average evaluation within knowledge worker management priorities (3.02). A similar average value (3.06) was obtained by interactive management style, i.e. a style based on openness, willingness to listen to others, to respect their views and to seek consensus. Informedness was presented as an important knowledge worker management priority at 3.38, and performance-based evaluation received the value of 3.74.

We also examined dependencies using the correlation coefficients between individual factors (above) in order to find potentially interesting dependencies (correlation coefficient in excess of 0.8 was considered as the indicator of a strong correlational relationship). It was found that organizations which perceive organizational culture as an important knowledge management implementation factor also stated informedness and interactive management style as priorities in worker management. In such cases, the correlation coefficient was higher than 0.8. Informedness is an important tool that causes workers enjoying confidence to become more loyal. Knowledge workers should be regularly informed on the organization’s development and strategy, and should have the opportunity to ask corresponding questions in regular meetings with the management. An interactive management style is crucial for this because it is based on openness, willingness to listen to others, to respect their views and to seek consensus,
and to consult one’s decisions prior to their adoption with a wider circle of colleagues. Other correlations are either mild or small.

It is interesting that creative discussions as a knowledge acquisition method were assigned a less-than-average importance. Respondents who in spite of this perceive creative discussions as important do not associate them with the option of managing and applying this tool within the framework of knowledge worker management. Such an approach would bring them much greater results in achieving benefits from knowledge management application.

**Discussion**

The basis for the vision for health care quality is care that is based on knowledge, where knowledge management is oriented on the method of how to acquire, share, disseminate, create and use knowledge, and how to increase the productivity of it. The pre-requisite for knowledge management functioning in an organization is that the organization has a culture which is open to knowledge acquisition and use, and which supports continuous employee training. Views of knowledge management may be diverse and may be examined from various perspectives representing specific points of views concerning this area. We have focused on process perspective and found in the survey that health facilities are in the initial stage of knowledge management. Organizations in their initial phases of knowledge management usually have a well developed technological infrastructure followed by processes and knowledge centers supporting active knowledge management. Almost all organizations lack measurement, active management of tacit knowledge, culture that supports natural sharing of knowledge and interconnection of people and knowledge (Chart 1 and Table 2). Knowledge, unlike information, resides in people, not in computer files. Similar findings were obtained by many foreign studies, which point out the initial stage of knowledge management in health facilities, in spite of advanced technologies prevailing in this sector [34, 43], low level of tacit knowledge [34], poor organizational culture in the sense of supporting knowledge sharing in these facilities [35] and mainly, deficiencies in tacit knowledge measurement [35].

Moreover, the knowledge acquisition phase aids in indicating the stage which knowledge management in the respective organization is at. It is related to the organization’s culture, which creates environment for efficient knowledge acquisition and subsequent knowledge sharing. The organization’s culture is one of the critical success factors of knowledge management implementation. This was confirmed by a great number of researches that placed emphasis on the influence of organizational culture in implementing knowledge management [23, 42, 44, 45, 46].

In this context it is necessary to focus attention on how to obtain knowledge, which means using a considerable amount of data accumulated in the information systems built. The problem nowadays is not the amount of information. Workers are overloaded by it. What is important is to be able to analyze information, make correlations, choose relevant information and transform them into knowledge. Therefore, organizations must focus on how to create corporate culture so as to make workers effectively share information. Subsequently, it is important to explore within the organization’s environment how to profile the right information and knowledge for workers, how to prevent information overload and how to protect the organization’s knowledge from the competition. All the above-mentioned areas are related to the organization’s environment, which should create suitable conditions for an effective application of knowledge management.

To make employees share their knowledge voluntarily, it is necessary to create a culture of constant physical communication, teamwork support [47], open communication, improvement of organizational and interpersonal relations, effective feedback or other tools enabling workers to keep knowledge in their heads. The classic concept of organizational units and working positions must be abandoned and open, changing teams and communities in the context of less formal organizations must be created. Preferring knowledge flow to a classic hierarchical model by the organization leads not only to greater innovation and flexibility of the organization but also to changes in the workers’ thinking. It is obvious that the above-mentioned aspects have so far been neglected in health facilities, and their representatives do not consider such factors important in connection with knowledge management.

Taking into account the dynamics of knowledge management processes within the framework of diagnostics of the current coverage of knowledge management activities in individual areas as selected, we delineated those that require the most significant shift in organizations. We ascertained the current status as being highly underestimated in many areas, which is clearly shown in the position map (Chart 2). The most important, fourth quadrant holds explicit knowledge and technological infrastructure attesting to a low level of knowing the knowledge management substance. The target state is indicated in the next figure, Chart 3, making visible significant differences and thus the necessary direction of knowledge management activities in health facilities. The most complicated areas include measurement of intellectual capital and determination of how it is reflected in the product value. Furthermore, we can see a problematic area in leadership and style aimed at creating a knowledge environment, where, however, there are best opportunities for improvement, if the representatives seek to work on themselves in this area. An important contribution in this respect may be the model designed to assess organizational readiness for adopting knowledge management, applicable to various organizations [44].

In the area of determining knowledge workers’ priorities, the greatest shortcomings are seen in the underestimation of activities such as knowledge worker selection and adjustment of criteria used for selecting such persons (Table 5). These involve increased respect for independence and inner motivation of workers, but also
willingness to accept responsibility and ability to work in a team, communication skills, etc. Also underestimated is the activity of strengthening work autonomy and work concentration where knowledge workers demand that the organization does not impede their work through futile and bureaucratic obstacles and be helpful to them in various forms. Career planning is also among the challenges connected with knowledge worker management. Career advancement plans need not always include only advancement within the organization’s hierarchy. The same role may be played by career advancement programs that focus on the development of workers’ knowledge and experience. In most cases, the knowledge workers’ work is not restricted only to their office. Flexible working time arrangements corresponding to their lifecycle phase not only pose no obstacle to their performance but also remove its barriers, and thus low perception of this priority in the context of creating room for higher work flexibility and balance between professional and personal life is evaluated as negative.

Our findings coincide with other researches that in health facilities no attention is paid to knowledge worker management or to orientation to different approaches to their leadership [43, 48]. An American study conducted in the environment of health facilities pointed out a striking influence of the style of management and approach to employees when using their knowledge in satisfying the patient’s needs [38]. Just as many other foreign surveys [40] do, our survey also indicated the fact that codification strategy is used, which assumes the utilization of database information. Explicit knowledge is shared, and knowledge workers’ priorities are not given emphasis in this strategy. A personalization strategy where knowledge is very closely linked with the individual and can only be disseminated by personal contact and creation of favourable culture is not used and hence personnel management does not reflect any other approaches to knowledge worker management indicated by this knowledge strategy. The size of the organization does not play an important role in knowledge management implementation. Certain tendencies towards personalization strategy were discovered in smaller organizations. We can point out the fact that large state-funded hospitals and smaller regional ones are involved in long-time arguments over which one of them is in a more difficult situation and why it is that mainly state-funded hospitals are the less effective ones. One of the reasons may be their attitude towards knowledge management that was more positive in the case of smaller organizations.

Conclusion

The main goal of the article is to evaluate the current state of knowledge management activities in health facilities, focusing on the knowledge management process and its dynamics. In the current health facility environment, the static model of knowledge management prevails, where focus is primarily given to existing knowledge, and to its ongoing use and replenishment using classic methods of acquisition and storage. The basis is adaptation to new conditions. No interest in proactivity was shown in knowledge creation, which is based not only on mere adaptation but also on more effective flexibility. The more turbulent the development of the surrounding environment, the greater the share of the dynamic component. Providing for flexibility and constant innovation must be in the knowledge management model. These elements affect further management tools based on an autonomous component within all internal processes.

The perception of knowledge management in the facilities surveyed in the sense of systematic knowledge management is currently still in its embryonic stage, with mostly technological infrastructure being the developed element. Missing factors are measurement, active management of tacit knowledge, orientation to culture supporting natural knowledge sharing and interconnection of people and knowledge. The main methods of knowledge acquisition and sharing are: classic formal meetings, employee training, and informing via Intranet. Diagnosing the current knowledge management activities coverage in individual selected areas revealed aspects, on which focus must be given when projects in the given areas are to be implemented. In this context it is possible to stipulate some recommendations that could move the current state of knowledge management in the health facility environment a few steps forward. The management of such facilities should especially focus on:

• improvement of organizational processes by enhancing them with knowledge;
• position and competence adaptation of knowledge management within the organizational structure, including acceptance of flexibility and teamwork;
• knowledge management integration into organizational culture with a focus on constant physical communication, teamwork support, open communication, improvement of organizational and interpersonal relations, effective feedback and other tools designated for storing mainly tacit knowledge;
• interlinking with other management functions, principally with human resource management;
• knowledge worker management and orientation to different approaches to their leadership;
• knowledge sharing by creating knowledge communities or networks, and support of such activities by the management;
• area of measuring and assessing knowledge; currently specialized literature offers a great number of procedures to implement these activities;
• use of new tools and methodologies for knowledge management.

Generally, certain procedures necessary for knowledge worker management are used very little. The above-mentioned factors are not perceived by the respondents as important in the context of knowledge management application.

Knowledge management is a discipline that at present has a high potential for development when changes are constantly occurring. This is also how knowledge management should be seen in regard to the provision of health care services where it is now perceived only as
a response to certain new needs and not as a meaningful, systematic, purposeful and proactive activity.

**Conflict of interest**

The authors declare that they are not aware of any conflict of interest related to this article.

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