Social bonding and the multi-professional service teams: a cross-level test of team social capital influence on knowledge sharing

Social bonding and the multi-professional service teams: a Cross-level Test of Team Social Capital influence on Knowledge Sharing

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Multi-professional service teams might isolate from the organization and inhibit knowledge sharing with others. Professional organizations are thus stimulating their teams to bond more closely with other units, hoping this would facilitate knowledge sharing. Yet, studies on social bonding suggest this could actually deter from knowledge sharing. Our study investigates this further asking: do employees display greater intention to share knowledge when their teams possess greater structural, relational and cognitive social capital? Our cross-level study, grounded on a sample of 226 employees (39 teams in four Hospice & Palliative Care Organizations), shows that individuals embedded in teams with greater social capital are indeed more motivated to share knowledge; and that each form of social bonding – increasing frequency of interactions, trust and mutual support, and similarity of goals/meanings – stimulates different mechanisms of knowledge sharing (attitude, subjective norm and perceived behavioural control)

Keywords: knowledge sharing, team, healthcare, social capital, theory of planned behaviour

Introduction

Knowledge sharing inside organizations and supply chains is fundamental for service quality, innovation and efficiency (Aboelmaged, 2014; Alexander and Childe, 2013; Baihaqi and Sohal, 2013; Tassabehji et al., 2019). Knowledge sharing starts from workers' motivation to share their information about customers, practices, and mistakes. Unfortunately, workers' knowledge sharing is not often spontaneous, and needs to be stimulated (Pawar and Rogers, 2014; Wang and Noe, 2010). Contracts, incentives, and knowledge systems are only partially effective, so organizations also rely on social mechanisms to connect workers with each other (Donohue et al., 2020).

Multi-professional teams have become especially popular in service operations for knowledge sharing, which they are supposed to facilitate in two ways (Henttonen et al., 2014; Piercy et al., 2013). First, they establish a clear framework for knowledge sharing by connecting workers with different professional and disciplinary backgrounds through common tasks. Second, each members is expected to share their personal professional network with their teammates. Accessing new organizational ties, teammates thus acquire more opportunities for knowledge sharing. Yet, multi-professional teams might also isolate its members from the rest of the organization, especially when workers lock their attention into their operation and lose sight of other units (Comeau-Vallée and Langley, 2020; Finn et al., 2010; Liberati et al., 2016).

To avoid knowledge compartmentalization, multi-professional teams are advised to increase the frequency and intensity of their interactions with other units, in order to gain more visibility of others' practices, understand their interests, and build trusting relations. This recommendation is consistent with Coleman's (1990) *social bonding* hypothesis, i.e. closure between social actors increases attention to others' practices and interests, and improve mutual trust; which in turn make knowledge sharing more appealing. The sociology of professions and social network studies however provide two objections. First, the increased visibility originated by social bonding can be perceived as a threat by the workers, if they fear others would intrude in their decisions and reduce their autonomy (Von Nordenflycht, 2010). Workers would thus hoard knowledge to maintain an 'opaque quality' of their work. Second, actors embedded in close relationships might become 'too similar' and suffer from cognitive lock-in (Burt, 2001). Hence they might possess redundant knowledge which is not worth sharing.

Facing such contradictory claims, we ask: *does teams' social bonding stimulate a greater propensity to share knowledge among their members?* If so: *how do different forms of social bonding influence individuals' intention to share?*

To answer these questions, our empirical model presents three building blocks: team social capital, (independent variable), knowledge sharing behaviour (outcome), and Theory of Planned Behaviour constructs (mediators).

Firstly, to capture the notion of social bonding, we adopt Nahapiet and Ghoshal's (1998) construct of social capital at team level. The authors recognized three measures of social capital, which describe three forms of social bonding, i.e. increasing the frequency of interactions (*structural social capital*), the intensity of the interactions (*relational social capital*), and similarity of meanings, values and interests among actors (*cognitive social capital*).

Secondly, we adopted the Theory of Planned Behaviour (TPB, Ajzen, 1991) to conceptualize the proximal antecedents of knowledge sharing behaviour. The TPB links the intention to share knowledge with three beliefs, known as *attitude* (i.e. perceptions that advantages overcome costs), *subjective norm* (i.e. compliance with social influences) and *perceived behavioural control* (i.e. the perception of control over behaviour and consequences). The TPB constructs mediate the link between team social capital and individual knowledge sharing.

Empirically, we investigated the case of multi-professional teams in Hospice & Palliative Care Organizations (H&PCOs). Knowledge sharing is fundamental for H&PCOs, which combine standardized medical procedures with patient-specific service decisions related to family situation, religious beliefs, and mental health. H&PCOs organize their operations through multi-professional teams. Our cross-level study (grounded on a sample of 226 employees in 39 teams in four

H&PCOs) contributes to research on knowledge sharing through a behavioural operations perspective (Bendoly et al., 2010; Donohue et al., 2020; Gino and Pisano, 2008).

Knowledge sharing and Theory of Planned Behaviour

Knowledge sharing is the volitional behavior of sending task-relevant ideas, information, and suggestions to others (Wang and Noe, 2010). Several models explain individuals' intention to perform *any* volitional behavior. Among these, we adopt the Theory of Planned Behavior (TPB; Ajzen, 1991), given the prevalence of its use in the specific case of knowledge sharing (e.g. Armitage and Conner, 2001; Bock et al., 2005; Godin and Kok, 1996; Kuo and Young, 2008; Lin and Lee, 2004; Radaelli et al., 2015; Ryu et al., 2003; Scuotto et al., 2020; Shirahada and Zhang, 2021; Ulker-Demirel and Ciftci, 2020).

Past research linking the TPB with knowledge sharing has systematically followed Ajzen's (1991) original theory. This postulates that, although individuals holds many beliefs about a behavior, only three are salient. First, individuals' intention to perform a behavior is influenced by their *attitude* toward the behavior, e.g. knowledge sharing. This means that individuals' intention to share knowledge is influence by how much they favorably evaluate its advantages over its costs. This is consistent with behavioural operations studies according to which individuals are more likely to share knowledge when they perceive they will receive resources, rewards and reputation in return (Donohue et al., 2020). Individuals might however hoard knowledge to maintain competitive advantage, protect key knowledge from misuse, and avoid opportunistic behaviours (Riege, 2005). Second, individuals' intentions are influenced by their *subjective norm*. This means that individuals are more willing to share knowledge when they want (or think they need to) comply with social pressures from relevant peers to enact this behavior. This is also consistent with behavioural operations studies, which showed that individuals are influenced by

their immediate social environment, and adapt their behaviours to social dynamics (Bendoly et al., 2010; Donohue et al., 2020). Third, individuals' intention to share knowlede are influenced by their *perceived behavioral control* (PBC), i.e. the perceived ease of engaging in the behavior and controlling its consequences. Operational studies similarly found that individuals are moved by considerations of trust and trustworthiness when they engage with risky behaviours (Ozer et al., 2011,2014). Donohue et al. (2020) noted that we 'put ourselves in a vulnerable position by trusting [in] anticipation that our trusted partner, another homo sapiens, will be trustworthy' (p. 193). Knowledge sharing is a particularly risky behaviour, because it exposes the individual to others' opportunism, such as misusing or misunderstanding the shared knowledge, or appropriating key information for competitive reasons (Evans et al., 2015). As such, individuals are willing to share knowledge when they are confident they are protected from negative consequences. PBC is also expected to be a proxy for actual control over the behavior. In other words, knowledge sharing might be a difficult behavior to enact – thus, if the individual cannot control (or does not perceive to control) its application, they are unlikely to engage with knowledge sharing at all (Radaelli et al., 2015; Riege, 2005). Adopting the Theory of Planned Behavior framework for knowledge sharing, we thus hypothesise:

H1A. Higher attitude is related to higher intention to share knowledge

H1B. Higher subjective norm is related to higher intention to share knowledge

H1C. Higher PBC is related to higher intention to share knowledge

H1D. Higher intention to share knowledge is related to team members' knowledge sharing

H1E. Higher PBC is related to higher knowledge sharing

A team social capital perspective on knowledge sharing

To measure the role of social bonding on knowledge sharing, we adopt the concept of *social capital*. Social capital represents the 'social relationships among persons which promote or assist the acquisition of skills and traits valued in the marketplace' (Loury, 1992, p. 100). Nahapiet and Ghoshal (1998) noted that: 'the central proposition of social capital theory is that networks of relationships constitute a valuable resource for the conduct of social affairs' (p. 243). So, actors are incentivized to bond 'more' and 'better' with others to access their knowledge and assets. Nahapiet and Ghoshal (1998) identified three ways for social actors to bond. They could rely on frequent interactions (i.e. build *structural* social capital); increase the intensity/commitment of relationships (i.e. build *relational* social capital); adjust to the cognitive schemata, goals and aspirations of others (i.e. build *cognitive* social capital). Henceforth, we develop hypotheses related to how each dimension of social capital relates to attitude, subjective norm and PBC.

Team Structural Social Capital

Team *structural* social capital refers to the 'quantity' of connections teams have with other actors, expressed in terms of the number and frequency of interactions (Coleman, 1990; Hu and Randel, 2014; Nahapiet and Ghoshal, 1998). This property indicates that a team is 'central' in an organizational network, so team members have more occasions to deliver their knowledge, but also more occasions to be observed by others.

Direct and frequent interactions shared by teammates increase individuals' capacity to see other people's behaviours (and thus understand their social expectations), and their awareness of being observed by other people. As direct and frequent interactions with others increase the chances of adopting innovations (Phelps et al., 2012), we hypothesize that they also stimulate the emulation of pro-social behaviours. External visibility increases the chances of strong sanctions against opportunistic behaviours, e.g., hoarding knowledge; and conveys norms of reciprocity

(Gargiulo and Benassi, 2000; Moran, 2005). Individuals are then more likely to perceive higher transactional and psychological obligations toward the organization and less likely to act on a hidden profile. Burt (2001) noted that higher visibility 'increases the salience of reputation for entry to future relations' with mutual acquaintances (p. 38). We suggest that teams' access to a large network of ties increases the visibility of employees' actions in the organization, which generates higher concerns for normative sanctions against knowledge hoarding and higher appreciation for the normative and reputational incentives toward knowledge sharing.

H2A. Higher team structural social capital is related to team members' higher subjective norm towards knowledge sharing

Embeddedness in a broad network of ties means participating in a context where knowledge sharing is both encouraged socially and supported practically (Gargiulo and Benassi, 2000; Nahapiet and Ghoshal, 1998). The 'exchange-inducing social norms and supporting sanctions' (Coleman, 1990, p. 116) that stimulate individuals to comply with social pressure are also likely to build positive climates/cultures towards knowledge sharing (e.g., increased tolerance toward failures and promoting a more free flow of information) and against opportunistic behaviours (Moran, 2005; Riege, 2005). More social ties also represent more opportunities to find relevant and interested recipients of shared knowledge. It might be easier to share knowledge when connected to a broad rather than restricted network of acquaintances (Nahapiet and Ghoshal, 1998; Reagans and McEvily, 2003). Teams which provide their members with more direct and frequent ties might thus make knowledge sharing easier and less risky.

H2B. Higher team structural social capital is related to team members' higher PBC towards knowledge sharing

Finally, while our empirical model will test the relationship between team structural capital and attitude, we do not expect these to be correlated. Exposure to a larger amount of ties might be interpreted by individuals as an opportunity to have a bigger impact in the organization and receive reciprocal gains; but also as a threat that more individuals could identify and exploit their unique knowledge assets (Cabrera and Cabrera, 2002). This suggests that greater structural embeddedness does not necessarily change the intrinsic assessment of the behaviour, which is guided by pre-existing beliefs and personal interests (Wang and Noe, 2010).

Team Relational Social Capital

Team relational social capital refers to the intensity of connections that teams have with other actors, expressed in terms of affection, mutual trust, and willingness to spend time together (Hu and Randel, 2014; Makela and Brewster, 2009). Low relational social capital represents relationships led by personal interest, where the parties lack mutual trust or do not abide by norms of reciprocity. Past research provides extensive evidence that trust and trustworthiness enable knowledge exchange because individuals feel in greater control of the consequences of the behaviour; e.g. they trust the recipients not to misuse the knowledge nor engage with opportunistic behaviours (Ozer et al., 2011,2014). Relational closeness is crucial to transfer expert and tacit knowledge, which is 'sticky' (Szulanski, 1996) and a may get partially lost in the transfer (Hansen, 1999; Levin and Cross, 2004). The relational closeness engendered by interpersonal trust and identification prompts individuals to put efforts in sustaining the relationship over time and dedicate more time to explain the content and meaning of knowledge (Hansen, 1999; Moran, 2005). We then expect individuals embedded in teams with higher relational closeness to the 'outside world' to be more confident about their ability to communicate knowledge appropriately.

H3A. Higher team relational social capital is related to team members' higher PBC towards knowledge sharing

Relational closeness also increases the visibility of actions in the organizational network; and encourages the emergence of a strong norm of reciprocity. This would boost motivation to comply with socially accepted behaviours and discourage deviation from the norm. Relational closeness facilitates mutual observation between team members and external actors. While team structural social capital increases the visibility of more behaviours to more people, team relational social capital increases the visibility of behaviours for more time and with greater insights (Ferris et al., 2003). This increases individuals' capacity to see other people's behaviours and increases their awareness that other people are observing them (Coleman, 1990; Phelps et al., 2012). We thus hypothesize that close ties stimulate the emulation of proactive and pro-social behaviours, to gain social approval and avoid sanctions. Relational closeness also implies an interpersonal goodwill trust which opportunistic or deviant behaviours would jeopardize (Hite, 2005; Jha and Welch, 2010). Deviant behaviours can be easily spotted and penalized because relational closeness allows 'in-depth' observations of each other's action. We then expect that individuals extend their feelings of obligation and compliance to affective ties shared by teammates.

H3B. Higher team relational social capital is related to team members' higher subjective norm towards knowledge sharing

We do not expect team relational social capital to relate to members' attitude toward knowledge sharing. The exposure to affective ties might be interpreted as an opportunity to have a deeper impact and receive more reciprocal gains from the dyadic relationship; but also as a threat that the other parties could have in-depth access to precious knowledge assets (Von Nordenflycht, 2010). This suggests that greater affective embeddedness might not change the intrinsic assessment

of the behaviour, since the latter is connected to pre-existing beliefs and personal interests (Wang and Noe, 2010).

Team Cognitive Social Capital

Cognitive social capital represents the presence of shared meanings, goals and values supporting a shared understanding among actors of what should be accomplished (Nahapiet and Ghoshal, 1998). Team cognitive social capital is high when teams develop a shared cognitive framework with others in the organization; it is low when the involved parties pursue different goals and aspirations. Cognitive frameworks shape 'individual interests and desires, framing the possibilities for action' (Powell and Colyvas, 2008, p. 277) and their attitudes toward a given behaviour (Cohen and Bailey, 1997). Shared cognitions shape positively the attitude toward knowledge sharing. Inkpen and Tsang (2005) argued that firms are more willing to share knowledge with other actors in their supply chain when they perceive convergent interaction logics, and congruent goals. We suggest that these insights translate at a team level of analysis, i.e. team members are more likely to perceive advantages when recipients have congruent goals and aspirations. In relationships characterized by divergent goals and visions, individuals might consider collaborations suspiciously (Wang and Noe, 2010).

H4A. Higher team cognitive social capital is related to team members' higher attitude towards knowledge sharing

Shared cognitive frameworks also represent bonding mechanisms that make knowledge sharing and assimilation easier and less risky (Inkpen and Tsang, 2005, Nonaka, 1994). When employees share representations and narratives of reality, they 'can more easily discuss problems, transfer ideas, share knowledge, and offer more effective assistance to one another' (Bolino et al., 2002; p. 511). Individuals might feel more reassured that recipients with common cognitive frameworks

understand and use their shared knowledge properly. Individuals might instead be concerned that recipients with divergent goals and values might reject or misinterpret the shared information (Szulanski, 1996). Knowledge sharing is also more difficult when individuals must establish a missing cognitive frame. Individuals embedded are thus more likely to perceive knowledge sharing as easier and less risky in teams characterized by convergent logics.

H4B. Higher team cognitive social capital is related to team members' higher PBC towards knowledge sharing

Finally, we do not expect team cognitive social capital to be related to members' subjective norm. The existence of a common cognitive framework does not convey more or more influential social pressures toward the individual. Cognitive lock-in do not represent mechanisms of compliance with a social pressure; but mechanisms of conformity where they internalize shared behaviours and interpretations in their attitude.

Method

We identified H&PCOs as exemplary contexts for our study. Healthcare organizations have long been privileged settings for teamwork and knowledge studies, since the sharing/integration of expert information from diverse professionals is crucial for service quality (Finn et al., 2010; Mura et al., 2013; Ryu et al., 2003). H&PCOs are convenient for two main reasons.

First, knowledge sharing is crucial for the service quality and efficiency of H&PCOs, but cannot be fully standardized or automatized (Ellershaw and Wilkinson, 2011). H&PCOs treat terminally ill patients, providing them with a peaceful journey to death (Meyer et al., 1997). Such journey is highly patient-specific, depending on medical conditions, service preferences, family and caregiving arrangements, economic situation, and religious beliefs. Professionals share complex bundles of knowledge where standardized clinical/therapeutic decisions intertwine with

information about patients' psychological and socio-demographic characteristics (Faulkner, 1998). The shared knowledge is mostly *tacit* since it cannot be fully pinned down in pathways and guidelines; *complex* because it integrates clinical, technical and psychological elements; *case-specific* because different patients require different communication and clinical strategies; *personalized* because professionals are peculiarly influenced by training discipline, professional role and past experiences. Knowledge sharing is complicated and time-consuming since workers need to enfold codified clinical information inside tacit and experiential knowledge.

Second, the H&PCOs in our sample are ideal to assess our *social bonding* hypothesis. Our H&PCOs organize their expert workers into multi-professional teams, which include physicians, nurses, physiotherapists and other professional figures. Each team member provides non-redundant ties to others. H&PCOs present high rates of internal cohesion, so teammates generally share their social ties with others. Non-participant observations and interviews with staff and management revealed that each worker could connect with any other in the organization, the H&PCOs had comparable size; and comparable knowledge systems were in place to make patient-related data available in the organization.

Data and sample

We collected data through a survey questionnaire with three sources of information. H&PCO employees provided information regarding social capital and TPB. We collected control variables from individuals, and double-checked against organizations' internal records. Finally, to collect measures of our outcome variable, we asked team leaders (generally head physicians) to assess how much each team member shared their knowledge (Hirst et al., 2009; Piccolo and Colquitt, 2006). Since appraising team members' knowledge sharing is part of team leaders' job, we expected them to be skilled at doing so.

We collected data in four H&PCOs, widely recognized by peers as high-quality providers. Located in the North-West of Italy, they are comparable in terms of size (number of beds and Full-Time Equivalent employees) and organizational structure. They are not-for-profit organizations and provide home-based and hospice-based care services. The sampling technique used for data collection was a combination of convenience and probability sampling. Convenience (purposive) sampling refers to our selection of the four H&PCOs involved in the study. The four organizationare are widely recognized as high-quality service providers and leaders in innovation processes and knowledge sharing capabilities, and therefore represented ideal settings for the purpose of our study. Whithin each H&PCO, we adopted instead a probability sampling for the selection of respondents. Specificall, we adopted a simple random sampling approch as we sent our survey to all professionals of the four organizations involved in the study and every member had an equal chance of answering the questionnaire. In each H&PCO, we found multi-professional teams in place for at least one year and which met at least twice a week to review performances, set targets, and discuss patient cases. The four H&PCOs comprised 274 professionals displaying these characteristics. We administered the survey to all of them. 229 questionnaires were returned, 3 of which were unusable and thus discarded, resulting in an 82% response rate, which is very high. The sample is representative of 39 teams, with an average 5.58 professionals per team (s.d. = 1.55) which usually included one physician (team leader), one/two nurses, two healthcare assistants and, sometimes, one psychologist and/or physiotherapist. Table 1 provides descriptive statistics for the respondents of the final sample and also shows that the sample used in our study is representative of our population. Additionally, results of an ANOVA analysis do not show any significant difference in the constructs of interest among the four organizations (the largest difference in means was 9% for relational social capital between organizations 1 and 4, $p > .05$).

Table 1. Sample characteristics[1]

Organisation	No. beds	Population	N	Teams[2]	Physicians	Nurses	Psychologists	Physiotherapists	Assistants
1	28	72	61 (85)	11	18 (94)	21 (95)	4 (80)	3 (75)	12 (92)
2	18	85	80 (94)	13	15 (94)	28 (100)	2 (67)	2 (67)	27 (96)
3	18	69	54 (78)	8	12 (92)	20 (100)	6 (100)	2 (67)	14 (93)
4	20	48	31 (65)	7	7 (70)	11 (73)	2 (67)	1 (50)	10 (56)
Total		274	226 (82)	39	45 (93)	69 (98)	12 (82)	7 (70)	53 (94)

Note: [1] The response rate is given in parentheses (%). N is the number of responses usable for analyses. 14 employees did not declare their professional category. [2] Number of teams represented by the sample.

Measures

Following Ajzen (1991), we first conducted face-to-face interviews with personnel from one H&PCO to elicit the behavioural, normative and control beliefs of the respondents. This enhanced our understanding of the context under investigation and refined the wording of our questions. Next, we pre-tested the scales on faculty members of two universities, who reviewed the questionnaire and commented on the length and clarity of each item. A final version of the questionnaire was pilot-tested with a group of 48 professionals, representative of the target population. This pilot study dataset calibrated and refined our measures, and was not included in the subsequent empirical analyses. The final questionnaire consisted of 8 scales, for a total of 32 items measured on a 7-point Likert scale anchored from 1 (I totally disagree) to 7 (I totally agree).

We derived every measure from previous research. Following agreements with H&PCO managers, the questionnaire items draw from multiple scales in the literature (Appendix A).

We measured structural social capital with four items adapted from Tsai and Ghoshal (1998) and Subramaniam and Youndt (2005), which assess the frequency of connections with others in the organization. We measured relational social capital with four items from Kale et al. (2000) and Wasko and Faraj (2005), which examine close interpersonal interactions, trust, and friendship with other members. We measured cognitive social capital with four items from Tsai

and Ghoshal (1998) and Ko et al. (2005) which examine congruence in goals and visions with others in the organization.

We measured knowledge sharing behaviour with four items adapted from Davenport and Prusak (1998), Daft (2001) and Wasko and Faraj (2005), which measure how much individuals engage in knowledge sharing in different work-related situations. We measured knowledge sharing intention with four items adapted from Bock et al. (2005) and Hsu et al. (2007), which assess individual's intention to effectively and frequently share knowledge with co-workers. We measured attitude with four items adapted from Bock et al. (2005), Brown and Venkatesh (2005), Pavlou and Fygenson (2006) and Srite and Karahanna (2006), which assess how much individuals believe sharing knowledge will improve practice. We measured subjective norm with four items adapted from Venkatesh and Davis (2000) and Pavlou and Fygenson (2006), which assess how much individuals believe relevant co-workers expect them to share knowledge. We measured PBC with four items adapted from Anderson and West (1998) and Bock et al. (2005), which assess individuals' perception that the workload and climate within H&PCOs allow for knowledge sharing. The PBC construct can involve a context-specific measure. During preliminary discussions, key H&PCO informants argued that control for them meant: (i) knowledge sharing would not require so much time/effort to affect the existing workload and (ii) the existing climate between the team and other organizational units would 'protect' individuals from inappropriate reactions. The concepts of workload and climate were then included as proxies of PBC. Reliability coefficients, ICCs, and correlations among variables are presented in Table 2.

Table 2. Correlations among study variables, reliability and ICC coefficients[a]

Variables	1	2	3	4	5	6	7	8
Within-group level[§] (n = 226)								
1. Structural Social Capital	.---							
2. Relational Social Capital	---	---						

3. Cognitive Social Capital	---	---	---					
4. Knowledge Sharing	---	---	---	(.714)				
5. Intention	---	---	---	.570***	(.798)			
6. Attitude	---	---	---	.359***	.423***	(.848)		
7. Subjective Norm	---	---	---	.467***	.492***	.448***	(.842)	
8. PBC	---	---	---	.489***	.457***	.369***	.481***	(.847)
Between-group level (n = 39)								
1. Structural Social Capital	[.272] (.763)							
2. Relational Social Capital	.693***	[.315] (.831)						
3. Cognitive Social Capital	.477***	.679***	[.236] (.719)					
4. Knowledge Sharing	.371**	.257	.155	[.063]				
5. Intention	.332**	.392***	.311*	.380*	[.013]			
6. Attitude	.314*	.270	.379*	.366**	.349**	[.099]		
7. Subjective Norm	.506***	.525***	.342*	.482**	.421***	.337*	[.108]	
8. PBC	.558***	.536***	.501**	.485***	.430***	.389*	.558***	[.126]

[a] Coefficient alpha reliability estimates are in parentheses. ICC values are in brackets.

Finally, we included the following individual-level control variables: gender (dummy), age, professional experience and professional experience within the specific H&PCO (all measured as natural logarithm of the number of years), professional role (physician, psychologist, physiotherapist, nurse, healthcare assistant; all measured as dummies). We included organization dummy variables to account for differences across organizations.

Nature of social capital constructs

The appropriate specification of constructs represents a key concern in multilevel models, so Researchers need to be explicit regarding the levels of origin and measurement for each construct; where the construct is manifest within their theoretical model and where the level at which the construct is represented for purposes of statistical analysis (Klein and Kozlowski, 2000).

We investigate social capital as a team-level construct and refer to it as the assets and resources made available by the team members to each other, in terms of relationships with other units (Payne et al., 2011). Our measure emphasises team social capital as the product of "behaviors that are held in common by the members of a team" (Klein and Kozlowski, 2000, p. 215).

Specifically, team social is measured as the product of every team member enacting social bonding behaviours toward other units, such as 'have frequent interactions' 'talk freely', 'have a shared vision' (cf. Rojas et al., 2001 for similar approach and item selection). Hence, while the team represents the theoretically relevant level for social capital, we collected data at the individual level to represent how team members enacted (or experienced) social bonding with other units; we then tested through within-group agreement whether team members had comparable degrees of social capital. We assessed whether individual-level data showed substantial within-group agreement or homogeneity, i.e. intra-class correlation (ICC) higher than .10 and, if so, we aggregated individual-level data at team level of analysis. As Table 3 shows, ICC coefficients for social capital dimensions confirmed substantial within-group homogeneity. This supported our original interpretation of team social capital as a *shared* team property (Klein and Kozlowski, 2000).

To further support the alignment between the definition of our constructs and their measurement, we analyzed the amount of variation in our measures due to individual, team, and organizational characteristics. Specifically, we analyzed the amount of variation in all of our variables that was caused by measurement error (1−scale reliability), organization dummy variables (which include the organization effects), team dummy variables (which include the team effects), and individual differences ($1-R^2$ due to measurement error, $-R^2$ due to team differences, $-R^2$ due to organization differences). We reported the ICC for these variables at both the organizational level and team level. Table 3 summarizes the results of this analysis.

Table 3. Level of analysis

Scale	Measurement error	Organisation differences (between-organisation level)		Team differences (between-group level)		Individual differences (within-group level)
	R^2	R^2	ICC	R^2	ICC	R^2
Structural SC	24%	9%	0.089	40%	0.272	28%
Relational SC	17%	8%	0.087	43%	0.315	32%
Cognitive SC	28%	8%	0.081	37%	0.236	27%

Knowledge Sharing	29%	2%	0.004	23%	0.063	47%
Intention	20%	3%	0.015	19%	0.013	58%
Attitude	15%	7%	0.074	26%	0.099	52%
Subjective Norm	16%	1%	0.000	26%	0.108	57%
PBC	15%	8%	0.078	28%	0.126	49%

Social capital constructs show a significant amount of between-group variation (40% for SSC; 43% for RSC; 37% for CSC), compared to within-group variation due to individual differences that is roughly around 30% or less. This was expected and provides further evidence of the validity of our conceptualisation of social capital constructs as shared team property. Also, our analysis showed high ICC values for all social capital dimensions, giving support to our choice to model these constructs by aggregating individual-level data to the between-group level of analysis. The data show substantial variability between groups, disregarding the possibility of an overarching organizational social capital.

Otherwise, TPB and knowledge sharing constructs show a significant amount of within-group level variation (53% on average) due to individual differences, and a moderate-to-low amount of variance explained at the between-group and the between-organisation levels (24% and 4% on average, respectively). These figures confirm that TPB constructs can be analysed – after an appropriate decomposition - at both the between-group and within-group levels.

Analytical procedures

We conducted several diagnostic tests, taking appropriate corrective measures where needed. First, we screened the data from 226 usable questionnaires for univariate and multivariate normality. The results indicate moderate skewness (largest observed: -2.103) and kurtosis (largest observed: 6.734). The assumption of multivariate normality was not met ($p<.001$). Second, since we mainly collected data from individual respondents cross-sectionally, common method variance (CMV) was a concern (Spector, 2006). Following Podsakoff et al. (2003), we took procedural measures

to minimize the impact of CMV. We randomized the sequence of items in the survey, guaranteed confidentiality to respondents, emphasized that there were no correct/incorrect answers, asked respondents to provide independent and honest answers. We then carried out post-hoc tests. A Harman's single-factor test was conducted on crucial variables of our theoretical model, showing that there are eight factors and the highest variance accounted for by one factor is 28.60%, indicating minimal evidence of method bias (Harman, 1967). We conducted the test on social capital and TPB blocks separately. For the former, we used the between-group estimated covariance matrix computed by MPlus, which is a consistent estimator of the population between-group covariance matrix (Muthén, 1989); for the TPB block, we used the pooled within-group estimated covariance matrix, which is a consistent estimator of the population pooled within-group covariance matrix (see Table 3). Test results confirmed the outcomes of the uni-level analyses. Finally, an analysis using a single-method-factor approach advocated by Podsakoff et al. (2003) and Liang et al. (2007) also showed that CMV was not problematic. This approach consists in ascertaining that, after controlling for the effects of an unmeasured latent method factor in our structural model; all path loadings of the hypothesized indicators with their respective constructs remain statistically significant. We conducted this test using a Partial Least Squares approach, whereby a model not including a method factor was compared with a model including it. The results showed that CMV was unlikely to have any substantial impact on our results.

We then proceeded with evaluating the model through multilevel structural equation modelling (MSEM). We employed Mplus version 7.0 (Muthén and Muthén, 2012). Following Stapleton (2006) and Hox (2010), we assessed our model in two phases. The first phase aims to confirm the presence of a theoretical structure at the between-group level. In the second phase, a structural model is specified and estimated.

Results

Multilevel analyses

We assessed the structure of our study variables performing multilevel confirmatory factor analysis. We first assessed whether a between-group level structure is present (Hox, 2010). Consistently with previous research (e.g., Ailawadi et al., 2001), we split our model into two blocks: social capital and a TPB block due to high number of constructs and moderate number of observations. Table 4 present the results for the social capital block.

Table 4. CFA models to test the presence of between effects for SC block

Step	Team-Level	chi-square	df	TLI	CFI	SRMR	RMSEA
1	Null	1399.011	132	-	-	0.826	0.196
2	Independence	267.311	117	0.881	0.866	0.727	0.077
3	Between-group level structure	150.047	97	0.958	0.943	0.069	0.050

We first estimated a between-group level null model. As expected, since no theoretical structure was specified, we obtain a poor fit. We calculated the ICCs for every social capital variable. A sizeable percentage of the variance of structural (SSC=40%), relational (RSC=43%) and cognitive social capital (CSC=37%) is explained by group variation. Next, we examined a second model where we constrained the between-group level covariance matrix to be diagonal. If this model holds, between-group level variation is present, but there is no relevant structural model. This model could be rejected. Finally, we modelled the between-group level variation by specifying a congeneric measurement model. The chi-square goodness-of-fit index, CFI, TLI and RMSEA indexes perform well, and the SRMR index reports a strong improvement. Because all fit statistics indicate reasonable fit, we conclude that our model is acceptable and between-group level variance justifies further examination of the hypotheses at between-group level.

We used the step-3 model to test the psychometric properties of our measures. The reliability of our measures is assessed through Cronbach's Alphas. Since reliabilities exceeded the .7 level for every social capital construct, we conclude that our measures are reliable. Next, we examined the statistical significance and magnitude of the estimated factor loadings to assess convergent validity. All factor loadings exceed the recommended .7 value (lowest value, SSC4: .710) and are highly significant. The average variance extracted (AVE) for each construct is greater than the .5 recommended threshold (Hair et al., 2007) (lowest value, CSC: .730). Our social capital measures display convergent validity.

Finally, we evaluated the discriminant validity of our measures through the squared correlations for any couple of construct. For any couple, individual AVEs are larger than interconstruct squared correlations. The fact that our measurement model is specified as congeneric model, and fit measures are appropriate, can be considered further proof for the discriminant validity of our social capital measures (Hair et al., 2007).

Table 5 presents the results for the TPB block.

Table 5. CFA models to test the presence of between effects for TPB block

Step	**Team-level**	**chi-square**	**Df**	**TLI**	**CFI**	**SRMR [within-group level] (between-group level)**	**RMSEA**
1	Null	320.196	196	0.979	0.977	[0.061] (0.874)	0.054
2	Independence	321.617	188	0.978	0.974	[0.061] (0.735)	0.057
3	Between-group level structure	295.068	174	0.980	0.975	[0.054] (0.072)	0.056

Following Hox (2010), we analyzed a between-group level null model, which yielded overall unsatisfactory fit statistics. While CFI, TLI and RMSEA indexes suggested that the model could be accepted, the SRMR index for the between-group level structure indicated a strong misfit. These results suggest that the null model could not be accepted. Next, we estimated a between-

group level model where the between-group level covariance matrix was constrained to be diagonal. While CFI, TLI and RMSEA remained substantively unchanged, the SRMR showed a relative improvement. The SRMR value for the between-group level model exceeded the acceptable threshold suggesting that the model was still not fitting the data. Finally, we modelled the between-group level variation by specifying a congeneric measurement model and observed a strong improvement in the SRMR fit index for the between-group level part of the overall model. All fit indexes indicated that the model was acceptable and that between-group level variance justifies further examination of the hypotheses at between-group level.

We used the step-3 model to test the psychometric properties of our measures of the TPB constructs. First, the Cronbach's Alphas for each construct exceeded the .7 level. Next, all factor loadings are highly significant and exceeding the .7 value, apart from three cases (SN1: .677; KS3: .672; KS4: .627). Since the lowest value still exceeds the .5 threshold, we retained them. All AVEs also exceed the minimum .5 recommended level (Hair et al., 2007), thus providing further support for convergent validity (lowest AVE, KS: .525). Finally, we assessed the discriminant validity of our measures by calculating the squared correlations for each couple of construct. For any couple, individual AVEs are each larger than interconstruct squared correlations. The TPB block was specified as a congeneric model and reported appropriate fit measures. Hence, our TPB measures display discriminant validity.

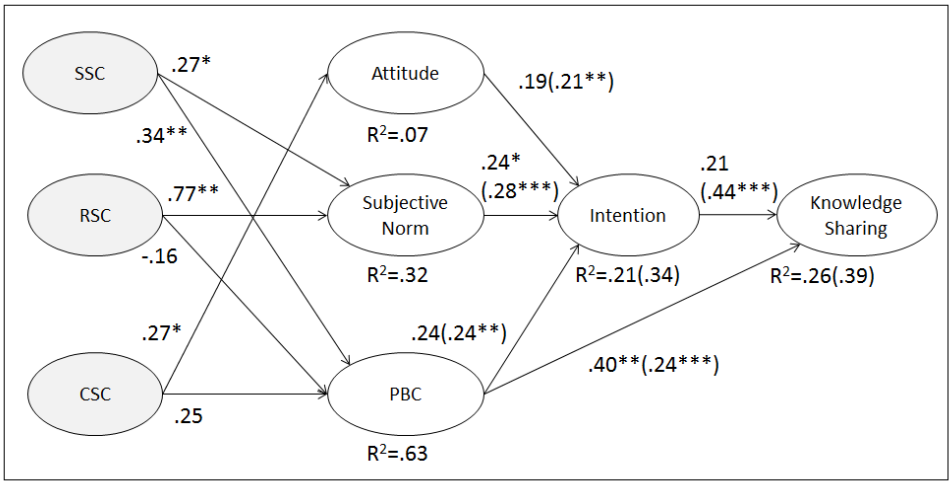
Hypotheses testing

We calculated latent variable scores by creating scale averages for each scale, to retain statistical power. This procedure introduces some bias in the estimated parameters, especially at the within-group level where measurement errors tend to accumulate. However, 'if the sampling ratio is high (i.e., when the cluster size is finite and we select a large proportion of individuals from each cluster), the manifest group mean may be a good proxy for group standing' (Preacher et al., 2010,

p. 222). Furthermore, we are interested in between-level effects rather than within-level effects, so the bias from summated scales is likely to be very limited.

We assessed the entire model with different fit measures: chi-square value (29.182, df: 16), CFI (.951), TLI (.901), RMSEA (.061) and SRMR for both within-group (.014) and between-group (.066) models. The fit indexes are all within acceptable ranges; our model fits the data adequately well. Figure 1 shows the standardized structural coefficients for within-group and between-group levels of analysis.

Figure 1. Between- and within-group level structural model with standardised coefficients[a]



[a] Within-group coefficients are in parentheses. *p< .05; **p<.001; ***p<.001

Our results support Hypotheses 2A and 2B, which explored the effect of structural social capital on subjective norm (β=.27, p<.05) and PBC (β=.34, p<.01). Also, we found significant statistical support for Hypothesis 3B, which states that relational social capital positively influences subjective norm (β=.77, p<.01). Hypothesis 3A was not supported, as the influence of relational social capital on PBC was not statistically significant (β=-.16, p>.05). Hypothesis 4A was supported, as cognitive social capital significantly and positively affects attitude (β=.27, p<.05). Hypothesis 4B was not supported as the effect of cognitive social capital on PBC was not

statistically significant (β=.25, p>.05). The model explained 7% of the variance in the between-group component of attitude, 32% of the variance in the between-group component of subjective norm, and 63% of the variance in the between-group component of PBC.

We then explored the direct antecedents of knowledge sharing. The relationships were examined at within- and between-group levels. The relationship between attitude and intention was significant at within-group (β=.21, p<.01) and between-group (β=.19,p<.05) levels, hence supporting Hypothesis 1A. The relationship between subjective norm and intention was significant at within-group (β=.28, p<.001) and between-group (β=.24, p<.05) levels, hence supporting Hypothesis 1B. The relationship between PBC and intention was significant at within-group level (β=.24, p<.01), but not at between-group level (β=.24, p>.05), hence supporting Hypothesis 1C at within-group level only. The effect of intention on knowledge sharing was significant at within-group level (β=.44, p<.001), but not at between-group level (β=.21, p>.05), hence supporting Hypothesis 1D at within-group level only. The effect of PBC on knowledge sharing was significant at within-group (β=.24, p<.001) and between-group (β=.40, p<.01) levels, hence supporting Hypothesis 1E. Overall, the results provide support of the TPB framework at within-group level, indicating that team members with greater attitude, subjective norm and PBC also displayed greater intention to share, and greater knowledge sharing. The results provide some support to the TPB framework extended at between-group level; indicating that teams with greater attitude and subjective norm also displayed on average greater intention to share. This is not the case for PBC-intention and intention-sharing. These combined results are consistent with prior research, which indicates that the TPB explains behaviours at the individual level of analysis, and cannot be necessarily ‘stretched’ at team level (cf. Ajzen, 1991)

The model explained 34% of the variance in the within-group component of intention, 21% of the variance in the between-group component of intention, 39% of the variance in the within-group component of knowledge sharing and 26% of the variance in the between-group component of knowledge sharing.

Our overall model supports that the link between team social capital and knowledge sharing is fully mediated by TPB constructs. To further corroborate this, we specified a partial mediation model where social capital directly affects the between-group component of knowledge sharing. Results revealed that the partial mediation specification has poorer fit than the full mediation specification (fit indexes for the partial mediation model are: chi-square: 26.834, df: 13; CFI: .944; TLI: .863; RMSEA: .070; SRMR within: .014; SRMR between: .067). In addition, direct effects of social capital on knowledge sharing behaviour at the between-group level were not significant (SSC:-.003, p>.10; RSC:.045, p>.10; CSC:-.171, p>.10). The full mediation model was thus a more appropriate representation of our data.

Finally, we analyzed the effects of control variables. Since all control variables were conceptualized at the individual level and potentially affect only the TPB block, we conducted a hierarchical analysis of the regression predicting knowledge sharing behaviour. To account for the non-independence of our observations, we included organization dummy variables and used bias-corrected and accelerated bootstrapped standard errors with 1000 replications. Although some of the control variables have separate explanatory power, our overall results correspond to the findings from our multilevel model and the significance of our key relationships remains substantially unaltered. Table 6 summarizes the results of each hypothesis.

Table 6: Summary of Results

Hypothesis	Link	Sign	Result
H1a	*Attitude → Intention*	+	*Supported (within and between group)*

H1b	*Subjective Norm → Intention*	+	*Supported (within and between group)*
H1C	*Perceived Behavioural Control → Intention to share*	+	*Supported (within group)*
H1D	*Perceived Behavioural Control → Knowledge Sharing*	+	*Supported (within and between group)*
H1E	*Intention to share → Knowledge Sharing*	+	*Supported (within-group)*
H2a	Team Structural Social Capital → Subjective Norm	+	Supported
H2b	Team Structural Social Capital → Perceived Behavioral Control	+	Supported
H3a	Team Relational Social Capital → Perceived Behavioral Control	+	Non Supported
H3b	Team Relational Social Capital → Subjective Norm	+	Supported
H4a	Team Cognitive Social Capital → Attitude	+	Supported
H4b	Team Cognitive Social Capital → Perceived Behavioral Control	+	Non Supported

Discussion

Our study adopted Coleman's (1990) network closure theory and tested whether teams' social bonding with other units is related to higher knowledge sharing behaviours among team members. While Coleman's theory suggests that close relationships provide richer and safer opportunities to share knowledge; other studies painted a more problematic picture, i.e. social bonding might be a deterrent to knowledge sharing because actors become 'too similar', possess redundant knowledge and have limited interest in others' knowledge (e.g., Burt, 2001; Comeau-Vallée and Langley, 2020; Finn et al., 2010; Liberati et al., 2016). This contradictory theoretical framework provides unclear indications to practice, as Coleman's network closure theory suggests that organizations should bring their teams/units closer to each to stimulate workers' knowledge sharing; while other studies suggest that this could be counter-productive and teams/units should distance themselves to produce non-redundant knowledge that is worth sharing. Building upon this, our research tested Coleman's hypothesis in an empirical context that could challenge its application. The various units in an H&PCO were designed to be very similar in terms of composition (e.g. doctors and nurses), operations (e.g. state-of-art practices in palliative care) and goals (e.g. provide the best palliative intervention to patients); hence social bonding could posit a risk of cognitive lock-in.

Still, our findings suggest that greater closure between 'similar' teams did provide significant psychological motives to engage with knowledge sharing towards the rest of the organization. Empirically, we suggest, the H&PCO units dealt with different patients, hence they had reasons to share at least their ever-evolving knowledge on customer service and front-line experience.

More than supporting the social bonding hypothesis, our findings show that each dimension of team social capital relates significantly and positively to knowledge sharing. Teams which capitalize on frequent, intense *and* cognitively assonant interactions with other units do stimulate their members into sharing knowledge. Our study adds to the notion, central to behavioural operations, that workers' behaviours resonate with properties and dynamics of the groups in which they are embedded in two ways (Bendoly et al., 2006, 2010; Donohue et al., 2020; Gino and Pisano, 2008). On the one hand, we highlight that teams' social capital correlates positively with team members' psychological evaluation of knowledge sharing. We found that individuals embedded in teams with higher social capital are more likely to develop greater attitudes, subjective norms, and PBC towards knowledge sharing than peers embedded in teams with less social capital. These psychological antecedents in turn translate into greater individual propensity to share knowledge outside of team boundaries. This latter result provides additional confirmation to the validity of the theory of planned behaviour, applied to knowledge sharing across any context (e.g. Armitage and Conner, 2001; Bock et al., 2005; Godin and Kok, 1996; Kuo and Young, 2008; Lin and Lee, 2004; Radaelli et al., 2015; Ryu et al., 2003; Scuotto et al., 2020; Shirahada and Zhang, 2021; Ulker-Demirel and Ciftci, 2020). On the other hand, our results provide insight into how different forms of social bonding stimulates knowledge sharing through peculiar mechanisms, i.e. structural social capital increases individuals' PBC and subjective norm; relational social

capital increases their subjective norm, and cognitive social capital increases their attitude toward knowledge sharing.

The role of structural social capital shows how the 'quantity' of social bonding (measured as the frequency of interactions) between the team and external actors stimulates individuals in two ways, i.e. it increases the perception that knowledge is easy and safe, and the willingness to comply with social expectations. Social bonding may thus stimulate individuals through mechanisms of *access*, i.e. individuals find more opportunities to share, and *visibility*, i.e. individuals have more occasions to observe, and be observed (so they can better control where knowledge lands more safely).

The role of relational social capital partly differs from our expectations. The 'quality' of social bonding (measured as trust and mutual support) between the team and external actors stimulates individuals' subjective norm only. Behavioural operations studies have looked into the role of trust and trustworthiness in the social network, showing that individuals do not simply make rational calculations, but attend to the needs of people they care and/or trust (Donohue et al., 2020). Our results suggest that close ties shared by teammates shape workers' desire to comply with social expectations, and enact behaviours that are socially approved. This supports a 'reciprocity' and 'groupthink' interpretation of social ties. On the one hand, individuals may become more willing to nourish a trusted relationship with altruistic behaviours such as knowledge sharing; failing to do so may compromise teams' relationship with others. On the other hand, relational social capital represents a feature of the team, not of the individual. Hence, team members may feel an obligation to sustain team-level relationships through knowledge sharing, i.e. teammates are likely to develop specific expectations that new knowledge is shared with 'friends'. Failure to do so may compromise individuals' status inside the team.

Trusted relationships provided by teams do not make knowledge sharing easier for the individual member. The results related to PBC diverge from previous research, which highlighted a combined effort of the structural and relational dimensions on PBC (Hansen, 1999; Levin and Cross, 2004; Reagans and McEvily, 2004). We interpret this result to indicate that trust and mutual support may not help with more material problems related to knowledge sharing, e.g. engage with several and long interactions with another person to properly transmit complex knowledge. Individuals may have trusted relationships without prolonged and frequent interactions, and fear that knowledge could be misunderstood or knowledge sharing time-consuming.

Finally, our results confirm that employees' attitude is an important antecedent of knowledge sharing (Ryu et al., 2003); and remark a role for teams' cognitive social capital. Teams' high cognitive social capital represents a scenario in which teams as a whole share purposes and goals with the rest of the organization. Higher cognitive assonance does not make knowledge sharing 'easier' for the individuals nor increases their PBC. This result might suggest that the cognitive assonance of goals and interests is not perceived as a strong requirement for employees' intention to share knowledge. Rather, it improves their perception that better results could be achieved through collaboration. The convergence of goals and aspirations may engender an element of 'communion' between knowledge transmitters and recipients; and expectations that knowledge recipients would use the shared knowledge in ways that benefit the transmitter too.

Conclusions

Our study contributes to studies of behavioural operations by showing a positive, significant, relationship between team social capital and workers' propensity to share knowledge with other organizational units. This result is consistent with Coleman's (1990) social bonding hypothesis, and suggests that greater visibility of and from other units generate motivations, social pressures

and opportunities to act altruistically. This positive effective seemingly outweighs the fears of intrusion and teams' tendency to cognitive lock-in (Comeau-Vallée and Langley, 2020; Finn et al., 2010; Liberati et al., 2016). Our results provide at least two immediate practical implications to practitioners. One is related to the importance of teams' social bonding towards external units to motivate team members internally. Past research noted that team social bonding improves the possibility to retrieve and absorb knowledge from other units, on the basis that these units are more willing to share knowledge with the team, while the team has more time and ease to overcome problems of knowledge stickiness (e.g. Oh et al., 2006; Szulanski, 1996). Our study connects this property with team members' own motivation to share their new knowledge (e.g. customer experiences) with others. This translates into a decisive recommendation for organizations to support teams into establishing all three dimensions of social capital (i.e. frequent interactions, durable and trust-based relations, and exchanged informed by shared goals and meanings) in order to stimulate every key psychological antecedent of knowledge sharing (i.e. greater perception of benefits, better disposition to social influences, and greater perception of control over implementation and implications). The latter point connects to our second practical implication, i.e. the explanatory role of the Theory of Planned Behavior to understand why individuals intend to perform volitional behaviours (cf. Ajzen, 1991). We already noted how deeply established this theory is in the literature; this is arguably less evident in practice – so we suggest the key importance of measuring and analysing workforce's attitude, subjective norm and perceived behavioural control in order to identify gaps and tailor improvements on these.

To conclude this paper, we must emphasize the cross-sectional nature of our study and remark the impossibility to draw definitive inferences about the cause-effect mechanisms connecting team external social capital with employees' intention to share knowledge. Our results

ultimately suggest that possible cause-effect mechanisms between team social capital and knowledge sharing might be worth exploring through more specific research approaches. We suggest three further avenues for further research. First, we measured three forms of social bonding (frequency, intensity, and cognitive assonance) as measures of social capital. Following Payne et al. (2011), future research can focus on more specific resources, such as knowledge and information shared within the team as further social capital enablers of knowledge sharing. Second, while the peculiar setting of H&PCOs was exemplary to test our hypotheses, future research might expand our model in different settings, e.g. in more traditional firms or professional settings, to investigate the transferability of our findings when the internal dynamics of the team are generally more complex and divisive; and to explore the role of specific contingencies. Finally, the sample size was sufficient to ensure statistical significance of the results – as detailed in the Methods section – and is consistent with that of other studies published in high-quality management journals (e.g. Gargiulo and Benassi, 2000). We recognize that our sample size is only moderate, and a larger number of observations, especially at the between-group level of analysis, would make the parameter estimates even more reliable, and positively contribute to statistical power.

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Appendix A. Survey Questionnaire (for review only)

We provided respondents with the following definition of knowledge on which they should refer to when answering the survey. "We define knowledge as information useful for your clinical practice. Particularly, we refer to tacit knowledge being exchanged among professionals, and that relates to how and what treatment decisions can be translated into a clinical pathway that best supports patients and familiars in the last stages of patient's life." We instructed respondents on the levels of analysis relevant for each construct. Particularly, the term 'colleagues in my organizational units' referred to professionals in other organizational units, and not necessarily inside the team.

Structural Social Capital	
SSC1	There is a frequent interaction with personnel of organisational units to improve patient care
SSC2	In my organisational units, the interpersonal relationships between professionals are very frequent
SSC3	Colleagues in my organisational units exchange ideas with many coworkers
SSC4	In my team, employees exchange ideas with numerous professionals from other units
Relational Social Capital	
RSC1	Colleagues in my organisational units are always willing to help if I need it
RSC2	When I need help, I can always turn to colleagues of my organisational units
RSC3	I have trouble to trust many of my colleagues because they are opportunists (R)
RSC4	With colleagues in my organisational units, I can talk freely about my problems
Cognitive Social Capital	
CSC1	I frequently conflict with colleagues in my organisational units on what is most important in daily
CSC2	My colleagues and I often enter into conflict over choices made for the improvement of daily practice
CSC3	My colleagues and I have a shared vision of the direction that my organisation should take
CSC4	My colleagues and I share the same enthusiasm about the objectives proposed by my organisation
Attitude	
A1	I believe that sharing my knowledge will help me to improve my practice
A2	I believe that sharing my knowledge will help me to provide more rapid cures to patients
A3	I believe that sharing my knowledge will help me to develop new solutions for my practice
A4	I believe that sharing my knowledge will help me to use resources more efficiently
Subjective Norm	
S1	Colleagues who are most important to me believe that I should share my knowledge
S2	Colleagues who are most important to me frequently share their knowledge
S3	Colleagues who work on my team believe that I should share my knowledge
S4	Colleagues who are most important to me believe that knowledge sharing represents a fundamental activity for the organisation
Perceived Behavioural Control	
PBC1	I can devote enough time to sharing my knowledge
PBC2	Due to my workload, I have difficulties in effectively sharing my knowledge (R)
PBC3	The sharing of knowledge is supported by the climate in my organisational unit
PBC4	The climate in my organisational unit facilitates informal meetings where knowledge is shared
Intention	
I1	I intend to frequently share my knowledge with my colleagues
I2	I will always give my knowledge to those who ask for it
I3	I will always try to give my knowledge to others in the most efficient way possible
I4	I intend to frequently share my working experiences with my colleagues
We asked team leaders to provide an assessment of the following items for each team member	
KS Behaviour	
KS1	Usually spends a lot of time sharing knowledge with colleagues
KS2	During meetings, is usually very active in sharing knowledge with colleagues
KS3	Customarily engages in informal meetings with colleagues in which s/he shares working experiences
KS4	Is usually quick in responding to colleagues' requests to share knowledge