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Introduction

Leaders in organizations face the multifaceted challenges of understanding the market, meeting customer needs, and anticipating and adjusting to changes in the market to secure a competitive advantage (Bäckström, Ingelsson and Wiklund, 2012). These challenges increase the demand to develop greater efficiency to improve operational performance (ibid) and to develop healthy work environments. A healthy work environment has a high value for organizations and their co-workers, and the quality and style of leadership are factors that influence the level of health (Jiménez, Winkler and Dunkle 2017). Ingelsson (2013) maintained that leadership is of great importance and that managers are vital actors when a culture is created. This finding is in line with Snyder et al. (2016), who stated that if leaders want to transform the culture within an organization, they have to act and conduct new practices that focus on building an open work culture. Ingelsson et al. (2018) found that working with the leadership group affected the culture of the whole organization. They also used a measurement approach that reflected both the soft and hard aspects of the culture and thereby corresponded to a balanced performance measurement system (ibid). This approach helped focus the measurement approach on the culture and values of the organization (ibid). Quantitative data from the measurement need to be analysed qualitatively and quantitatively if a management tool to monitor and build organizational culture is wanted (Ingelsson et al., 2016).

According to Zelnik, Maletič, Maletič, and Gomišček (2012), an organization can only be successful with successful co-workers, and this success depends on their qualifications and their motivations. This finding is confirmed by Arnetz, Lucas and Arnetz (2011), who found consistent connections between the organizational environment, organizational efficiency, work-related stress and co-worker mental health. Involvements aiming at both the traditional psychosocial environment and organizational efficiency can contribute to decreased co-worker stress, as well as improved mental health and thereby improve organizational performance (ibid). Practising Quality Management (QM) can benefit operational performance (De Cerio, 2003) and is central in stimulating quality and efficiency within organizations, as well as for improving co-worker well-being (Liu and Liu, 2014). This result is in line with earlier research, which found that the QM values 'Leadership Commitment' and 'Participation of Everybody' are beneficial for the co-workers' perception of the health of the organization (Lagrosen, Bäckström and Lagrosen 2010; Bäckström, 2009). Regrettably, research shows that many organizations still lack healthy working environments (ibid). One cause for the unsuccessful management of QM practices seems to be a focus on tools and processes and an absence of understanding of the influence of organizational culture (Ingelsson, Bäckström and Wiklund, 2010). This result is in line with Turesky and Conell (2010), who commented that several studies show that QM initiatives often fail due to managers not taking the time to build a culture of engagement and innovation. Other scholars have asserted that leaders fail to realize the importance of co-worker involvement, and instead, the leaders see themselves as the sole problem solvers (Spear, 2004). Leadership communication is also important to ensure low levels of employee absences due to sickness (Stoetzer et al., 2014). According to Zelnik *et al.* (2012), measuring co-worker satisfaction can serve as an important communication tool to help link top management and co-workers and enable them to share their different perspectives. Both co-worker and manager perceptions are important to facilitate the development of and communication within an organization (ibid).

Bitici et al. (2006) proposed that there is a solid connection between performance measurement and organizational culture, which managers need to understand to be able to

impact quality development. However, Kollberg et al. (2007) and Snyder et al. (2016) recommend that for this connection to occur, a performance measurement system needs to be developed that combines hard data outcomes with the soft measures found in organizational cultures, including values, norms and behaviours. One way to help leaders understand the existing culture and the co-workers' perception of the managers' behaviours is to measure both the co-workers and managers' perceptions, compare the results and analyse the results quantitatively. Thus, the purpose of this paper is to modify an existing survey that measures co-worker perceptions of health-related QM values and the perceived health of the organization and to measure both the co-worker and manager perceptions of those values. The purpose is also to test the modified survey and then compare the results from managers and co-workers from two organizations where the survey has been used to measure baseline data in a Lean research project and to help managers understand the areas where improvement is needed.

Leadership for quality management culture

Culture creation and management are the very nature of leadership (Schein, 2004). How the manager behaves affects the attitudes and behaviours of the co-workers, as managers have great influence on which culture will be predominant in an organization (ibid). According to Ingelsson (2013, p 69), 'managers are expected to act as role models to enhance the culture by displaying the behaviours they themselves demand from their co-workers'. Leadership behaviours that are vital in a quality context have been revealed as an important supplement to other leadership methods (Lakshman, 2006).

Leadership in the form of 'Management Commitment', including co-worker involvement, delegation and coaching, is a supporting value and is required when QM is practised in successful organizations that have attained good co-worker health (Wreder 2008). One important quality necessary for organizational success, which is listed by CEOs and other senior executives in many industries and several different countries, is good communication skills (Barret, 2006). The leadership behaviours related to QM in organizations are as follows: 'communication with both internal and external customers; communicating the importance of continuous improvement of processes and outcomes; and emphasizing the importance of organization-wide participation and teamwork' (Lakshman, 2006, p 56). A necessary skill for leaders is the ability to communicate the core values of the organization to all co-workers, such as the values related to customer focus, teamwork, and continuous improvement (ibid). When leaders want to improve their leadership skills and are striving for business excellence, there is a 'need for intensive and ongoing dialogue on issues such as vision, strategy, and objectives based on appropriate feedback information' (Doeleman, Have, and Ahaus, 2012).

An employee satisfaction survey can be used as an evaluation instrument to identify the present status of the organization, as well as a method for creating cultural change, including creating new attitudes, behaviours and ways of working with co-workers (Hartley 2001). An employee satisfaction survey is one management tool that is regularly used to measure co-worker satisfaction and engagement with the intent, among others, of identifying areas of development (de Waal 2014).

Quality management and co-worker health

'Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity' (WHO Constitution, 2016). According to Caplan et al. (2004),

there is no ideal state of health since individuals can always increase their health with suitable activities in different situations. Mackenbach *et al.* (1994) asserted that health can be labelled as a mix of the nonappearance of personal disease, absence of chronic conditions and self-assessed health. Lundqvist *et al.* (2012) asked managers to define health, and their definition was 'having a sense of physical and mental well-being'. Leaders who do not feel well themselves are not able to give their co-workers sufficient support and leadership (*ibid*).

Many researchers maintain a strong connection between co-worker satisfaction and organizational results (Harter, Schmidt, and Hayes, 2002; Chi and Gursay 2009). This assertion is in agreement with Hughes (2007), who claimed that work-life balance has a major influence not only on productivity but also on the economy as a whole. In addition, Vinberg (2006) established that a good working environment is correlated with well-being among co-workers and organizational performance. According to Liu and Liu (2014), QM practices are connected to co-workers' well-being in a positive way, meaning that QM can help co-workers increase their sense of belonging and satisfaction but also decrease their work stress and work overload (*ibid*). Consequently, health problems negatively affect productivity, as well as the quality of products and services.

Interest in the connection between QM and co-worker health seems to have increased in recent years. At an earlier stage, the focus within QM was on external customer satisfaction and continuous improvement (Bäckström, 2009). However, co-workers are now seen as internal customers by many authors in the area of quality; thus, their satisfaction and well-being should be considered in QM practices (*ibid*). QM has a solid participative element, where every co-worker in the organization should be involved (Sila and Ebrahimpour, 2002; Bergman and Klefsjö, 2003). This assertion is well in line with the research in the health field, where the demand-control-support model includes the importance of co-workers being able to control their own work situation as a main focus (Karasek and Theorell, 1990). Wreder (2008) found that the QM value 'Management Commitment' was a reinforced value and was very important for the values 'co-worker involvement', 'focus on customer' and 'continuous development' when working with co-worker health. This finding is in line with Lagrosen (2004), who presented a correlation between co-workers' self-reported health and the QM values 'Leadership Commitment' and 'Participation of Everybody'. Furthermore, Bäckström, Larsson and Wiklund (2009) found that organizations that had established high co-worker health and low absence due to sickness were also practising QM. The presence of leadership behaviours in accordance with the QM values 'Leadership Commitment' and 'Participation of Everybody' has been shown to correlate with the co-workers' perception of their health (Lagrosen, Bäckström and Wiklund, 2012). Some researchers have described how QM can be practised and focused on the most important values within QM when attempting to improve health among co-workers (Bäckström, 2009; Lagrosen *et al.*, 2010). The QM values 'Leadership Commitment' and 'Participation of Everybody' were found to be vital for supporting health among co-workers when QM is practised (Bäckström, 2009; Lagrosen *et al.*, 2012).

A health-related quality management survey

Most measurements have focused on financial figures or other 'hard' measurements, such as the cost of quality, reduced inventory and delivery performance, when measuring organizational effectiveness and success (Motwani, 2001; Hansson and Eriksson, 2002 and Hendricks and Singhal, 1999). Although organizational culture and values are mentioned as factors for success in QM, a measurement of the soft values seems to be missing but is necessary (Ingelsson *et al.*, 2010). One aim for the measurement of soft values is to identify the values that managers hope will permeate the organization (Bäckström *et al.*, 2012b).

According to Theorell and Vogel (2003), self-reported health is a valuable way of measuring co-worker health. Although one worry with self-reported health is that the respondents do not perceive the scale as absolute (Jürges, 2007). Conversely, respondents assess their true health when they answer survey questions (Crossley and Kennedy, 2002).

Lagrosen *et al.* (2010) elaborated on the underlying dimensions of the health-related QM values 'Leadership Commitment' and 'Participation of Everybody'. They established that integrity, presence and communication, empathy and continuity are underlying dimensions of the health-related QM value 'Leadership Commitment'. The underlying dimensions of the health-related QM value 'Participation of Everybody', they discovered, were development, being informed and influence. This finding was illustrated by Ingelsson and Bäckström (2017) and is illustrated in Figure 1. The underlying dimensions include recognized methodologies, leadership behaviours, and values and practices in organizations that have successfully achieved a healthy environment in the workplace, such as excellence in leadership, a good work environment, co-worker health and co-workership, along with improved profitability (Bäckström, 2009).

Insert Figure 1 here.

'Integrity' comprises the manager's own characteristics, such as independence, trustworthiness and fairness (Lagrosen *et al.*, 2010). 'Presence and Communication' signifies that the managers practise clear leadership and communicate clearly. 'Empathy' indicates that the managers show consciousness and concern and are alert to the needs of the co-workers and understand their conditions. 'Continuity' suggests that the manager should remain in the same position for a long time to be able to build trust with their co-workers (*ibid*). In the underlying dimension of 'Development', skills and personal development for the co-worker are included. 'Influence' covers the ability of co-workers to influence their own working conditions. The last dimension is 'Being Informed', and it reflects communication in general and especially having enough information (*ibid*). Lagrosen *et al.* (2012) developed a survey based on the dimensions described above with the purpose of measuring the soft QM values 'Leadership Commitment' and 'Participation of Everybody' and co-worker health (see Table I).

Insert Table I here.

The survey has been implemented and tested in several research studies (Bäckström, Eriksson and Lagrosen, 2012a; Bäckström, Eriksson and Lagrosen, 2014a; Bäckström *et al.*, 2012b; Åslund, Bäckström and Richardsson, 2011). The survey can be used to establish the extent to which the leaders in the organization are practising the health-promoting values of QM and in which areas improvement is needed (Bäckström, 2009 and Lagrosen *et al.*, 2012). The survey can also be used to measure the status before and after an organizational improvement initiative (Lagrosen *et al.*, 2012). It has been used to measure the effects of the QM values of health-promoting activities (Bäckström *et al.*, 2012a) and to evaluate the effects that Appreciative Leadership has on a QM initiative (Åslund *et al.*, 2011).

In one research study, the dimensions of health-related QM values in relation to the key principles of communicative leadership were examined, and the results show that there is a relationship between the two (Bäckström, Ingelsson and Johansson, 2014b). Another study showed that managers' views of communicative leadership are supported by most of the underlying dimensions of health-related QM values (Bäckström, Ingelsson and Johansson, 2016). A modified and improved version of the survey has been used to measure Lean values

and the health-related QM values ‘Leadership Commitment’ and ‘Participation of Everybody’ in two manufacturing companies (Ingelsson and Bäckström, 2016).

Methodology

In 2015, a project was initiated to explore how quality can be enhanced in Swedish businesses by developing an internal coaching process to support value-based leadership development. The three-year project, financed by The Knowledge Foundation, is a research and development partnership consisting of three Swedish manufacturing companies and Mid Sweden University. During the first year of the project, baseline data were collected to understand and describe the culture and leadership of the three participating companies. In two of the participating organizations, one part of the baseline collection was to use a survey that measures the health-related Quality Management values, perceived health and Lean values. In this study, the part of the survey that measures health-related QM values and perceived health was used and analysed. The survey was not used in the third company because they implemented a different survey that was not comparable with the survey used by the other two companies. In some studies, the underlying dimension, continuity, did not correlate strongly with the co-workers’ perception of their health (Lagrosen *et al.*, 2010; Bäckström *et al.*, 2012a). For that reason, it was removed from the survey in this study.

The earlier survey had been validated in several different contexts but measured only co-worker perception; thus, the corresponding statements for managers were altered for the dimensions of the health-related QM values ‘Leadership Commitment’ and ‘Participation of Everybody’. The early survey was based on both theory and empirical studies as presented in the previous section. The statements for the managers were tested in a pilot study and adjusted after feedback. The survey was modified in order to be able to compare the co-workers’ perception with the managers’ perception and to give the organizations basic data for development and discussion.

The relationships between the statements and the QM values are presented in Tables II and III, with statements for both the co-workers and the managers. This is to increase the validity and the transparency and to enable other researchers to use the same statements and method. In this paper, the statements and the test of internal consistency reliability, as well as the results from the measurement of the health-related Quality Management values and health index from both co-workers and managers, for the two participating organizations are presented. Both companies are manufacturing companies located in Sweden. They were selected for this study because they agreed to participate in the research project. They are both subsidiaries of international groups of companies and have a manager who is stationed at the plant. Both companies are performing well financially. Company A has very good delivery performance, while Company B is struggling in this area.

To ensure validity, the same statements have been used in the two companies but the data were collected from the two companies in different ways. For Company A, the questionnaire was distributed via a web-based solution, and the co-workers and managers had the opportunity to answer it during a two-week period. The questionnaire was promoted during daily meetings on several occasions. Out of 85 staff members, 54 co-workers answered the questionnaires, but only 51 questionnaires were filled in correctly, which gave a response rate of 64% for the co-workers; 4 managers answered, giving a response rate of 100% for the managers. At Company B, the questionnaire was distributed on paper during a monthly meeting with all co-workers and managers and then was collected at the end of the meeting.

Out of 120 staff, 91 co-workers answered the survey, giving a response rate of 84%, and 12 managers answered, giving a response rate of 100%.

The results of the survey from the co-workers and the managers in the two companies were analysed separately for each company using SPSS. To test the internal consistency reliability for the dimensions, the Cronbach's alpha coefficient was calculated for each of the dimensions, and a value of 0.6 or higher was deemed acceptable for the variables consisting of three statements, as seen in Table IV. The correlations between the dimensions and the health index were investigated using the Pearson correlation, as seen in Table V. Then, the mean and standard deviation were calculated for the two companies, as seen in Table VI and Table VII. Next, a t-test was computed to determine if the differences in the means were statistically significant. The results were then validated by presenting them to the managers' team at both companies where the managers and the researcher discussed and analysed the results together.

The modified and tested survey

The survey statements are presented in Table II and Table III, both the previously developed statements for the co-workers from Lagrosen *et al.* (2012) and the statements for the managers developed in this project. The statements are presented with each related underlying dimension.

Insert Table II here.

The third statement for the underlying dimension, 'Presence and Communication', was the same for the co-workers and the managers since it reflects a condition of the overall company.

Insert Table III here.

Two of the statements reflecting the underlying dimension, 'Being Informed', were phrased identically for the co-workers and the managers since the first considers the whole company and the second is about information between departments.

The health index contains the self-reported health information and is the same for the co-workers and managers. It was inspired by Lagrosen *et al.* (2012), but the wording was changed so that all statements could be analysed in the same way. The statements for the health index are as follows: a) I am almost always healthy, b) I am usually energized, and c) I think my health is very good.

The results from the internal reliability test for each dimension and the health index in both companies showed a satisfactory value for the Cronbach's alpha coefficient. All dimensions were between 0.691 and 0.895 except for the dimension 'Influence' in Company B, which had a Cronbach's alpha value of 0.586, as seen in Table IV. Although it is below 0.6, it is near the limit; therefore, the comparison between the managers' and the co-workers' perception of the presence of the dimension within the organization was calculated.

Insert Table IV here.

The correlations between all the dimensions and the health index for the co-workers and the managers were calculated for the companies to test the correlation in this context. The results are presented in Table V. All correlations between the dimensions and the health index are positive and vary from 0.252 to 0.531 in the companies, and the correlations were significant.

A correlation test between the dimensions shows a positive significant correlation from 0.486 to 0.833 for Company A. In Company B, the correlation between the dimensions varies between 0.621 and 0.853, where the highest occurs between the dimensions Presence and Communication and Integrity. The weakest correlation is between the dimensions Influence and Being Informed in Company A. As the correlations were just a simple test, the results are not shown in a table.

The results of the correlation tests between the dimensions and the health index are presented in Table V. The correlation is weaker than the correlations within the dimensions, but all are positively statistically correlated and significant except for the dimension Being Informed in Company A. All of the other dimensions in Company A vary from 0.357 to 0.571, which is considered a medium correlation. In Company B, all dimensions are positively statistically correlated and vary from 0.465 to 0.531, which is considered a large to a medium correlation, according to Cohen (1988), as seen in Table V.

Insert Table V here.

The comparison between co-workers' and managers' perceptions

The mean values and the standard deviation were compared between the co-workers and the managers in the two companies. The results for Company A are presented in Table VI, and the results for Company B are in Table VII.

Insert Table VI here.

All mean values were higher for the managers than for the co-workers at Company A. The Integrity dimension has the largest difference in mean values between co-workers and managers, and the Being Informed dimension has the smallest. The standard deviation shows that the variation is higher for co-workers than for managers. The difference between the mean values was statistically significant for all dimensions within the health-related QM values. The difference between the mean values of the Health index was not statistically significant for Company A.

Insert Table VII here.

Additionally, at Company B, all mean values were higher for the managers than for the co-workers. The standard deviation shows that the variation is higher for co-workers than for the managers, such as with Company A. The differences between the mean values between managers and co-workers in Company B were statistically significant in all dimensions within the health-related QM values except for the Influence dimension. The greatest difference between co-worker and manager perception was within the Empathy dimension, and the smallest was within the Being Informed dimension. The difference between the means of the Health index was also not statistically significant in Company B.

The results and the comparisons between co-worker and manager perceptions of QM values can help managers detect areas for improvement. In both companies, there is a higher mean value for the managers than for the co-workers. This outcome is an indication that there is a difference in viewpoints regarding the presence of the QM values within the organizations and therefore a different perception of the existing culture. For example, in Company A, the results show that managers state that they keep their promises, act in a manner worthy of imitation and that they are fair to a higher extent than co-workers perceive them. This finding can give the managers information about how they are perceived and in what areas they can improve if they want to work according to the health-related QM values. In Company B, the

managers think that they see their co-workers, give them support, understand the co-workers' situations and give them attention when they have done a good job, but the co-workers do not agree to the same extent. This result gives the managers in that company an indication as to where they can start working to change their behaviours and the culture within the organizations.

Discussion

The results from such a measure can help managers discover the gaps between co-worker perceptions and their own. When gaps are observed, they can be discussed and reduced. This outcome is in line with Bitici *et al.* (2006), who maintained that managers need to understand the connection between the measure and the organizational culture to be able to increase quality development. This way of measuring both the co-workers and the managers' perceptions is a step to understanding the current culture. By analysing the results both quantitatively and qualitatively, the managers can have a baseline from which to begin the improvement. One way to begin the improvement process is to use the information received to communicate and discuss the gaps and ideas for what can be done. To be able to do this, Bäckström *et al.* (2016) maintain that the managers must feel good about themselves and had training in how to communicate. This finding is in accordance with Lundqvist *et al.*, (2012) who sustained that leaders have to have good health themselves to be able to offer their co-workers sufficient support and guidance.

Wreder (2008) demonstrated that successful organizations practised the measured values in their QM work. The fact that the managers think they are performing, behaving and acting similar to committed leadership to a greater extent than the co-workers do adds a new way of seeing the leadership. Viewing the leadership from the co-workers' perspective compared with the managers' perspective provides novel insight for both the researcher and the managers. Furthermore, the study shows a different view regarding the ability for co-workers to participate, which gives us a deeper understanding of the complexity involved in allowing everyone to participate. Arunachalam and Palanichamy (2017) emphasized training for managers to reach satisfaction and commitment among co-workers.

According to Bäckström (2009), there are several approaches that managers can take to increase co-workers' perception of the health-related QM values 'Leadership Commitment' and 'Participation of Everybody'. The suggestions are that the managers should do the following:

- Try to truly understand the co-workers and their work situation;
- Behave as role models, be fair and keep their promises;
- Try to be present and accessible for co-workers and communicate with them;
- Give the co-workers opportunities to develop their skills and develop personally;
- Allow co-workers to affect their work situation and take suggestions from them seriously; and
- Develop good communication within the whole organization (*ibid*).

These suggestions are in agreement with Doeleman *et al.* (2012), who emphasized an energetic and continuing dialog when managers want to improve their leadership. As managers have a great influence on the organizational culture through their behaviour (Schein, 2004), they must behave according to the predominant culture they want to have within the organization. The managers in the companies studied were given presentations on

the results and suggestions for how they can improve. Company A decided to restructure the organization and have shift managers for some positions. Then, this change will need to be taken into consideration when new measures are pre-formed. Company B is working with improvements connected to their strategic plan and believes that this approach will also improve these areas. One goal in their strategic plan is to have healthy co-workers. Thus, the results of the evaluation and the suggestions for behaviours must be taken seriously. If they had decided to work with the manager's behaviours and improve how the managers communicate as presented above, the results would probably have been better according to the quality of the culture and the health among the co-workers. As Zelnik *et al.* (2012) found in their study, there is a strong connection between overall satisfaction and 'Communication in the Company' and 'Motivation of the Employees'.

Researchers have an ethical duty to administer surveys honestly and professionally, with an awareness of the context within which the analysis is taking place (Hartley, 2001). This assertion is in line with Ingelsson and Bäckström (2016), who claimed that it is important to take every specific organization's context into account when the results are analysed. They also claim that an in-depth analysis is important to truly understand the results in each context (ibid). Snyder *et al.* (2016) view a survey as a simple tool to manage. However, while the results deliver a summary about an issue, they do not deliver any deep insights about the organization. This limitation also emphasizes the need for a deep analysis of the results in every specific context, and it also means that the results are just a way to help the managers understand where the improvement work can begin. Conversely, Hartley (2001) sees that a survey can also serve as a method for creating a cultural change and practice in organizations. In this case, there were not a large number of managers employed but they all answered the survey which gave a response rate of 100%. This will probably be common in other cases as there have to be big companies if you should have many managers filling in a survey.

Thus, enacting quality practices related to the underlying dimensions can help to increase the health of co-workers in the organization, as earlier research has shown (Wreder, 2008; Lagrosen *et al.*, 2010; Bäckström 2009), although there are, of course, other factors affecting co-worker health. Implementing the health-related QM values may also help to strengthen the quality of the culture within organizations. At the same time, it is important that both the co-workers and the managers are healthy, since health is extremely valuable for organizations (Jiménez *et al.*, 2017).

The difference in the mean values between the managers and the co-workers was not statistically significant for the health index. The statements for the health index are the same for both the co-workers and the managers, so they are actually answering in regard to their own health. There are also three statements in the survey that are worded the same for the co-workers and the managers. One covers the health-related QM value 'Leadership Commitment', and two cover the value 'Participation of Everybody'. These statements consider the whole company and the flow of information between the departments. In these areas, the managers have a more positive opinion than the co-workers do. This finding is an interesting result and creates questions such as are the managers simply more loyal to the company, or could there be another reason?

Conclusions

The results demonstrate that the managers' perception of the presence of the health-related QM values within the companies is higher than that of the co-workers, and the differences

were statistically significant for all dimensions except for 'Influence' in Company B. Then, it can be concluded that the managers in both the examined companies believe that they are providing committed leadership and are promoting participation to a higher extent than the co-workers think they do. This conclusion shows that there are areas for improvement in both companies according to the health-related QM values.

There is a strong positive significant correlation within all the dimensions; therefore, it can be concluded that an improvement initiative that focuses on one of them would probably help to increase another dimension.

All dimensions had high values when the Cronbach's alpha coefficient was computed except for the Influence dimension in one of the companies. This outcome could indicate that the statements in the survey need to be changed for that dimension to better measure it. The statements that had the least consistency were 'I can take a short break from my work if needed' for the co-workers and 'My co-workers can adapt working hours if necessary' for the managers. Before any changes are made to the statements, the survey should be tested in other contexts since the Cronbach's alpha reached the limit of 0.6 in one of the companies and reached it in earlier evaluations. However, in those evaluations, only the co-workers participated in the survey.

The correlation between the dimensions suggests that the health-related QM values and the health index were determined to be reasonably positive and significant for all dimensions except for the 'Being Informed' dimension in one of the companies. However, the results will be different in different contexts, which further emphasizes the importance of analysing every measure and organization more deeply.

It can be concluded that the modified survey can be used as a starting point in order to detect areas of improvement. But when a study such as this has been conducted, it is important that the managers inform the co-workers about the results and invite the co-workers to participate in a dialogue and discussion. Another conclusion is that there is a positive relation between all of the dimensions and the co-worker and manager perceptions of their health. This conclusion emphasizes the importance of working according to the QM values 'Leadership Commitment' and 'Participation of Everybody' if healthy co-workers is the target.

Limitations and future research

The survey was conducted in two organizations, which had 16 managers between them. This approach gave a 100% response rate, but the number of managers who filled in the newly developed statements was small. Testing the adapted survey with managers in a larger company with more managers would be beneficial for future research. Then, the gap between the managers and the co-workers can be more deeply investigated. The measure presented in this paper does not provide deep insight into the culture of the organizations, but a future study could further examine the organizations to obtain a more comprehensive understanding of the companies.

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Figure 1. The relationship between QM values and underlying dimensions affecting co-worker health. Ingelsson and Bäckström (2017).

Tables

Table I Description of underlying dimensions of the QM values Leadership Commitment and Participation of everybody after Lagrosen et al., 2010.

QM Values	Underlying dimensions	Description of the underlying dimensions
Leadership Commitment	Integrity	the manager's own characteristics such as independence, trustworthiness and fairness
	Presence and Communication	the managers practice a distinct leadership and communicate clearly
	Empathy	the managers must show consciousness and concern and must be alert to the needs of the co-workers
	Continuity	the manager should stay in the same position for a long time to be able to build up trust with the co-workers
Participation of Everybody	Development	skills and personal development for the co-worker
	Influence	co-workers' possibility to influence their own work conditions
	Being informed	communication in general and especially having enough information

Table II Statements to the co-workers from Lagrosen et. al (2012) and the developed statement for the managers in the survey, reflecting the underlying dimensions for the QM value Leadership Commitment.

Statements for the health-related QM value Leadership Commitment		
Dimensions	For co-workers	For managers
Empathy	I am seen and I get support from my managers.	I see my co-workers and give them support.
	It feels as though my managers understand my working situation.	I understand my co-workers' working situation.
	We get attention from our managers when we have done a good job.	I give my co-workers attention when they have done a good job.
Presence and communication	In our organization, managers show an active interest and visible commitment.	My commitment is active and visible.
	Managers communicate in a good and explicit way.	I communicate with my co-workers in a good and explicit way.
	Co-workers are not afraid to express their opinion.	Co-workers are not afraid to express their opinion.
Integrity	Managers keep their promises to us.	I keep my promises.
	Managers act in a manner worthy of imitation: they set good examples.	I act in a manner worthy of imitation and set good examples.
	Managers are fair, e.g., everybody has opportunities for further development.	I treat all fairly, e.g., everybody has opportunities for further development.

Table III Statements to the co-workers from Lagrosen et. al (2012) and the developed statement to the managers in the survey reflecting the underlying dimensions for the QM value Participation of everybody.

Statements for the health-related QM value Participation of Everybody		
Dimensions	For co-workers	For managers
Development	I have good opportunities for personal development.	My co-workers have good opportunities for personal development.
	I get enough opportunities to develop my skills.	My co-workers get enough opportunities to develop their skills.
	The “development appraisals” I have with my managers feel meaningful.	The “development appraisals” I have with my co-workers feel meaningful.
Influence	I feel that I can exert influence on my working situation.	My co-workers can exert influence on their working situation.
	I can take a short break from my work if needed.	My co-workers can adapt working hours if necessary.
	Suggestions and proposals from co-workers are taken seriously.	I take suggestions and proposals from co-workers seriously.
Being informed	There is good communication within the company.	There is good communication within the company.
	I feel that I get enough information from my managers.	I give my co-workers enough information.
	There is good information exchange among the departments.	There is good information exchange among the departments.

Table IV. Cronbach Alpha for the health-related Quality Management values and the health index in Company A and Company B.

QM Values	Dimensions	Cronbach Alpha Company A	Cronbach Alpha Company B
Leadership Commitment	Empathy	0.895	0.844
	Presence and communication	0.779	0.801
	Integrity	0.820	0.791
Participation of Everybody	Development	0.849	0.844
	Influence	0.691	0.586
	Being informed	0.735	0.773
Health index		0.758	0.818

Table V. The results of the correlation test between the health index and the underlying dimension of the health-related QM values.

QM Values		Dimensions	Company A		Company B	
			Pearson	Sig.	Pearson	Sig.
Leadership Commitment		Empathy	0.422**	0.001	0.531**	0.000
		Presence and communication	0.440**	0.001	0.519**	0.000
		Integrity	0.381**	0.004	0.507**	0.000
Participation of Everybody		Development	0.571**	0.000	0.450**	0.000
		Influence	0.357**	0.007	0.466**	0.000
		Being informed	0.252	0.064	0.465**	0.000

Table VI. Mean values and standard deviations for Company A.

Values	Dimensions	Company A			
		Co-workers		Managers	
		Mean	St dev	Mean	St dev

Leadership Commitment	Empathy	3.50	1.48	5.50	0.79
	Presence and communication	3.87	1.38	5.67	0.86
	Integrity	3.47	1.50	5.50	0.43
Participation of Everybody	Development	3.06	1.45	5.08	0.96
	Influence	3.72	1.39	5.50	0.84
	Being informed	3.19	1.21	4.50	0.43
Health index		4.77	1.42	5.58	0.69

Table VII. Mean values and standard deviations for Company B.

QM Values	Dimensions	Company B			
		Co-workers		Managers	
		Mean	St dev	Mean	St dev
Leadership Commitment	Empathy	4.31	1.46	5.83	0.59
	Presence and communication	4.50	1.41	5.31	0.59
	Integrity	4.23	1.45	5.64	0.64
Participation of Everybody	Development	3.79	1.46	5.06	0.56
	Influence	4.52	1.31	5.31	1.04
	Being informed	3.27	1.22	4.06	0.66
Health index		5.10	1.45	5.75	0.64