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## Original Article

# Is Work Group Social Capital Associated With Sickness Absence? A Study of Workplace Registered Sickness Absence at the Work Group Level



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## ABSTRACT

**Background:** The concept of social capital has its focus on cooperative relations in the workplace. This study investigates the association between social capital and sickness absence among workers in 41 work groups in the Danish dairy industry and examines the possible effects of an intervention on social capital in the workplace on sickness absence.

**Methods:** A sample of 791 dairy workers working in 41 work groups that participated in an intervention study on social capital filled in a questionnaire on four subtypes of social capital, and social capital scores from individual participants were aggregated to the level of work groups. Sickness absence was measured at the level of work groups in company registers as the two-year average percentage of working time lost to sickness absence. Group-level associations between social capital and sickness absence were analyzed using multilevel linear regression analysis. Analyses were adjusted for age, gender, group size, and random effects at the workplace level.

**Results:** We found statistically significant associations between social capital within work groups, social capital in relation to the immediate manager, and social capital toward the workplace as a whole on the one side and sickness absence on the other side. We found no support for any effects of the intervention on sickness absence.

**Conclusion:** The work group level of social capital is associated with the work group level of sickness absence. However, the intervention to enhance group-level social capital had no effect on reducing sickness absence in the intervention group.

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## 1. Introduction

Sickness absence is associated with costs for both individuals and workplaces and societies, and prevention of sickness absence may contribute to enhance the well-being of individuals [1], while simultaneously contributing to ensure adequate supplies of labor for workplaces and societies [2]. Previous studies indicate that adverse psychosocial working conditions, such as low job control, poor quality of leadership, and low social support predict increased risk of sickness absence in workers [3,4]. These findings indicate that social relations in the workplace are important predictors of sickness absence in workplaces.

Over the past decade, the concept of social capital has risen to prominence within the field of psychosocial work environment

research. The concept of social capital in the workplace refers to actual and potential resources in social relations [5–7], for instance, in the workplace. Social capital, therefore, has its focus on different types of formal and informal networks in work settings that provide opportunities for participation, social support, and reciprocity, which again make it possible for employees to coordinate their actions in their common effort to get the job done [8,9].

According to the job demands–resources model [10,11], resources in the psychosocial work environment are described as those aspects of the job that (1) reduce job demands and the associated physiological and psychological costs, (2) are functional in achieving work goals, [and/or] (3) stimulate personal growth, learning, and development [11: 296]. Social capital in the workplace qualifies as a job resource, as previous research indicates that

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social capital is positively associated with job performance, as well as psychological well-being [12]. On this basis, we expect that high levels of social capital will be associated with a reduced risk of sickness absence, and these expectations are supported by findings from previous studies that found that low social capital in the workplace was associated with a series of adverse outcomes related to somatic [13,14] and mental health [15–17].

Previous studies have investigated the association between social capital in the workplace and sickness absence, and these studies provide mixed evidence. Some studies provide evidence that supports the association between high levels of social capital in the workplace and a reduced risk of sickness absence [18–20], while other studies provide little or no evidence in support of this hypothesized relationship [21,22]. The cited studies, however, differ in several respects. First, four of the cited studies used a one-dimensional measure of social capital in the workplace [18,20–22], while one study used a two-dimensional measure of social capital, measuring social capital between coworkers and social capital between coworkers and their supervisors [19]. Second, the cited studies differ in terms of the level of measurement of social capital as some studies have measured social capital at the individual level [21], while other studies have deployed group- [18–20] or organizational-level [22] measures of social capital.

In the present study, we deploy a multidimensional measure of social capital, as the social capital in a workplace may manifest itself in different types of cooperative relations. This has led to a distinction between four different types of social capital [23]: social capital within work groups, social capital between work groups, social capital in relation to the immediate manager, and social capital toward the workplace as a whole [8,23]. Following social identity theory [24], it could be argued that more proximal identities would be more salient to the individual than more distal identities. Accordingly, it may be expected that proximal social relations in the workplace, as expressed by social capital within work groups and social capital in relation to the immediate manager are more important determinants for worker well-being – and, hence, risk of sickness absence – than more distal relations in the workplace, as expressed, for instance, by social capital between work groups.

Moreover, at the theoretical level, the concept of social capital may be considered a group-level phenomenon, as social capital cannot be considered a property of individuals but rather a shared property of work groups. In the present study, we deploy a group-level measure of social capital [8,25,26], as it is argued that social capital may be most appropriately measured at the level of work groups.

We collected data for the present study in an intervention study on social capital in the Danish dairy sector. Social capital is considered highly important in industrial production processes in which work teams are interdependent in their execution of tasks, as in the dairy sector.

To sum up, the aim of the present study is to investigate the association between social capital in the workplace and risk of workplace-registered sickness absence among workers in the Danish dairy industry. Moreover, we investigate whether there are any differences in the association between social capital and sickness absence in the intervention group and in the control group.

## 2. Material and methods

The study is based on survey data from an intervention study on Danish dairy workers [27]. A total of six dairies participated in the study. All employees, including management, were invited to participate and received a letter with an invitation to complete the questionnaire online. Participants filled in the questionnaire during

working hours. The data collection took place from June to August 2015, and to ensure the highest possible response rate, reminders were sent out. Participation was voluntary. In the survey, 945 persons were sent a questionnaire, and we received a total of 791 responses (response rate: 83.7%).

We received information on sickness absence from the six dairies that participated in the study. The dairies recorded sickness absence at the level of work groups. Information on sickness absence was based on information on 41 groups. In the survey data, respondents were grouped in 65 work groups with 3 or more employees. Accordingly, some groups in the survey data were merged to ensure correspondence in the group structure in the two sources of data. To investigate the association between social capital in the workplace and risk of sickness absence, we calculated group scores on the four types of social capital for the 41 groups on which we had information on sickness absence.

The study was approved by the Danish Data Protection Agency. In Denmark, however, approval from ethics committees is not required for survey research. Furthermore, participation in the study was voluntary, which implies that written informed consent is not necessary as this consent is implied in individual respondents' voluntary participation.

### 2.1. Predictors

Social capital was measured using a Danish questionnaire on social capital [8,28]. The questionnaire aims to capture social capital as a group-level construct based on individual responses by applying the method of reference shift consensus [29]. The questionnaire consists of four subscales measuring social capital in the workplace: social capital within the team consists of six items (Cronbach'  $\alpha = 0.88$ ). Social capital between teams consists of six items (Cronbach'  $\alpha = 0.95$ ). Social capital in relation to the immediate manager consists of six items (Cronbach'  $\alpha = 0.95$ ). Finally, social capital toward the workplace as a whole consists of three items (Cronbach'  $\alpha = 0.78$ ). The 21 items of the questionnaire are presented in Appendix 1. Participants responded using a five-point Likert-type scale with the following response options ranging from "to a very low extent" to "to a very high extent". For each subscale, items were added into scales, and scales were rescaled from 0 to 100 with high scores indicating high levels of social capital. Results from a confirmatory factor analysis on the same study population shows that the four-factor model has a satisfactory fit to data (Root Mean Square Error of Approximation (RMSEA) = 0.050; Comparative Fit Index (CFI) = 0.972; Standardized Root Mean Square Residual (SRMR) = 0.034) and that the fit of the four-factor model is significantly better than the fit of alternative models with one and three factors [8].

Scores on the four subscales were aggregated to the group level by calculating the group-level average for each of the 41 work groups with three or more employees. In case of nonresponse from employees within work groups, we calculated group means on the basis on the employees that did respond.

Intervention status was assessed from information on whether work groups had developed action plans to enhance social capital or not.

### 2.2. Outcome: sickness absence

We obtained data on sickness absence from the six dairies that participated in the intervention study, and the dairies provided information on sickness absence on all employees in the 41 work groups.

Information on sickness absence percentage was registered on a monthly basis and included both short-term and long-term

sickness absence. It was not possible to distinguish between cases of short-term and long-term sickness absence. We received information on sickness absence for a two-year period and to minimize bias from cases of long-term sickness absence in individual work groups, we decided to calculate the sickness absence percentage for each work group on the basis of the full two-year follow-up period.

Accordingly, the outcome of the study was calculated as the proportion of working time lost to sickness absence over a two-year period in each of the 41 work groups that participated in the study.

### 2.3. Covariates

A previous study indicates that age and gender are associated with risk of sickness absence [30], and we, therefore, adjusted the analyses for average age and gender composition of respondents in each of the 41 work groups. Information on age and gender was collected in a follow-up survey that was conducted in the spring of 2017. Analyses were also adjusted for the number of employees in the work groups.

### 2.4. Statistical analysis

Data were analyzed using linear multilevel linear regression analysis. We chose this mode of analysis because the work groups that participated in the study were nested in workplaces and by taking random effects at the workplace level into account in the analyses – i.e., the effects of differences between workplaces that are not measured by the specific variables [31,32] – we were able to take the lack of statistical independence between the observations into account in the analyses.

In the analyses, we analyzed associations between the outcome variable (average sickness absence percent over a two-year period measured at the level of 41 work groups) and the four subscales on social capital that were aggregated at the level of the 41 work groups. All analyses were adjusted for group size, average age, and gender composition of the work groups, as well as random effects at the workplace level. We analyzed three models in the study. In Model 1, we investigated the association between each of the four subtypes of social capital and sickness absence. In Model 2, we added the intervention status of the individual work groups. In Model 3, we investigated any intervention effects on the

association between social capital and sickness absence, by adding an interaction term (social capital multiplied by intervention status).

Residuals and assumptions of linearity were plotted and visually inspected. Residuals followed a normal distribution and the association between the four subtypes of social capital and sickness absence tended linearity.

The multilevel analyses were performed using SAS, version 9.4, using the MIXED procedure (SAS Institute Inc., Cary, NC, USA). All variables were standardized.

Intraclass correlations (ICC(1) and ICC(2)) were calculated in the basis analyses performed using the ANOVA procedure (SAS Institute Inc., Cary, NC, USA). ICC(1) values above 0.05 indicates that is it appropriate to aggregate variables to the level of groups, and ICC(2) values above 0.70 indicates satisfactory reliabilities of group means [33].

## 3. Results

Table 1 shows descriptive statistics for main study variables. The table shows that the average sickness absence percentage was higher in the intervention group than that in the control group. Table 1 also shows that the intervention group had lower scores on the four subtypes of social capital than the control group.

Table 2 shows that the correlations between the four subscales of social capital range between 0.42 and 0.71. Table 2 also shows that the levels of ICC(1) support aggregation of the subscales at the level of work groups but the ICC(2) level for the subscales social capital within teams and social capital toward the workplace as a whole was lower than 0.70.

In Table 3, the results from Model 1 showed that social capital within teams, social capital in relation to immediate manager, and social capital toward the workplace as a whole was negatively and significantly associated with risk of sickness absence, when adjusted for age and gender composition in work groups, size of work groups, and random effects at workplace level. In Model 2, we entered the interventions status (intervention group vs. control group) of work groups into the analysis and found that social capital within teams and social capital in relation to immediate manager remained significantly associated with risk of sickness absence, while the association between social capital towards the

**Table 1**  
Descriptive statistics for main study variables

Variable	Intervention group (n = 24)	Control group (n = 17)
Mean sickness absence percentage	3.3 (1.9)	1.9 (1.6)
Social capital within teams	68.9 (7.7)	74.3 (7.8)
Social capital between teams (mean (SD))	62.4 (6.6)	67.2 (10.7)
Social capital in relation to immediate manager (mean (SD))	65.6 (9.0)	79.7 (9.3)
Social capital towards the workplace as a whole (mean (SD))	61.7 (3.8)	71.4 (7.9)
Team size (mean (SD))	19.9 (18.5)	13.4 (11.5)
Average age (mean (SD))	45.8 (4.3)	47.6 (4.2)
Average group prevalence of female gender (percent)	27.5	28.5

SD, standard deviation.

**Table 2**  
Intraclass correlations and intercorrelations (Pearson's r) for main study variables

	ICC(1)	ICC(2)	1	2	3	4
1 Social capital within teams	0.11	0.64	—			
2 Social capital between teams	0.20	0.79	0.53	—		
3 Social capital in relation to immediate manager	0.18	0.77	0.56	0.42	—	
4 Social capital toward the workplace as a whole	0.07	0.53	0.53	0.58	0.71	—

ICC, intraclass correlation.

**Table 3**

Associations between four types of group-level social capital and group-level prevalence of sickness absence. Results from standardized multilevel linear regression analyses\*

Predictor	Model 1		Model 2		Model 3		n
	B (SE)	p	B (SE)	p	B (SE)	p	
Social capital within teams	-0.46 (0.13)	0.0014	-0.40 (0.14)	0.0066	-0.49 (0.18)	0.0096	41
Intervention status <sup>†</sup>			-0.42 (0.31)	0.1797	-0.45 (0.31)	0.1598	
Interaction term <sup>‡</sup>					0.26 (0.32)	0.4162	
Social capital between teams	-0.14 (0.16)	0.3775	-0.07 (0.17)	0.6595	-0.06 (0.25)	0.8176	39
Intervention status <sup>†</sup>			-0.52 (0.33)	0.1185	-0.53 (0.33)	0.1208	
Interaction term <sup>‡</sup>					-0.03 (0.34)	0.9369	
Social capital in relation to immediate manager	-0.40 (0.14)	0.0069	-0.36 (0.17)	0.0408	-0.37 (0.20)	0.0802	36
Intervention status <sup>†</sup>			-0.17 (0.37)	0.6472	-0.19 (0.43)	0.6552	
Interaction term <sup>‡</sup>					0.04 (0.41)	0.9179	
Social capital toward the workplace as a whole	-0.41 (0.15)	0.0109	-0.40 (0.21)	0.0665	-0.44 (0.39)	0.2707	36
Intervention status <sup>†</sup>			-0.05 (0.42)	0.9047	-0.04 (0.43)	0.9301	
Interaction term <sup>‡</sup>					0.06 (0.50)	0.9039	

SE = Standard Error.

\* Adjusted for average age and gender composition in each of the 41 work groups, size of work groups, and random effects at workplace level.

<sup>†</sup> Teams that participated in the intervention are modeled as reference.<sup>‡</sup> Interaction terms were modeled as the relevant type of social capital multiplied by intervention status.

workplace as a whole and sickness absence attenuated and lost statistical significance. Intervention status was not significantly associated with sickness absence. In Model 3 in Table 3, we added an interaction term to investigate potential intervention effects. While the association between social capital within teams and sickness absence remained statistically significant in Model 3, the interaction term was nonsignificant in all of the four analyses.

Finally, results showed that the size of work groups was positively and significantly associated with risk of sickness absence across the analyses, while age and gender composition in work groups was not significantly associated with risk of sickness absence at the group level.

#### 4. Discussion

The aim of the present study was to investigate whether social capital in the workplace measured at the level of work groups was associated with the level of sickness absence in 41 work groups and to investigate the possible effects of an intervention on social capital in the workplace on sickness absence.

The results showed that the group level of social capital within work groups, social capital in relation to the immediate manager, and social capital toward the workplace as a whole was negatively associated with the sickness absence percentage in work groups, and these associations were statistically significant. For social capital between work groups, we found no statistically significant association. The results also showed no significant differences in associations between the work groups that participated in the intervention activities and the work groups that did not, as the interaction term presented in Model 3 was statistically nonsignificant for all subtypes of social capital.

The present study adds to the literature on the association between social capital in the workplace and risk of sickness absence as only few previous studies have investigated the association between social capital measured at the level of work groups and risk of sickness absence [18–20]. A study from Török et al [18] is in agreement with the present study in finding that higher levels of social capital in the workplace are associated with a lower risk of sickness absence. There are, however, also important differences between the two. First, whereas the present study analyzes sickness absence strictly at the level of work groups, the study from Török et al [18] investigates individual-level risk of long-term sickness absence. Second, the study from Török et al [18] is based

on responses from more than 30,000 employees in the Danish health-care services working in 2,182 work units, while the present study is based on observations from 41 work groups in the Danish dairy industry. Third, the study from Török et al [18] deploys a global measure of social capital, while the present study uses a four-dimensional measure of social capital. Despite these differences, the two studies are in agreement in finding that social capital constitutes an important resource in the psychosocial work environment in different branches of the labor market, which supports the robustness of the results of the two studies.

Contrary to the study from Hansen et al [22] that did not find an association between social capital measured at the workplace level and sickness absence, the present study provides evidence in support of the hypothesis of the association between social capital in the workplace and prevalence of sickness absence. One reason for the differing results of these two studies may be that the present study analyzed social capital at the level of work groups, whereas the study from Hansen et al [22] analyzed social capital at the workplace level. As argued in the Introduction, social capital may be most appropriately measured at the level of work groups [8,25] as social capital can be considered a shared property of work groups sharing a common identity rather than a property of more distal, “higher order” social relations in larger social communities, such as entire workplaces [24].

The findings from the present study imply that social capital may indeed be a multidimensional concept, in which the individual dimensions may be of differing importance in predicting important outcomes, such as sickness absence. As stated in the Introduction, we expected that social capital within work groups and social capital in relation to the immediate manager would be a more important determinant for risk of sickness absence than social capital between work groups. These expectations were supported by the findings and follow the lines of reasoning in social identity theory [24] that state that proximal social relations are more important determinants for individual identities than more distal social relations. As social capital offers opportunities for participation, social support, and reciprocity, it is reasonable to expect that well-functioning proximal social relation may be more strongly related to well-being and risk of sickness absence than more distal relations.

In the present study, we also investigated the possible effects of a workplace intervention on social capital on sickness absence. The results showed, however, that although we found statistically

significant associations between subtypes of social capital and sickness absence, we found no statistically significant differences in the associations when comparing the work groups that participated in the intervention and the work groups that did not, which implies no significant differences between the intervention group and the control group.

Finally, according to the job demands–resources model [34,35], job resources are aspects of the work environment that support the employee in solving his or her work tasks and enhance the well-being of the employee. By focusing on cooperative relations in the workplace, the concept of social capital may be considered a job resource, as well-functioning cooperative relations on the one side may contribute to enhancing the efficiency in the production processes, while simultaneously fostering work-related well-being, as for instance work engagement and job satisfaction [8,36]. The findings of the present study are therefore in line with findings from previous studies that report association between resources in the psychosocial work environment and risk of sickness absence in particular [3] and work-related well-being in general [37,38].

#### 4.1. Strengths and limitations

A clear strength of the study is that the analyses were based on survey data that were linked to register-based information on sickness absence from the participating workplaces. This implies that we precluded potential limitations pertaining to loss to follow-up and recall bias in the estimation of risk of sickness absence. Moreover, information on independent and dependent variables stemmed from different data sources, which limit potential biases from common methods variance [39].

One major limitation of the study may be ascribed to the fact that we are unable to distinguish between short-term and long-term sickness absence. This makes the observed sickness absence percentages in the individual work groups vulnerable to bias from cases of long-term sickness absence. We therefore decided to compute the outcome variable as the average sickness absence percentage from the full two-year follow-up period. This allowed us, to the highest possible extent, to limit the potential biases from cases of long-term sickness absence on the sickness absence percentage in individual work groups.

Another limitation may be that the analyses are based on very few observations – between 36 and 41 observations – which may limit the statistical power of the analyses. Despite this limitation, we were able to find statistically significant associations between the sickness absence percentage at the level of work groups and three of the four subtypes of social capital in Model 1.

It may also be considered a limitation that staff turnover may have affected the observed associations. It was not possible to take this potential limitation into account in the present analyses. In a previous study on the same study population [12], however, we found that staff turnover only had a marginal impact on the observed associations between social capital and psychological well-being.

It could also be argued that the low intraclass correlations ( $ICC(2) < 0.7$ ) observed for two subtypes of social capital may indicate low levels of within-group agreement. This may either be ascribed to the fact that the measured constructs do not constitute genuine group-level phenomena or that group members do not agree about the levels of social capital in the group (which in itself is a group-level phenomenon). No matter which of the two interpretations of the low  $ICC(2)$ -correlations are considered most plausible, we argue that the deployed measures of social capital, by definition, constitute group-level phenomena, as we (1) investigate phenomena that, theoretically, are constituted at the group level

and (2) apply the methods of reference shift consensus [29] in the measurement of social capital in the present study.

A final limitation may be that we were unable to adjust for potential confounders such as health behaviors of the respondents as has been carried out in other studies [19,21]. According to these two studies, however, the association between social capital and sickness absence is not affected when adjusted for health behaviors. Moreover, in the present analyses, we adjusted for age and gender and on that note, we were able to take some potential confounders into account in the analyses. Finally, it can be argued that other, unmeasured potential confounders at the workplace level also could have an impact on the association. In the analysis, we did, however, adjust for random effects at the workplace level, which, to some extent, allows us to take such unmeasured, potential confounding into account in the analysis.

## 5. Conclusions

The results of this study show that the work group level of social capital is associated with the work group level of sickness absence. The findings of this study are in accordance with findings from previous studies but also add to the knowledge on the association between social capital and sickness absence by providing evidence on the association in a population of industrial workers, thereby underlining the relevance of the concept of social capital for public health. The results also indicated that the intervention to enhance group-level social capital had no effect on reducing sickness absence in the intervention group. The results from this and other study show that high levels of social capital are associated with a series of positive work-related outcomes, which implies that efforts to enhance social capital in the workplace may enhance worker well-being.

## Conflicts of interest

The authors declare that there are no conflicts of interest.

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## Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.shaw.2020.04.001>.

## Appendix 1. Items in the social capital questionnaire

### *Social capital within teams*

1. In my team, we help colleagues who have too much to do
2. In my team, we agree on what is most important in our work tasks
3. I have trust in the ability of my team to do a good job
4. There is a sense of community and cohesion in my team
5. I feel like an equal member of my team
6. In my team, we are good at giving each other ideas on how to improve the way we do our work tasks

### *Social capital between teams\**

1. My team cooperates well with other teams
2. My team and other teams recognize each other's contribution towards solving the work tasks
3. We agree on the most important targets in our work across the teams in the workplace
4. Other teams give us the information we need to do our job well
5. Other teams have a clear understanding of the work, that we do in my team
6. We trust the ability of the other teams to do their job well

#### *Social capital in relation to immediate manager*

1. Our immediate manager takes our needs and views into consideration when making decisions
2. The teams' relationship to our immediate manager is characterized by mutual respect and recognition
3. Our immediate manager contributes to solving everyday problems
4. The cooperation between my team and our immediate manager is balanced regarding contributing and receiving
5. Our immediate manager has a clear understanding of the work, that we do in my team
6. Our immediate manager is good at giving me and my colleagues ideas to how we can get better at solving the work tasks

#### *Social capital towards the workplace as a whole*

1. The employees are involved in decisions about changes in the workplace
2. There is a shared understanding between the management and the employees about how we go about our work tasks
3. In my team we feel a strong commitment to our workplace

Response options: 1) To a very low extent, 2) To a low extent, 3) Somewhat, 4) To a high extent, 5) To a very high extent

\* In the assessment of social capital between teams, we asked respondents to evaluate the social capital towards each work group with which the respondents' work group cooperated.

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