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Collaboration and perceived job demands, job control and social support in primary care: a social network approach

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Abstract

Purpose – This study aims to examine the associations of collaboration measured as social network characteristics with perceived job demands, job control and social support in primary healthcare professionals.
Design/methodology/approach – A cross-sectional study design incorporating social network analysis was utilized. Wellbeing surveys with a network questionnaire were sent to care personnel (physicians, nurses and allied health workers) of Finnish primary healthcare in December 2022 ($n = 96$). Correlation coefficients and multivariate linear regression modeling were used to analyze the associations.
Findings – Higher level of collaboration (measured as number of connections in the network) was associated with lower perceived job demands and higher job control. Care professionals' frequency of collaboration and proportion of connections with the same occupation (homophily) were borderline associated with social support, indicating further research needs. Larger professional networks, perhaps enabling better teamwork and sharing of workload or information, may directly or indirectly protect from job strain.
Practical implications – Work-related collaboration in primary care should be encouraged and large support networks need to be promoted further. Individuals, especially allied health workers, working in multiple

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locations or as a sole member of their occupation group in the work community need to be provided with adequate social support.

Originality/value – Social network analysis has been proposed as a tool to investigate care integration and collaboration, but direct analyses of network measures and validated wellbeing instruments have remained absent. This study illuminated the role of collaboration structures in work-related wellbeing of care professionals by showcasing the potential of social network analysis.

Keywords Collaboration, Job demands, Social network analysis, Work organization, Integrated care

Paper type Research paper

Background

Healthcare systems across the globe are suffering from a shortage of health and care workforce, with projections estimating a deficiency of 10 million professionals by 2030 (Boniol *et al.*, 2022). The World Health Organization has enacted a global strategy for human resources for health, which includes multiple objectives and policy options related to optimizing the use of the workforce (World Health Organization, 2016). The importance of measures such as integrated people-centered health services and addressing the inflow and outflow of health workers are underlined. In addition, to help recruit and retain care workers, increasing the work-related wellbeing of care professionals by reducing strain and burn-out is paramount (Maeda and Socha-Dietrich, 2021).

Integrated care, a challenging concept to define, can be seen as joining together the fragmented designs and parts of systems with the aim of delivering comprehensive and people-centered care (Goodwin, 2016). It can comprise of multiple functions on different levels, including professional integration, which refers to the collaboration and partnerships between different care professionals in an organization and between organizations (Valentijn *et al.*, 2013). It is argued to improve patient safety and address issues such as increased demands and expenditures for healthcare services (Rijken *et al.*, 2013; Cameron *et al.*, 2014). In addition, the patient-centered approach of integrated care is suggested to benefit patients with multiple care needs, for whom traditional models of healthcare are often not sufficient (Joseph *et al.*, 2017). However, while integrated care has been shown to have benefits for patients, the impact on healthcare professionals is less clear. Systematic reviews have found mixed effects of integrated care on job satisfaction, work autonomy, stress or workload, and staff work experience (Baxter *et al.*, 2018; Liu *et al.*, 2023). Understanding the impact of integrated care on healthcare professionals is vital due to the vulnerability of the healthcare workforce, particularly after COVID-19, and the Organisation for Economic Co-operation and Development's (OECD) calls to invest in retention and recruitment through measures such as improved working conditions (Morgan and James, 2022; OECD and European Union, 2022).

One of the main challenges in evaluating the impact of integrated care on employees is the difficulty of measuring collaboration among health care professionals (Tikkanen *et al.*, 2023). One potential solution is to utilize social network approach (SNA), as proposed by Burns and colleagues (2022), where the focus is on the network architecture, connections between individuals and the role of these connections in transmitting information, resources and support. SNA enables the calculation of different network metrics, such as the density of connections, strength of ties, or centrality of actors. Rather than focusing on the structural approach, which has been frequently studied, SNA utilizes the processual approach, of which communication (and thus collaboration) is a central component (Burns *et al.*, 2022). This is consistent with other studies which have identified communication as a vital factor in integrated care (Mackie and Darvill, 2016; Jolanki *et al.*, 2017). By recognizing that integration is fundamentally a social process, SNA provides the measures to characterize the social structures and relationships that facilitate the essential processes of communication and cooperation within integrated care (Gittell and Ali, 2022; Kerrissey, 2022).

We examined collaboration by SNA measures capturing actor centrality, strength and homophily. A central actor (in this case a professional) has many collaborative ties with others which reflects the "popularity" of the individual, i.e. access to many resources such as information (Burns *et al*., 2022). Furthermore, tie strength (how often two professionals collaborate) can be seen as an important indicator of relationship longevity and proximity, which are especially useful when implementing change or reforms (Burns *et al*., 2022). Homophily refers to the sociological principle of individuals interacting more often with people similar to them (McPherson *et al*., 2001). For example, in the healthcare setting individuals within the same profession tend to work in homophilous groups (for example nurses with other nurses), which may pose a barrier to integrated care (Meltzer *et al*., 2010; Shoham *et al*., 2016).

As discussed by Valentijn and colleagues (2013), further professional integration can help increase shared accountability and decision-making and promote efficient problem solving. In addition, it can potentially reduce the hierarchies and the rigid roles between care professionals, which are still prevalent in healthcare (Valentijn *et al*., 2013). These factors, or their lack thereof, might affect the psychosocial wellbeing of care professionals. Given the significance of collaboration to integrated care and the need to evaluate its impact on the wellbeing of healthcare professionals, our aim was to illuminate the potential association between collaboration in the workplace, as measured by social network analysis, and the psychosocial work characteristics as defined by the job demand–control–support (JDC) model (Karasek *et al*., 1998). It is reasonable to assume that cohesive and high-quality collaboration among professionals can enhance the perception of decision authority and skill discretions (job control), lower the job demands and improve the sense of social support. It is also possible that a good psychosocial work environment enhances collaboration and thus professional integration. Our approach addresses the research need identified by Gittell and Ali (2022) of understanding the impact of networks (and collaboration) on external outcomes such as the wellbeing of professionals. JDC is the most established and widely studied model used to evaluate the critical aspects of work influencing employee wellbeing outcomes, such as cardiovascular disease, turnover and job satisfaction (Häusser *et al*., 2010). In this study, collaboration was viewed through three questions: With how many, how often and with whom, aiming to encompass the different dimensions of collaboration (D'Amour *et al*., 2008).

The following research question was formulated.

RQ1. What is the association between the characteristics of collaboration and perceived job demands, job control and social support among care professionals in Finnish health and social services centers (HSSCs)?

Methods

Design

The study design was cross-sectional with survey data incorporating a social network questionnaire. Social network analysis, which has roots in sociology and graph theory, focuses on the social structures between different actors in a network, such as a workplace (Borgatti *et al*., 2018). In practice, the approach includes identifying the ties between individuals and calculating certain, sometimes relatively simple, metrics either on the level of the individual or on the entire network. These metrics can illustrate for example the overall connectedness in a network, or as in the present study, the connections an individual has. The approach can help analyze and optimize interactions, locate bottlenecks and key actors, and understand collaboration between actors in network.

Study setting

The study was conducted in a Finnish region with approximately 200,000 population and one larger city (with the central hospital) and nine other smaller municipalities. The surveys were

distributed before the large national social and healthcare reform, which came into effect in January 2023. The reform organized all health and social care under new wellbeing services counties. Prior to the reform, the services in the region were provided by a joint authority, which included seven of the municipalities in the region.

Primary health and social care are provided by HSSCs. The teams working in these centers typically consist of a physician, a psychiatric and substance abuse nurse, and a registered nurse. In addition, psychiatrists, social work professionals, nutritionists and in some cases psychiatric nurses worked in the same teams or within their own teams. These professionals often also provided services for several teams.

Data collection

The data were collected using online surveys in December 2022. The participants were sent a personalized link to an electronic questionnaire through email, in addition to an information letter. Opening and answering the questionnaire was regarded as informed consent to participate in the study.

The survey was distributed to all health-care professionals working with clients in the eight HSSCs. Contact persons (managers) from each center provided a list with contact details of all care professionals working in the center at the time. Team leaders received the questionnaire if they worked partly with clients and not only as managers. The survey included two parts, a social network questionnaire regarding collaboration following with questions on the perceived work-related wellbeing of the participants.

For the social network part, each survey was tailored to the specific HSSC. We used the so-called roster approach (Agneessens and Labianca, 2022), where the participants were provided with list of names of all the professionals working in their HSSC. This type of closed questionnaire is often recommended, as it is less demanding for the respondents because they do not have to recall all their contacts from memory (Borgatti *et al.*, 2018).

Participants were asked to choose each person they had collaborated with during the last six months regarding the management of patients who have multiple service needs and issues related with mental health or substance abuse. Collaboration was defined as both official and unofficial contact, in person, or otherwise. Communication was ranked on a non-linear scale of one to five and was to be left blank in case of no collaboration.

Study variables

Dependent variables of interest were perceived job demands, job control and social support, which were retrieved from the survey questionnaire. The survey utilized validated work psychology scales, more specifically previously translated versions that have been used in the Finnish context (Haybatollahi, 2009).

Job demands were measured through a sum variable of two items from Karasek's job content questionnaire (Karasek *et al.*, 1998), asked through *"How often has the following disturbed, worried, or strained you at work in the past six months?"*: *"My job requires very hard work"* and *"My job requires excessive work"* (Spearman-Brown statistic: 0.83). The responses were rated from 1 *"Very rarely or never"* to 5 *"Very often or constantly"*.

Job control was measured using a sum variable of three statements from Karasek's job content questionnaire (Karasek *et al.*, 1998), asked by *"To what extent does each of the following statements reflect your current perception of your job? Think about the past 6 months"* The items were *"My job allows me to make a lot of decisions on my own"*, *"I have a lot to say about what happens on my job"* and *"On my job, I have very little freedom to decide how I do my work"* (Cronbach alpha: 0.82). The responses were rated from 1 *"Fully disagree"* to 5 *"Fully agree"*. The third item was reversed.

Social support was measured using a sum variable of four questions, adapted from Jetten and colleagues (2012): *"I receive emotional support from my colleagues"*, *"I receive the help I need from my colleagues"*, *"I receive the resources I need from my colleagues"*, and *"I receive*

the advice I need from my colleagues" (Cronbach alpha: 0.88). The responses were rated from 1 *"Not at all"* to 7 *"Very much"*.

The network measures were calculated on an individual (node) level where centrality, i.e. individual density, strength and homophily were used to characterize collaboration within the integrated care setting.

First, the level of collaboration was measured using the network measure of individual density, which equals the number of incoming connections (indegree) the person had from other professionals out of all possible incoming connections (number of all names listed in the HSSC, minus themselves). This was then scaled with linear transformation to 1–5, with larger values indicating more connections.

Second, the frequency of collaboration was measured using the network measure of strength which corresponds to the average value of all incoming connections. The variable was rated on a scale of 1–5 with the following options: rarely, monthly, weekly, daily and more than once a day. Higher values indicate on average that the respondent was chosen more frequently as a collaborator by their colleagues.

Third, the level of working with members of the same occupation was measured using the network measure of homophily. This refers to the proportion of collaboration connections chosen by the respondents (outdegree), which were made to the same occupation group as the participant. For example, a value of 50% means that half of the connections of the participant were with colleagues from the same occupation.

Lastly, demographic variables were age, sex and occupation group, which were categorized as nurse (including registered nurses, advanced practice nurses, public health nurses, and psychiatric and/or substance abuse nurses), physician (including physicians, general practitioners and chief physicians), and other (allied health and social work professionals including social workers, social counsellors, physiotherapists and a nutritional therapist). These were used as adjusting variables, as both sex and occupation have been found to moderate and affect the perception of psychosocial factors (Fila *et al.*, 2017), and workers of different ages appear to experience workload and control in distinct ways (Besen *et al.*, 2015). In addition, adjusting for the demographic variables helps take into account the work-related, socioeconomic and life-span factors, which might affect collaboration in the workplace or the level of perceived job demands, job control and social support.

Statistical analyses

The univariate associations between the dependent and independent variables were analyzed using Spearman correlation coefficients and their associated *p*-values, as the variables were not normally distributed. Missingness was handled using list-wise deletion for the outcome variables ($n = 2$) and pair-wise deletion for the other variables ($n = 3$), resulting in 93 complete responses for the multivariate linear regression. To analyze the multivariate associations, three separate linear regression models were built, with perceived job demands, job control and social support as the dependent variables, and the network variables as the independent variables. The dependent variables were square root transformed, as their distributions were negatively skewed. The models were adjusted for age, sex and occupation group. The assumptions of linear regression were checked for and met. Statistical significance was defined as $p < 0.05$.

Ethical considerations

The study was approved by the Finnish Institute for Health and Welfare Ethics Board (THL/5787/6.02.01/2021/§889). Permits to conduct the study were applied for and received from the participating organizations. This study was performed according to the principles of the Declaration of Helsinki.

Results

In total, 98 participants responded to the questionnaire, but two were removed due to missing data in the outcome variables. The response rate was 28.1%, being the lowest for physicians (20.5%), 26% for nurses, and highest for allied health and social workers (50%). Characteristics of the participants can be seen in Table 1. The participants were on average 45 years old, and majority were female (87%). The most common occupation group was nurses (60%), followed by allied health and social workers (24%) and physicians (16%).

The participants reported their perceived job demands as relatively high (3.6). Similarly, the level of perceived job control was considerable, averaging 3.5. Social support was measured on a scale of 1–7 and was perceived on average as satisfactory (5.7). On a scale of 1–5, both the level of collaboration and the frequency of collaboration were moderate among the participants (mean: 2.5 and 2.3, respectively). The average proportion of connections with the same occupation was nearly 50%, with significant variation between different occupational groups, ranging from 23% for physicians to 60% for nurses.

Univariate associations between the network variables and the dependent variables were examined (Table 2). Higher level of collaboration (number of incoming connections) was statistically significantly correlated with lower perceived job demands and higher job control (correlation coefficients of -0.22 and 0.43, respectively). The results also point to a potential weak negative correlation between proportion of connections with the same occupation and lower job control (correlation coefficient of -0.18, $p = 0.087$).

The results of the multivariate linear regression are displayed in Table 3. Higher level of collaboration was statistically significantly associated with lower perceived job demands ($\beta = -0.07$) and higher perceived job control ($\beta = 0.13$). For social support, while no statistically significant results were found, the frequency of collaboration and proportion of connections from the same occupation ($\beta = 0.06$ and 0.05, respectively) were near statistical significance ($p = 0.053$ and $p = 0.079$, respectively).

Table 1. Participant characteristics ($n = 94$–96)

	All ($n = 94$–96) Mean/%	SD/*n*	Min – max
Age [a]	45.0	10.1	25–63
Female (%) [a]	87.2%	82	
Occupation (%)			
Physician	15.6%	15	
Nurse	60.4%	58	
Other (allied health and social work)	24.0%	23	
Psychosocial work characteristics (JDCS model)			
Job demands (1–5)	3.63	0.96	1.0–5.0
Job control (1–5)	3.52	1.07	1.0–5.0
Social support (1–7)	5.69	1.13	2.5–7.0
Network measures			
Level of collaboration (1–5)	2.52	1.11	1.0–5.0
Frequency of collaboration (1–5)	2.26	0.91	1.1–4.9
Proportion of connections with the same occupation (%)	49.7%	29.2	0–100
Physicians	23.1%	16.1	0–53.3
Nurses	60.1%	24.4	0–100
Other	40.7%	33.4	0–93.3

Note(s): [a] $n = 94$
Source(s): Authors' own work

Table 2. Spearman's correlation coefficients between the dependent and independent variables ($n = 96$)

$n = 96$	Job demands (1–5)	Job control (1–5)	Social support (1–7)
	Spearman's correlation coefficient (p-value)		
Level of collaboration (1–5)	*−0.22 (0.030)*	*0.43 (<0.001)*	0.13 (0.197)
Frequency of collaboration (1–5)	0.16 (0.117)	−0.14 (0.179)	0.15 (0.144)
Proportion of connections with the same occupation (%)	−0.03 (0.753)	−0.18 (0.087)	0.15 (0.155)

Note(s): Italics = $p < 0.05$
Source(s): Authors' own work

Table 3. Multivariate linear regression analysis, adjusted for age, sex, and occupation ($n = 93$)

$n = 93$	Job demands (1–5)		Job control (1–5)		Social support (1–7)	
	β	95% CI	β	95% CI	β	95% CI
Age	0.02	−0.03–0.07	−0.01	−0.07–0.05	0.00	−0.05–0.05
Sex (ref: Female)						
Male	−0.05	−0.21–0.11	0.10	−0.08–0.29	0.09	−0.05–0.24
Occupation (ref: Physician)						
Nurse	−0.17′	−0.33–0.00	−0.08	−0.27–0.12	−0.13	−0.28–0.03
Other	*−0.26***	*−0.44–0.09*	0.06	−0.15–0.26	−0.04	−0.21–0.12
Network measures						
Level of collaboration (1–5)	*−0.07**	*−0.12–−0.01*	*0.13****	*0.07–0.20*	0.02	−0.03–0.08
Frequency of collaboration (1–5)	0.04	−0.02–0.10	−0.02	−0.09–0.05	0.06′	0.00–0.11
Proportion of connections from the same occupation (%)	0.00	−0.05–0.06	−0.02	−0.09–0.04	0.05′	−0.01–0.10
	$R^2 = 0.118$		$R^2 = 0.186$		$R^2 = 0.073$	

Note(s): The dependent variables were square root transformed, and consequently the standardized beta coefficients correspond to a one root unit change in the dependent variables
‘ = $p < 0.10$, * = $p < 0.05$, ** = $p < 0.01$, *** = $p < 0.001$
β = Standardized beta coefficient
CI = Confidence interval
R^2 = Adjusted coefficient of determination
Source(s): Authors' own work

Discussion

The results of this study demonstrated the associations between higher level of collaboration (more connections) and lower job demands and higher job control. In addition, frequency of collaboration (more frequent connections) and proportion of connections with the same occupation (homophily) were near statistical significance to social support, pointing to potential associations. Successful collaboration among different care professionals is especially important for care integration and multiprofessional work (Mackie and Darvill, 2016), and our findings illuminate the potential psychosocial effects of collaboration and care integration.

Our findings on the level of collaboration highlight the potential effects of larger networks of colleagues. Larger network of contacts, perhaps indicating better teamwork, might be associated with lower acute and chronic fatigue (Cho *et al.*, 2022), in addition to sharing of workload (Yanchus *et al.*, 2017), which can lead to lower perceived job demands. Additionally, the level of collaboration might be correlated with overall perceived functioning of the work community, which is most likely associated with the organization of daily work (Purdy *et al.*, 2010), and thus perceived job demands. Better access to information, support, resources and opportunities by having larger networks has also been associated with lower perceived job strain (Almost and Spence Laschinger, 2002). Integrated primary care services might have larger networks with more collaboration between different care professionals, which draws a potential link between integrated care and lower job demands.

Higher level of collaboration was also associated with higher perceived job control. More extensive networks might point to greater decision-making abilities and more, possibly shared, responsibilities. Seeking advice and furthering the interests of clients independently by utilizing the help of colleagues might lead to perceptions of higher job control and decision-making. In addition, higher level of collaboration has been linked with increased learning and sharing of information (Tasselli, 2015). However, it is also possible that more experienced participants working longer in the organization might have more contacts and simultaneously lower perceived job demands and especially higher job control. Previously, tenure has been linked with increased job satisfaction and lower turnover intention (De Gieter *et al.*, 2011), which could explain a proportion of the finding. These findings may also be explained by Finland's current organizational model emphasizing integrated care, as previous studies have found integrated care to have mixed impacts on the work autonomy, potentially related to the different stages of reform (Liu *et al.*, 2023). However, our results emerging in a multiprofessional care setting known for its relatively developed care integration might indirectly highlight the potential effects of functioning care integration on perceived psychosocial characteristics among care professionals.

One result near statistical significance indicated that higher average frequency contact with colleagues, regardless of the number of connections, might potentially be associated higher perceived social support. More frequent contact with colleagues could enable receiving support from close colleagues and encourage sharing concerns or work-related dilemmas with others. Previous research has linked frequent collaboration among groups in work with better perception of organizational climate, while buffering the effects of work stress (Garrett and McDaniel, 2001). As low social support has been associated with poorer job satisfaction and self-rated health (Lindholm *et al.*, 2003), implementing measures such as peer support work-pairs or groups and encouraging more frequent cooperation with colleagues who share similar expertise is necessary to increase the work-related wellbeing of healthcare professionals. Importantly, better interpersonal relationships have been identified as a contributing factor for collaboration and teamwork (Goh *et al.*, 2020).

The level of homophily, measured through the proportion of connections with same occupation, was borderline associated with perceived social support, but not to job demands or control. Receiving social support might be easier from members of the same occupation group, as others might not have the same background or skills. This result, while statistically insignificant, might indicate potentially lower opportunities for social support among professionals who have limited access to colleagues from the same occupation. Especially allied health workers could have difficulties receiving adequate support if most of their colleagues are registered nurses, or if they work in multiple locations. In a study by Carpenter (2003), social workers in multiprofessional care settings experienced the functioning of teams as worse compared to healthcare professionals, highlighting the importance of supporting and better incorporating different occupational groups into the work environment (Carpenter, 2003). In addition, working in closer proximity to healthcare professionals has been associated with more interprofessional collaboration among allied health workers (Seaton *et al.*, 2021),

further emphasizing the role of physical informal opportunities for communication in collaboration. Co-location and communication have been argued to be linked and critical for collaboration in integrated care settings (Mackie and Darvill, 2016).

Previous research has found a tendency for healthcare professionals to work in homophilous groups (Meltzer *et al.*, 2010; Shoham *et al.*, 2016). Furthermore, existing evidence indicates that healthcare professionals prefer to seek advice from members of the same occupation group (Creswick and Westbrook, 2010; Fronzetti Colladon *et al.*, 2023), which may have benefits, such as higher degree of trust (Barrera and Van De Bunt, 2009). Consequently, it is important to understand why those with lower homophily might have lower social support. This is particularly relevant for nurses, as they have been identified in previous studies to play a mediating role between doctors in an integrated setting (Liberati *et al.*, 2016), which given the power imbalance between doctors and nurses might contribute to the lower perceived social support.

The present study implies that one perhaps overlooked opportunity to increase the wellbeing of care professionals is to affect the collaboration structures in healthcare. Addressing these communication networks might also have a direct impact on job satisfaction (Mundt and Zakletskaia, 2019), and as such, policy makers and primary care leadership should aim to remove organizational barriers which may inhibit collaboration and ensure that enough time and resources are provided to staff to allow for effective communication and cooperation amongst its members (Mackie and Darvill, 2016; Fraser *et al.*, 2018; Stadnick *et al.*, 2019). Previous studies have also identified a need to support stability in team structures, which allows for trust and the development of positive interpersonal relationships (Hovlin *et al.*, 2023). Future studies should strive to explore the effects of the Finnish social and healthcare reform, which might significantly affect the integration of care increasing the collaboration between different professionals. In addition, as the present study focused on primary care, incorporating data from specialized care could provide results on the nature of collaboration between different care levels.

Practical implications of the results highlight the potential role of multiprofessional work in increasing collaboration and work-related wellbeing. For primary care units, work-related collaboration should be included as a metric to examine the psychosocial wellbeing of care professionals. Simultaneously, individuals or professional groups suffering from poor social support or low collaboration should be focused on to increase their wellbeing and help retention. Communication and teamwork could be facilitated through for example the use of collegial peer support groups or pairs. Relevant for continuity of care, the effects of using named personal nurses or doctors on the level of collaboration remain unclear, especially when comparing to varying team models. However, the nature of the collaboration could be affected, with redundant repeating of information potentially being less prevalent.

Strengths and limitations

The study had several distinct strengths and limitations. A major strength of our study is the application of the social network measures to the investigation of integrated care and the work environment. This study utilized the interdisciplinary collaboration approach required (Kerrissey, 2022) to overcome the challenges in applying SNA to the study of integrated care, such as incorporating knowledge and methods from different fields. The research design incorporated both social network analysis measures and more traditional survey-based indicators, strengthening the analysis by minimizing common method bias (Podsakoff *et al.*, 2003). Furthermore, previous research has mostly focused on intradisciplinary connections (Hu *et al.*, 2021), while the present study includes all professions working in the HSSCs. This is in line with the current shift to patient-centered interdisciplinary care (Saint-Pierre *et al.*, 2018).

However, the study is limited by its cross-sectional study design, and therefore causality or direction of the associations cannot be inferred. As the data were collected from a single Finnish region, the results might not necessarily be generalizable to other regions or countries.

However, other regions in Finland, and in other countries, provide nearly identical publicly mandated services, increasing the generalizability of the results. In addition, unmeasured characteristics of the employees, such as tenure and both official and unofficial position in the organization might explain part of the variation in perceived job demands, control and social support. Future studies should strive to take these variables further into account.

Next, the low response rate (22%) and the consequent low number of participants ($n = 96$) reduces the power and the reliability of the analysis. However, this is mitigated by all respondents having both in and outgoing connections, pointing to valid networks with all members being connected to each other. While network studies are particularly sensitive to missing data and a minimum of 75% response rate is recommended, this has been recognized as being very difficult to achieve (Borgatti *et al*., 2006; Agneessens and Labianca, 2022). Additionally, utilizing the survey approach and including a measure of the quality of relationships (strength of ties), rather than only their frequency, allowed us to account for the participants' subjective understanding of their relationships with other professionals (Gittell and Ali, 2022). There exists a possibility of selection bias, as the response rates varied by occupation group with physicians having the lowest response rate. If for example professionals with the highest job demands did not answer the questionnaire, this could potentially affect the results. However, the proportions of the respondents' occupations are in line with the real care settings and the provided name lists, with nurses being the largest professional group taking care of clients with multiple needs.

Lastly, the data were validated by examining reciprocity of the answers, in other words, whether person X and person Y agreed on their level of collaboration. Vast majority (88%) of the possible pairs had identical answers, 8% had deviation of one and only 4% had a deviation of two or more (scale 0–5). The weighted cooperation pairs also showed strong correlation (0.67), indicating adequate accuracy and validity of the data.

Conclusion

By utilizing social network analysis and a wellbeing questionnaire, the present study highlighted the role of collaboration in perceived job demands, job control and social support. Promotion of larger professional networks, for example with peer support collegial groups or work-pairs, might enable better teamwork, information and responsibility sharing, and consequently lower job demands and increase job control among healthcare professionals. The relatively underutilized method of social network analysis can enable analysis of measures related to collaboration and multiprofessional work in different healthcare settings, and further reveal their role in psychosocial wellbeing factors. Future research incorporating network measures and wellbeing of care professionals is needed to confirm the results and further evaluate integrated care and the impact of collaboration on work environment. This can ultimately help analyze and design different work practices, such as personal doctors or team models, which encourage meaningful collaboration that is relevant for the wellbeing of care professionals.

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