



Research Article

Dashboard Indicators for Applications in Workplace Health Promotion

Dunkl A* and Jiménez P

Abstract

The integration of ICT-solutions has a big potential to raise effectiveness and popularity of projects in the area of workplace health promotion (WHP). A growing list of hardware and software solutions to promote individual health have been developed which are mostly targeting individual health promotion. However, these solutions are very seldom adapted to support the comprehensive approach used in WHP. ICT-solutions can support in various ways. One possible way would be to depict organizational and individual parameters (such as the employees' physical exercise, job satisfaction or motivation) on a feedback page ("dashboard"). On this dashboard, important WHP indicators can be presented with simple graphical representations. The present study aimed to identify indicators (individual indicators as well as indicators of the working environment) which might influence the opinion of dashboard contents in WHP projects. To answer our research question, the data of 362 Austrian and German leaders was collected in an online study. The findings showed that the leaders' individual app usage was stronger related to possible dashboard contents than workplace indicators. Specifically, leaders interested in using apps to improve their leadership skills were more interested in dashboard contents depicting health parameters of their employees and contents depicting organizational parameters (e.g., job satisfaction, motivation). The results give more insight in the possible integration of ICT-solutions to support health at the workplace. Including dashboard designs in these solutions could be an interesting approach to support the leaders (e.g., the management) in the organization.

Keywords

Application; Dashboard; Health promotion; Workplace

Introduction

Workplace health promotion (WHP) projects in organizations are one of the keys for improving health in organizations [1]. The right implementation of WHP projects is a crucial point for their success. Therefore the administration of the whole project has to be done in a very highly qualitative way to reach the sustainability of the interventions. The integration of ICT-solutions (such as web-portals, smartphone applications "apps", sports tracking devices, etc.) has a big potential to raise effectiveness and popularity of WHP projects.

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There is a growing list of hardware and software solutions which are mostly targeting individual health promotion, but they are very seldom adapted to support the comprehensive approach used in WHP. The modern way of WHP comprises the whole package of analysing the structures and procedures in the company as well as giving advice to change individual behaviour and organizational structures.

One advantage of implementing ICT-applications to health promotion processes is the possibility to deliver instant feedback and support [2,3]. Instant feedback supports users to monitor their personal progress and can motivate users to look after their individual health. Instant feedback and support can be provided in many ways, e.g. personalized e-mails, instant messaging communication or even phone and face-to-face meetings [3]. However, the major advantage lies in feedback that is instantly calculated and returned to the user.

Giving feedback about the employees' health, satisfaction, performance and motivation is seen as a core element in WHP projects. This is usually done by experts writing a comprehensive feedback report based on the results of the survey which has been conducted in the company. ICT-applications can support transferring the survey responses in WHP projects into feedback pages automatically. This comprehensive feedback page – which can be also called "dashboard" – summarizes the collected WHP indicators for the whole organization and ideally presents them in a clear and concise way with simple graphical representations (e.g., traffic lights, barometers, profiles). WHP projects have to include assessments of personal health factors (such as physical exercise, nutrition, smoking, etc.) as well as working conditions; therefore the dashboard has to include both aspects.

Therefore, an important point concerns which aspects should be included in a feedback/dashboard to help managers in the WHP process. To get an insight to these questions a study with leaders was conducted. Leaders are seen as important promoters of health at the workplace and are important key factors for successful WHP activities [4,5]. In WHP projects, leaders are able to positively influence employee health by supporting health promotion programs and policies [6]. In addition, leaders are responsible for providing the needed infrastructure to support WHP activities, such as financial, temporal and professional resources [7].

The present study aimed to identify indicators (individual indicators as well as indicators of the working environment) which might influence the opinion of dashboard contents in WHP projects. WHP projects have to include assessing individual health factors as well as organizational factors. Therefore, both aspects should be included ideally in a dashboard.

Materials and Methods

Recruitment and selection of participants

In cooperation with a German market research company, Austrian and German leaders were invited via e-mail to participate in an online study. The participants had to fulfil the requirement of currently having an official leading position in their company; otherwise they were excluded at the beginning of the survey. All-in-all 362 data sets could be collected and were used for statistical analyses.

Participants

In this sample of 362 leaders, 40.9% were working in Germany and 59.1% were working in Austria; 31.2% were female and 68.8% were male. In average, the participants were 43 years old (M=43.2, SD=10.01) and worked in different business sectors, mostly in the business sectors service/consulting (15.2%), manufacturing (14.9%) and commerce (12.4%). The majority of the leaders worked in lower management (63.8%), the rest worked in the middle management (28.5%) and top-management (7.7%). Almost every participant (90.6%) had a smartphone which is used regularly.

Measurements

The working environment was measured with the OrgFit [8]. The OrgFit assesses four aspects of mental workload at the workplace in line with international standards [9]: 1) work activities and tasks, 2) social environment, 3) work environment, and 4) work flow and organization. The 54 items can be answered on a 6-point Likert scale ranging from 0 (never) till 6 (always). The Cronbach Alpha for the dimensions range between .71 and .90.

Questions including different dashboard possibilities in workplace health promotion projects as well as the personal interest of using different app contents were measured with scales previously developed for this study. The items can be obtained from the corresponding author on request.

The different dashboard possibilities in workplace health promotion projects were measured with nine items. The items refer to possible dashboard contents, e.g. “statistics about my team’s nutrition habits” or “feedback to my team’s job satisfaction”. The items could be answered on a five-point Likert scale from 1 (not interesting) to 5 (very interesting). An exploratory factor analysis using principal axis factoring and oblimin rotation was performed to assign the nine items to higher-order factors. The results showed a two-factor solution and the factors were named 1) feedback about physical health of the team (four items; Cronbach Alpha: .93) and 2) feedback about organizational indicators (five items; Cronbach Alpha: .96).

The interest of using different app contents contained ten possible contents for a health promotion app and eight possible contents for a leadership-app. The instruction sentence was “What elements of a smartphone app in the field of health promotion would you probably use?” and “What kind of apps would you use to manage your leadership tasks?”, respectively. The possible contents for the health promotion app could be rated on a five-point Likert scale from 1 (never) to 5 (daily). The possible contents for the leadership app

could be rated on a five-point Likert scale from 1 (not interesting) to 5 (very interesting). An exploratory factor analysis using principal axis factoring and oblimin rotation was performed to assign the 18 contents to higher-order factors. This resulted in four dimension, which were named: 1) personal health (using an app to track personal health, seven items, Cronbach Alpha: .93), 2) contacting (using an app to get in contact with others, three items, Cronbach Alpha: .83), 3) key figures (using an app to track corporate key figures, three items, Cronbach Alpha: .92) and 4) leadership feedback (using an app to improve leadership skills, five items, Cronbach Alpha: .95).

In the present paper, we aimed to identify indicators (individual indicators as well as indicators of the working environment) which might influence the opinion of dashboard contents in WHP projects. WHP projects have to include the individual as well as the organizational approach. Therefore, both aspects should be included in a dashboard.

Results

To investigate our research question, hierarchical multiple linear regression analysis was conducted separately for both possible dashboard designs (“feedback about physical health of the team”, “feedback about organizational indicators”). The tested variables are normally distributed. Multicollinearity was checked with the variance inflation factor (VIF) and could not be found in the present data.

Table 1 presents the steps of the analysis with their respective adjusted R2 (ΔR2), standardized regression coefficients and p-values. The workplace indicators were put into the equation first. The second step of the model included the indicators about possible individual app usage.

For the criterion “feedback about physical health of the team”, all four workplace indicators did not show significant relationships. Regarding the app usage indicators, the app contents “contacting” and “leadership feedback” were found to be significant predictors (β=.28 and β=.22, respectively).

For the criterion “feedback about organizational indicators”, the working environment dimensions “social environment” and “work flow and organization” were significantly related to this outcome criteria (β=-.17 and β=.18, respectively). The only app-content that showed to be a significant predictor was “leadership feedback” (β=.56).

Discussion

Looking at our results we can identify different views from the leaders to these feedback possibilities. The individual topics, in our

Table 1: Results of the multiple regression analyses (standardized regression coefficients from the last step).

	Feedback about physical health of team			Feedback about organizational indicators		
	β	p-value	ΔR ²	β	p-value	ΔR ²
Step 1: workplace environment			.00			.04**
OrgFit: work activities and tasks	.01	.840		.03	.600	
OrgFit: social environment	.00	.998		-.17**	.006	
OrgFit: work environment	.10	.100		-.01	.815	
OrgFit: work flow and organization	-.08	.268		.18**	.007	
Step 2: app usage			.25**			.34***
App: personal health	.04	.581		.08	.200	
App: contacting	.28***	<.001		.07	.257	
App: key figures	.12	.062		-.11	.069	
App: leadership feedback	.22**	.001		.56***	<.001	

Note: N=362; ΔR²: adjusted R²; *** correlation significant (p<.001) ; ** correlation significant (p<.01) ; * correlation significant (p<.05) ; high values in the questionnaire OrgFit indicate a more stressful working environment

study represented by the feedback about physical health of the team were assessed by the leaders as important only in regard to their usage of smartphone apps. We could see that the factors “contacting” and “leadership feedback” are significant predictors for this dashboard dimension. Leaders which are interested in these factors also have a higher interest in the individual health aspects of WHP in a dashboard design. As the individual approach is one of the important approaches we have to consider for successful WHP [1], one conclusion is that possible apps in that field especially should consider the social (contacting) and feedback-giving (leadership feedback) factors in the design.

The next-and in the long run more important [7]-aspect in WHP is the organizational approach (especially feedback about organizational indicators), which gives more differentiated insight. Here the factor “leadership feedback” is an important predictor for this dashboard indicator as well. Leaders are a key factor for the success of WHP [2-4] and they also need to have the possibility of getting feedback about their behaviour. This could be confirmed by the high weight of this factor. Leaders interested in improving their leadership skills want to get feedback about their team’s satisfaction and motivation, as these indicators can be seen as direct outcomes of their leadership behaviour.

The workplace factors show differentiated results. For “social environment” and “work flow and organization” we found smaller but still significant contributors/predictors for organizational indicators in a dashboard. This can be seen in line with the previous findings as these work aspects include social interactions. These factors can support leaders to improve the work design [7]. The negative weight of “social environment” implies that leaders which evaluate their social environment as being very stressful (e.g. support, interaction, appreciation of colleagues and leaders) are less interested to get feedback about these social aspects in the team. It has to be kept in mind that we asked leaders and so this can be seen partly as a reaction to avoid self-threat. Collecting mainly self-enhancing feedback seems to be especially strong in the organizational context, where positive feedback is more likely to be accepted than negative feedback, even if the negative feedback corresponds with reality [10]. Leaders are

strongly encouraged to support the community at the workplace, therefore feedback about conflicts and critical communication could be seen as self-threatening.

To conclude the results, we can see that a dashboard is important and supports WHP processes. A dashboard can support especially leaders which are the drivers for successful WHP. They are interested in getting feedback, especially for organizational indicators, especially if these indicators help them to improve their leadership skills.

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