



# Healthcare professionals' evaluation of interprofessional teamwork and job satisfaction

## Evaluation der Teamarbeit und der Arbeitszufriedenheit von Gesundheitsfachberufen

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### Abstract

Interprofessional teamwork among healthcare professionals in healthcare organizations is a key factor for both their job satisfaction and patients' effective and efficient treatment. One precondition for successful interprofessional teamwork is a shared mental model (a common cognitive frame of reference and knowledge) of working together as a team. However, there often exist subcultures, and each of these has its own mental model of teamwork. Hence, it can be assumed that different healthcare professional groups do not share the evaluation of their interprofessional teamwork and job satisfaction (Hypothesis 1). Additionally, based on the input–process–output model of team effectiveness, it can be expected that interprofessional teamwork determines job satisfaction (Hypothesis 2). These hypotheses were tested in a survey of 272 employees in 15 rehabilitation clinics in Germany. Results showed that healthcare professionals' evaluation of their interprofessional teamwork ( $F(3, 203) = 9.118, p < 0.001, \eta^2 = 0.119$ ) as well as their job satisfaction ( $F(3, 210) = 3.357, p = 0.02, \eta^2 = 0.046$ ) differed significantly. Physicians reported the highest level of interprofessional teamwork and job satisfaction compared with other groups. Perceptions of interprofessional teamwork explain approximately 20% of the variance in job satisfaction. Thus, both hypotheses were confirmed. Interprofessional interventions in education and practice are recommended to establish a shared mental model, which could improve teamwork and subsequently job satisfaction.

### Abstract

Interprofessionelle Teamarbeit verschiedener Gesundheitsfachberufe in Einrichtungen der Gesundheitsversorgung ist sowohl für die Arbeitszufriedenheit als auch für eine effektive und effiziente Patientenversorgung ein grundlegender Faktor. Eine Voraussetzung für eine erfolgreiche interprofessionelle Teamarbeit ist ein geteiltes mentales Modell (ein gemeinsamer kognitiver Bezugsrahmen und gemeinsames Wissen) zur Zusammenarbeit im Team. Allerdings existieren hier häufig Subkulturen und jeder Gesundheitsfachberuf hat sein eigenes mentales Modell der Teamarbeit. Daher kann angenommen werden, dass die verschiedenen Gesundheitsfachberufe nicht zu einer einheitlichen Bewertung der interprofessionellen Teamarbeit und Arbeitszufriedenheit gelangen (Hypothese 1). Zudem kann basierend auf dem Input-Prozess-Output Modell der Teameffektivität angenommen werden, dass die interprofessionelle Teamarbeit die Arbeitszufriedenheit bestimmt (Hypothese 2). Diese Hypothesen wurden in einer Befragung von 272 Mitarbeitern unterschiedlicher Gesundheitsfachberufe in 15 Rehabilitationskliniken in Deutschland überprüft. Die Ergebnisse zeigen, dass die Bewertungen der interprofessionellen Teamarbeit ( $F(3, 203) = 9.118, p < 0.001, \eta^2 = 0.119$ ) sowie der Arbeitszufriedenheit ( $F(3, 210) = 3.357, p = 0.02, \eta^2 = 0.046$ ) sich signifikant unterscheiden. Im Vergleich zu den anderen Gesundheitsfachberufen bewerteten Ärzte die interprofessionelle Teamarbeit und Arbeitszufriedenheit am besten. Die Wahrnehmung der interprofessionellen Teamarbeit erklärt in etwa 20% der Varianz von der Arbeitszufriedenheit. Somit konnten beide Hypothesen bestätigt werden. Interprofessionelle Interventionen in Aus- und Weiterbildung werden empfohlen, um ein gemeinsames mentales Modell zu fördern, welches die Teamarbeit und in Folge auch die Arbeitszufriedenheit verbessern kann.

### Keywords

Interprofessional relations – questionnaire design – quantitative method – interdisciplinary – professional identity – teamwork – job satisfaction

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Interprofessionelle Beziehung – Fragebogen – quantitative Methode – Interdisziplinarität – professionelle Identität – Teamarbeit – Arbeitszufriedenheit



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## INTRODUCTION

Chronic diseases need to be treated by teams of professionals from different sectors of health care. Rehabilitation care in Germany is based on a comprehensive care approach and mostly takes place at in-patient rehabilitation clinics, where different healthcare professionals work together in an interprofessional team. Interprofessional teamwork is thereby perceived as a key feature of the comprehensive chronic care approach (Schaefer & Davis, 2004; Sinclair, Lingard, & Mohabeer, 2009; Stock, Reece, & Cesario, 2004; Wagner, 1998; Wagner et al., 2001). It is defined as a partnership “in a participatory, collaborative and coordinated approach to shared decision-making around health and social issues” of the patients (Canadian Interprofessional Health Collaborative, 2010, p. 11). The National Competency Framework of the Canadian Interprofessional Health Collaborative (2010) mentions leadership, conflict resolution, team function, role clarification and communication as the main domains of interprofessional teamwork in health care. Salas, Sims, & Burke (2005) defined the core dimensions of teamwork as leadership, mutual performance, monitoring, backup behaviour, adaptability and team orientation, as well as coordinating mechanisms such as closed-loop communication, mutual trust and shared mental models. In settings with a high workload and time pressure, such as in health care, a shared mental model is especially important as a coordinating mechanism for high-performance teams (Mathieu, Heffner, Goodwin, Salas, & Cannon-Bowers, 2000; Salas et al., 2005). Shared mental models have a significant positive effect on teamwork and team performance (DeChurch & Mesmer-Magnus, 2010a) and are defined as team members’ shared and organized understanding of relevant knowledge of the task (e.g. aim, work process, division of work, methods and tools) and the team (e.g. team members’ characteristics, such as skills and expertise, roles and responsibilities, information flow, communication channels) (Burtscher & Manser, 2012; Cannon-Bowers, Salas, & Converse, 1993; DeChurch & Mesmer-Magnus, 2010b; Mohammed, Klimoski, & Rentsch, 2000; Steinheider, Menold, & Bromme, 2009). The shared mental model theory can be used to explain how teams adapt to changing task demand (Mathieu et al., 2000). “Adaptable teams are those who understand well and can predict the nature of team interactions” (Mathieu et al., 2000, p. 275). Knowledge integration in terms of shared mental model is often used to explain team functioning (Burtscher & Manser, 2012; Cannon-Bowers et al., 1993; Mathieu et al., 2000; Steinheider et al., 2009). Thereby, it is an important factor in the theoretical team effectiveness models (input–process–output models) that illustrate the relationship between input, process and output (Campion, Medsker, & Higgs, 1993; Campion, Papper, & Medsker, 1996; Gladstein, 1984; West, 2004; Xyrichis & Ream, 2008). Job satisfaction is often used to operationalize output (Campion et al., 1993; Campion et al., 1996; Körner, 2008) on the staff level because of its association with patient outcomes (Chang, Ma, Chiu, Lin, & Lee, 2009; Kazanjian, Green, Wong, & Reid, 2005; O’Leary, Sehgal, Terrell, & Williams, 2012). Job satisfaction is defined as “a pleasurable or positive emotional state resulting from the appraisal of one’s job or job experiences” (Locke,

1976, p. 1304). Some international studies have shown that teamwork predicts job satisfaction (Aiken, Sloane, Bruyneel, van den Heede, & Sermeus, 2013; Chang et al., 2009; Kalisch, Hyunwa & Rochman, 2010; Lemieux-Charles & McGuire, 2006).

However, international studies have alluded to the fragmentation of health care (Reeves et al., 2010), to the professionals’ restricted realm “silos” (healthcare professional groups working within their own professional group rather than collaborating with colleagues in other disciplines) and to different cultures within each healthcare profession as barriers for effective interprofessional teamwork or as obstacles in the implementation of interprofessional educational programmes (Braithwaite, 2010; Delva, Jamieson, & Lemieux, 2008; Hall, 2005; Margalit et al., 2009; Pecukonis, Doyle, & Bliss, 2008). The healthcare professionals “differ in their education, status, language and theoretical orientations to teamwork” (Mickan & Rodger, 2005, p. 359), or rather, they have different cognitive maps (Petrie, 1976). Two different healthcare professionals “can look at the same thing and not see the same thing ...” (Petrie, 1976, p. 35) as a result of educational and socialization experiences (Hall, 2005). Therefore, it is likely that they do not share the same mental model.

## AIM OF THE STUDY AND RESEARCH QUESTIONS

To the best of our knowledge, no existing study has explored healthcare professionals’ evaluation of interprofessional teamwork and job satisfaction as well as the association between these two aspects for interprofessional teams in Germany. Hence, the aim of our study is twofold: (1) to analyse the evaluation of teamwork and job satisfaction from different healthcare professionals’ perspectives and (2) to evaluate the impact of teamwork on job satisfaction. Based on the above-mentioned “professional silos”, our first hypothesis is that healthcare professionals with differing occupations do not share a perception of interprofessional teamwork (H1a) nor do they have the same level of job satisfaction (H1b). Moreover, on the basis of team effectiveness models and judging by preliminary evidence, we hypothesize that interprofessional teamwork is an antecedent of job satisfaction (H2).

## METHODS

A multicentre, cross-sectional study was conducted, with the data collected in a staff survey. Twenty-two in-patient medical rehabilitation clinics in southwest Germany had expressed initial interest in the study; 15 of these participated. The clinics treated different chronic diseases. Six were psychosomatic clinics, whereby four of these specialized in the treatment of addiction. The remaining nine were somatic rehabilitation clinics with a wide range of indications (orthopaedics, cardiology, neurology, oncology, metabolism and pneumology), some specializing in two or more indications. Each clinic designated a contact person (mostly a senior physician or psychologist): all questionnaires ( $N = 662$ ) were sent to these contact persons, who distributed them to healthcare professionals in their clinic. We also sent out reminders 2 weeks after the deadline.



The two inclusion criteria were that the healthcare professionals – physicians, nurses, physical therapists (masseurs, physical therapists, sports therapists and balneotherapists), psychosocial therapists (psychotherapists, social workers, special therapists (e.g. art or dance therapists) and others (such as dieticians, speech therapists, counsellors and teachers) – were working (1) within a treatment team and (2) participated directly in patient treatment. The study was approved and supported by the ethics committee of the University of Freiburg.

Perceived interprofessional teamwork was measured using the *Internal Participation Scale* (IPS) (Körner & Wirtz, 2013), which is based on the model of integrated patient-centredness and captures the core dimensions of teamwork identified by Valentine, Nembhard, & Edmondson (2013). The scale items represent communication (“Communication in the team is efficient”) and cooperation among healthcare professionals (“The health care professionals work hand-in-hand”), coordination of treatment options within the interprofessional team (“The different types of treatment are well coordinated”), coordination of healthcare professionals (“Agreements amongst health care professionals are well coordinated”) respect among healthcare professionals (“The health care professionals respect each other”) and climate within the interprofessional team (“Overall there is a friendly climate in the clinic”).

The six IPS items were assessed on a four-point Likert scale (1 = does not apply at all, 2 = does not generally apply, 3 = generally applies, 4 = fully applies), with the possibility to check “I can’t judge this”. When calculating the total score (team score), one missing item was accepted. The psychometric properties of the IPS are good. Acceptance of the items (completion rate) is high, with a range between 93.6 and 99.6, and the discrimination index for all items lies above 0.4. Reliability measured with Cronbach’s  $\alpha$  amounts to 0.87, while the explained variance of the construct *internal participation* is 61%. Construct validity is evident. This is shown by the high correlation of IPS with similar constructs from the scales of the Questionnaire on Staff Satisfaction in Medical Rehabilitation (convergent validity) (Farin, Meixner, Follert, Jäckel, & Jacob, 2002; Farin, Meixner, & Jäckel, 2013), such as organization and communication ( $r = 0.578$ ), workplace atmosphere ( $r = 0.748$ ) and leadership appraisal ( $r = 0.551$ ) and low correlation ( $r = 0.249$ ) with external participation (discriminant validity) (Körner & Wirtz, 2013).

Job satisfaction was measured using the item “How satisfied are you in general with your job?” from the above-mentioned questionnaire by Farin and colleagues (2013), which is assessed on a five-point Likert scale (1 = very dissatisfied, 2 = dissatisfied, 3 = neither satisfied nor dissatisfied, 4 = satisfied, 5 = very satisfied). The psychometric criteria for the items used were examined and considered to be good (Farin et al., 2002).

Data quality was tested by verifying random samples in which the items were inspected for plausibility and missing data. Questionnaires with more than 30% of items unanswered were excluded. Univariate analysis of variances (ANOVA) was used to compare healthcare professionals’ evaluation of interprofessional teamwork (H1a) and their job satisfaction (H1b). Post hoc tests (Scheffé) were used to determine which groups differ significantly from each other. The size of the difference among the groups was determined using partial Eta-square ( $\eta^2$ ), categorized as follows:  $\eta^2 = 0.01$  (small);


Table 1. Description of sample ( $n = 272$ ).

	Count	Percent
<b>Gender</b>		
Male	94	34.6
Female	164	60.3
Missing	14	5.1
<b>Age</b>		
17-25	12	4.4
26-35	40	14.7
36-45	82	30.1
46-55	88	32.4
56-65	38	14.0
Missing	12	4.4
<b>Healthcare professional groups</b>		
Physicians	49	18.0
Nurses	48	17.7
Psychosocial therapists	67	24.6
Physical therapists	50	18.4
Others (e.g. dieticians, speech therapists, occupational therapists)	37	13.6
More than one profession	12	4.4
Missing	9	3.3
<b>Job tenure</b>		
Less than 1 year	13	4.8
More than 1 year but less than 3 years	37	13.6
Three to 5 years	26	9.6
More than 5 years	190	69.8
Missing	6	2.2
<b>Employment</b>		
Full-time	174	64.0
Part-time (more than 70% but less than 100%)	41	15.1
Part-time (more than 50% but less than 70%)	35	12.9
Part-time (less than 50%)	14	5.1
Missing	8	2.9

$\eta^2 = 0.06$  (medium);  $\eta^2 = 0.14$  (high) (Cohen, 1988). Linear regression analysis (method: enter) was performed to determine whether interprofessional teamwork is associated with job satisfaction (H2). All data analyses were conducted with the IBM Statistical Package for Social Science (SPSS) 21 for Windows.

## RESULTS

Six hundred and sixty-two questionnaires were distributed to healthcare professionals in 15 rehabilitation teams; 275 were returned (41.6%). Table 1 shows the characteristics of our sample of healthcare professionals. Three questionnaires were excluded due to missing



information, leaving 272 for evaluation. The distribution of the different medical fields is roughly equal, with psychosocial therapists slightly in the majority. Most of the healthcare professionals were aged between 26 and 55, worked full-time and had worked more than 5 years in the clinic. More women (60.3%) than men (34.6%) participated.

The assumptions in analysis of variance (normality of residuals and homogeneity of variances) were not fulfilled. Nevertheless, the analysis method is used, because it is rated as robust against violations of its assumptions. There is a significant variation in the evaluation of teamwork among the four main groups of healthcare professions (physicians, nurses, physical therapists and psychosocial therapists):  $F(3, 203) = 9.400, p < 0.001, \eta^2 = 0.122$ . Due to the heterogeneity of the category “others”, this group was not considered in the subsequent analysis. Physicians reported the highest level of interprofessional teamwork compared with other groups (see Table 2). They differ significantly from nurses ( $p = 0.005$ ) and psychosocial therapists ( $p = 0.001$ ). Physiotherapists rated the interprofessional teamwork almost as high as the physicians. Thus, there are also significant differences between the physiotherapists and the nurses ( $p = 0.018$ ) and the psychosocial therapists ( $p = 0.004$ ).

Evaluation of job satisfaction also differs significantly (see Table 2), although the effect is small ( $F(3, 210) = 3.357, p = 0.02, \eta^2 = 0.046$ ). The mean difference between the psychosocial therapists and the physicians is significant ( $p = 0.041$ ). Consequently, hypotheses 1a and b are accepted.

The better the teamwork is perceived to be, the higher the job satisfaction. Interprofessional teamwork explains about 20% of this construct (see Table 3), whereas sociodemographic variables such as age group, gender, occupational group, job tenure and employment do not influence job satisfaction. Hypothesis 2 is thus also accepted.

## DISCUSSION

As expected, different healthcare professional groups vary significantly in their perception of interprofessional teamwork and job satisfaction. This result for Germany corresponds with the international literature on healthcare “professional silos” (Braithwaite, 2010; Delva et al., 2008; Hall, 2005; Margalit et al., 2009; Pecukonis et al., 2008; World Health Organization, 2010) or in-group identity as a barrier to effective interprofessional teamwork (Lloyd, Schneider, Scales, Bailey, & Jones, 2011; Sinclair et al., 2009). The physicians showed the highest values for interprofessional teamwork as well as for job satisfaction, which can be explained by the highest status and power of this profession in the healthcare system (Chang et al., 2009; Farrell, Schmitt, & Heinemann, 2001; Gair & Hartery, 2001). Traditionally, physicians are the team leaders and the decision-makers in hospitals (Chang et al., 2009), while the other professional groups struggle “to define their identity, values, sphere of practice and role in patient care” (Hall, 2005, p. 190). Nurses in particular strive for equal status in interprofessional teams (Büssing & Barkhausen, 1997) and are often separated from the rest of the team (Sinclair et al., 2009). These role discrepancies as well as the discipline-centred

organization of healthcare institutions are barriers for interprofessional teamwork (Chang et al., 2009; Körner, 2006).

Further, interprofessional teamwork is positively related to job satisfaction. Taking the input–process–output model (Lemieux-Charles & McGuire, 2006) as our starting point, and along with previous studies (Aiken et al., 2013; Chang et al., 2009; Kalisch et al., 2010; Körner, 2006), we expected an association between these two items. In the input–process–output models (Gladstein, 1984; Lemieux-Charles & McGuire, 2006; West, 2004), job satisfaction is categorized as an output criteria and teamwork as a process criteria. Additionally, teamwork is an important aspect of working conditions and, therefore, often a part of satisfaction assessments. Dimensions of teamwork, for example communication, cooperation and team climate, are sometimes also used to operationalize work conditions and job satisfaction (e.g. Büssing & Glaser, 2002; Farin et al., 2002; Hackman & Oldham, 1975). All these suggest a strong relationship between these two constructs, but the causality has not yet been clearly established.

Based on the association of teamwork and job satisfaction, we can assume that a more homogeneous perception of collaboration in the team (i.e. a shared mental model of interprofessional teamwork) is likely to increase team effectiveness (Burtscher, Kolbe, Wacker, & Manser, 2011; Lim & Klein, 2006). Team performance models emphasize the importance of sharing a mental model in teamwork (Salas, Sims, & Klein, 2004; Salas et al., 2005), and interprofessional education is recommended to establish a shared mental model in cross-sectional teams and to break down “professional silos” (Hall, 2005; Interprofessional Education Collaborative Expert Panel, 2011; World Health Organization, 2010). Interprofessional education and practice-based interventions for teams are not established in Germany by now (Körner, Bütof, Müller, Zimmermann, & Bengel, submitted; Reeves, Perrier, Goldman, Freeth, & Zwarenstein, 2013). However, there should be more support for this type of education and intervention, because there seems to be a great potential for enhancing effectiveness and efficiency of healthcare institutions in Germany.

## STUDY LIMITATIONS

The results are limited by some methodological issues. The study was cross-sectional with all measures conducted as self-reports. The IPS only assesses the perceived interprofessional teamwork, with no external evaluation such as team observations to collect behavioural data. The fact that we also used only one questionnaire to assess both constructs – interprofessional teamwork and job satisfaction – involves the risk of a common-method bias, limiting the validity of our findings. Longitudinal studies are needed to show that interprofessional teamwork is a determinant of satisfaction.

Although we covered 15 clinics in southwest Germany, there is a limitation to generalizability of the results for all in-patient medical rehabilitation clinics in Germany. In addition, the questionnaire return rate was low (42%); Bungard and Jöns (1997) evaluated return rates of up to 50% in staff surveys as acceptable. However, in





Table 2. Healthcare professionals' appraisals of interprofessional teamwork and job satisfaction.

Occupational group	Interprofessional teamwork			Job satisfaction		
	n	M	SD	n	M	SD
Physicians	49	3.19	0.56	49	4.16	0.85
Physical therapists	50	3.14	0.50	50	4.04	0.76
Nurses	43	2.80	0.58	48	3.83	0.86
Psychosocial therapists	65	2.79	0.40	67	3.72	0.81
<b>Total</b>	<b>207</b>	<b>2.97</b>	<b>0.54</b>	<b>214</b>	<b>3.92</b>	<b>0.83</b>

Table 3. Linear regression analysis to determine the relationship of interprofessional teamwork and job satisfaction (n=198).

Model	Predictors	Job satisfaction				
		B	SE <sub>B</sub>	$\beta$	$\Delta R^2$	R <sup>2</sup>
1	Teamwork (IPS)	0.670	0.098	0.439***	0.193	0.193
2	Teamwork (IPS)	0.648	0.109	0.425***	0.015	0.208
	Physicians	–	–	–		
	Nurses	-0.057	0.189	-0.029		
	Psychosocial therapists	-0.169	0.173	-0.095		
	Physical therapists	-0.098	0.170	-0.052		
	Age 17–25	–	–	–	–	
	Age 26–35	0.250	0.285	0.109		
	Age 36–45	0.280	0.278	0.158		
	Age 46–55	0.242	0.287	0.140		
	Age 56–65	0.174	0.319	0.074		
	Gender	-0.097	0.134	-0.059		
	Job tenure <sup>3)</sup>	-0.089	0.140	-0.049		
	Employment <sup>4)</sup>	-0.059	0.126	-0.034		
*** p < 0.001.						

## NOTE.

<sup>1)</sup> Healthcare professional groups are dummy coded (0/1).

<sup>2)</sup> Age groups are dummy coded (0/1).

<sup>3)</sup> Job tenure: dichotomized: 0 = job tenure ≤5 years and 1 = >5 years.

<sup>4)</sup> Employment: dichotomized: 0 = part time and 1 = full time.

comparison with other studies in this field our figure is acceptable. Previous experience depicts an average return rate for staff surveys in medical rehabilitation between 30% and 50% (Körner, 2010; Milch, Ernst, & Laubach, 1999). Since participation in the survey was voluntary, selection bias might have occurred. It can be assumed that we were only able to reach motivated clinics and staff. The staff in some clinics had serious doubts regarding the anonymity of the survey and/or feared consequences such as job loss. Moreover, we could not obtain general background data about the staff in the clinics (e.g. team

composition, gender and age) and are, therefore, not in a position to assess the representativeness of our sample. Besides the above-mentioned overlap of content of the two constructs, a response bias of the survey participants could also be the reason for the medium to high association. It can be assumed that participants fill in a questionnaire with the tendency of a sweeping statement (Borg, 2003; Bortz & Döring, 2002), which means that participants who like to complain do so throughout the entire questionnaire, whereas participants who are satisfied evaluate everything positively.

## CONCLUSIONS

On the basis of the results, we can conclude that there are barriers among different healthcare professionals in German rehabilitation clinics that hinder team work, as stated in the international literature (Braithwaite, 2010; Hall, 2005), and that these can influence job satisfaction. It can be assumed that breaking down healthcare professional silos (see e.g. Margalit et al., 2009; World Health Organization, 2010) could help to improve interprofessional teamwork as well as job satisfaction. Longitudinal intervention studies are needed to prove this assumption, as well as the association of interprofessional teamwork and job satisfaction with treatment outcomes and quality of care. However, the results of the study suggest that initiatives that establish a shared mental teamwork model (e.g. interprofessional education, team building and team development) to achieve a more homogeneous perception of teamwork will be able to improve teamwork and in turn job satisfaction.

## References

- Aiken, L. H., Sloane, D. M., Bruyneel, L., van den Heede, K., & Sermeus, W. (2013). Nurses' reports of working conditions and hospital quality of care in 12 countries in Europe. *International Journal of Nursing Studies*, 50(2), 143–153.
- Borg, I. (2003). *Führungsinstrument Mitarbeiterbefragung: Theorien, Tools und Praxiserfahrungen*. Göttingen: Hogrefe.
- Bortz, J., & Döring, N. (2002). *Forschungsmethoden und Evaluation für Human- und Sozialwissenschaftler*. Berlin: Springer.
- Braithwaite, J. (2010). Between-group behaviour in health care: gaps, edges, boundaries, disconnections, weak ties, spaces and holes. A systematic review. *BMC Health Services Research*, 10, 330. doi:10.1186/1472-6963-10-330
- Bungard, W., & Jöns, I. (1997). *Mitarbeiterbefragung: Ein Instrument des Innovations- und Qualitätsmanagements*. Weinheim: Psychologie Verlags Union.
- Burtscher, M. J., Kolbe, M., Wacker, J., & Manser, T. (2011). Interactions of team mental models and monitoring behaviors predict team performance in simulated anesthesia inductions. *Journal of experimental psychology*, 17(3), 257–269. doi:10.1037/a0025148
- Burtscher, M. J., & Manser, T. (2012). Team mental models and their potential to improve teamwork and safety: A review and implications for future research in healthcare. *Safety Science*, 50(5), 1344–1354. doi:10.1016/j.ssci.2011.12.033
- Büssing, A., & Barkhausen, M. (1997). Interdisziplinäre Zusammenarbeit und ganzheitliche Pflege. Eine systemorientierte Schnittstellenanalyse. In A. Büssing (Ed.), *Schriftenreihe Organisation und Medizin. Von der funktionalen zur ganzheitlichen Pflege. Reorganisation von Dienstleistungsprozessen im Krankenhaus* (pp. 163–192). Göttingen, Seattle: Verlag für Angewandte Psychologie.
- Büssing, A., & Glaser, J. (2002). *Das Tätigkeits- und Arbeitsanalyseverfahren für das Krankenhaus - Selbstbeobachtungsversion (TAA-KH-S)*. Schriftenreihe Organisation und Medizin. Göttingen [u.a.]: Hogrefe.
- Campion, M. A., Medsker, G. J., & Higgs, A. C. (1993). Relations between work group characteristics and effectiveness: Implications for designing effective work groups. *Personnel Psychology*, 46(4), 823–850. doi:10.1111/j.1744-6570.1993.tb01571.x
- Campion, M. A., Papper, E. M., & Medsker, G. J. (1996). Relations between work team characteristics and effectiveness: A replication and extension. *Personnel Psychology*, 49(2), 429–452. doi:10.1111/j.1744-6570.1996.tb01806.x
- Canadian Interprofessional Health Collaborative. (2010). A national interprofessional competency framework. Retrieved from [http://www.cihc.ca/files/CIHC\\_IPCompetencies\\_Feb1210.pdf](http://www.cihc.ca/files/CIHC_IPCompetencies_Feb1210.pdf)
- Cannon-Bowers, J. A., Salas, E., & Converse, S. (1993). Shared mental models in expert team decision making. In J. N. Castellan (Ed.), *Individual and group decision making: current issues* (pp. 221–266). Hillsdale: Lawrence Erlbaum Associates.
- Chang, W.-Y., Ma, J.-C., Chiu, H.-T., Lin, K.-C., & Lee, P.-H. (2009). Job satisfaction and perceptions of quality of patient care, collaboration and teamwork in acute care hospitals. *Journal of Advanced Nursing*, 65(9), 1946–1955. doi:10.1111/j.1365-2648.2009.05085.x
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences*. Hillsdale, NJ: Erlbaum.
- DeChurch, L. A., & Mesmer-Magnus, J. R. (2010a). The cognitive underpinnings of effective teamwork: A meta-analysis. *Journal of Applied Psychology*, 95(1), 32–53. doi:10.1037/a0017328
- DeChurch, L. A., & Mesmer-Magnus, J. R. (2010b). Measuring shared team mental models: A meta-analysis. *Group Dynamics: Theory, Research, and Practice*, 14(1), 1–14. doi:10.1037/a0017455
- Delva, D., Jamieson, M., & Lemieux, M. (2008). Team effectiveness in academic primary health care teams. *Journal of Interprofessional Care*, 22(6), 598–611. doi:10.1080/13561820802201819
- Farin, E., Meixner, K., Follert, P., Jäckel, W. H., & Jacob, A. (2002). Job satisfaction in rehabilitation clinics - development of the „MiZu-Reha“ questionnaire and its use in quality assurance [German]. *Rehabilitation*, 41(4), 258–267.
- Farin, E., Meixner, K., & Jäckel, W. (2013). *Fragebogen zur Mitarbeiterzufriedenheit in Rehabilitationskliniken - Version 2.0*. Retrieved from <http://www.uniklinik-freiburg.de/aqms/live/DLInstrumente/MiZuRehaVersion.pdf>

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- Farrell, M. P., Schmitt, M. H., & Heinemann, G. D. (2001). Informal roles and the stages of interdisciplinary team development. *Journal of Interprofessional Care, 15*(3), 281–295. doi:10.1080/13561820120068980
- Gair, G., & Hartery, T. (2001). Medical dominance in multidisciplinary teamwork: a case study of discharge decision-making in a geriatric assessment unit. *Journal of Nursing Management, 9*(1), 3–11.
- Gladstein, D. L. (1984). Groups in Context: A Model of Task Group Effectiveness. *Administrative Science Quarterly, 29*(4), 499–517.
- Hackman, J. R., & Oldham, G. R. (1975). Development of the Job Diagnostic Survey. *Journal of Applied Psychology, 60*(2), 159–170. doi:10.1037/h0076546
- Hall, P. (2005). Interprofessional teamwork: Professional cultures as barriers. *Journal of Interprofessional Care, 19*(Supplement 1), 188–196. doi:10.1080/13561820500081745
- Interprofessional Education Collaborative Expert Panel. (2011). Core competencies for interprofessional collaborative practice: Report of an expert panel. Retrieved from: <http://nmlm.gov/bhic/2011/05/26/core-competencies-interprofessional/>
- Kalisch, B. J., Hyunhwa L., & Rochman, M. (2010). Nursing staff teamwork and job satisfaction. *Journal of Nursing Management, 18*(8), 938–947. doi:10.1111/j.1365-2834.2010.01153.x
- Kazanjian, A., Green, C., Wong, J., & Reid, R. (2005). Effect of the hospital nursing environment on patient mortality: a systematic review. *Journal of Health Services Research & Policy, 10*(2), 111–117. doi:10.1097/01.NNA.0000312773.42352.d7
- Körner, M. (2006). Teamanalyse und Teamentwicklung in der medizinischen Rehabilitation. Dissertation. Rehabilitationswissenschaften, Rehabilitationspsychologie, Rehabilitationsmedizin: Vol. 12. Regensburg: Roderer.
- Körner, M. (2008). Analysis and development of multiprofessional teams in medical rehabilitation: Teamanalyse und Teamentwicklung in multiprofessionellen Teams in der medizinischen Rehabilitation. *GMS Psycho-Social-Medicine, 5*(Doc01). Retrieved from <http://www.egms.de/static/de/journals/psm/2008-5/psm000046.shtml>
- Körner, M. (2010). Interprofessional teamwork in medical rehabilitation: a comparison of multidisciplinary and interdisciplinary team approach. *Clinical Rehabilitation, 24*(8), 745–755. doi:10.1177/0269215510367538
- Körner, M., & Wirtz, M. A. (2013). Development and psychometric properties of a scale for measuring internal participation from a patient and health care professional perspective. *BMC Health Services Research, 13*(1), 374. doi:10.1186/1472-6963-13-374
- Körner, M., Bütof, S., Müller, C., Zimmermann, L. & Bengel, J. (submitted). Interprofessional teamwork in medical treatment of chronic diseases – a systematic review. *Disability and Rehabilitation*.
- Lemieux-Charles, L., & McGuire, W. L. (2006). What Do We Know about Health Care Team Effectiveness? A Review of the Literature. *Medical Care Research and Review, 63*(3), 263–300. doi:10.1177/1077558706287003
- Lim, B.-C., & Klein, K. J. (2006). Team Mental Models and Team Performance: A Field Study of the Effects of Team Mental Model Similarity and Accuracy. *Journal of Organizational Behavior, 27*(4), 403–418. doi:10.1002/job.387
- Lloyd, J., Schneider, J., Scales, K., Bailey, S., & Jones, R. (2011). Ingroup identity as an obstacle to effective multiprofessional and interprofessional teamwork: findings from an ethnographic study of healthcare assistants in dementia care. *Journal of Interprofessional Care, 25*(5), 345–351. doi:10.3109/13561820.2011.567381
- Locke, E. (1976). The nature and causes of job satisfaction. In M. Dunnette (Ed.), *Handbook of industrial and organizational psychology* (pp. 1297–1349). Chicago: Rand McNally.
- Margalit, R., Thompson, S., Visovsky, C., Geske, J., Collier, D., Birk, T., & Paulman, P. (2009). From professional silos to interprofessional education: campuswide focus on quality of care. *Quality Management in Health Care, 18*(3), 165–173. doi:10.1097/QMH.0b013e3181aea20d
- Mathieu, J. E., Heffner, T. S., Goodwin, G. F., Salas, E., & Cannon-Bowers, J. A. (2000). The influence of shared mental models on team process and performance. *Journal of Applied Psychology, 85*(2), 273–283. doi:10.1037/0021-9010.85.2.273
- Mickan, S. M., & Rodger, S. A. (2005). Effective Health Care Teams: A model of six characteristics developed from shared perceptions. *Journal of Interprofessional Care, 19*(4), 358–370. doi:10.1080/13561820500165142
- Milch, W., Ernst, R., & Laubach, W. (1999). Kooperation und Arbeitszufriedenheit im pflegerisch-ärztlichen Team: Eine Analyse pflegerischer Bewertungen in der Psychiatrie. *Psychiatrische Praxis, 26*(6), 122–127.
- Mohammed, S., Klimoski, R., & Rentsch, J. R. (2000). The measurement of team mental models: We have no shared schema. *Organizational Research Methods, 3*(2), 123–165. doi:10.1177/109442810032001
- O'Leary, K. J., Sehgal, N. L., Terrell, G., & Williams, M. V. (2012). Interdisciplinary teamwork in hospitals: A review and practical recommendations for improvement. *Journal of Hospital Medicine, 7*(1), 48–54. doi:10.1002/jhm.970
- Pecukonis, E., Doyle, O., & Bliss, D. L. (2008). Reducing barriers to interprofessional training: Promoting interprofessional cultural competence. *Journal of Interprofessional Care, 22*(4), 417–428. doi:10.1080/13561820802190442
- Petrie, H. G. (1976). Do You See What I See? The Epistemology of Interdisciplinary Inquiry. *Journal of Aesthetic Education, 10*(1), 29–43. doi:10.2307/3332007
- Reeves, S., Zwarenstein, M., Goldman, J., Barr, H., Freeth, D., Koppel, I., & Hammick, M. (2010). The effectiveness of interprofessional education: Key findings from a new systematic review. *Journal of Interprofessional Care, 24*(3), 230–241. doi:10.3109/13561820903163405
- Reeves, S., Perrier, L., Goldman, J., Freeth, D. & Zwarenstein, M. (2013). Interprofessional education: effects on professional practice and healthcare outcomes (update). *Cochrane Database of Systematic Reviews, Issue 3*. Art. No.: CD002213. doi:10.1002/14651858.CD002213.pub3
- Salas, E., Sims, D. E., & Burke, C. S. (2005). Is there a 'Big Five' in Teamwork? *Small Group Research, 36*(5), 555–599. doi:10.1177/1046496405277134
- Salas, E., Sims, D., & Klein, C. (2004). Cooperation and Teamwork at work. In C. D. Spielberger (Ed.), *Encyclopedia of applied psychology* (pp. 497–505). Oxford: Academic.
- Schaefer, J., & Davis, C. (2004). Case management and the chronic care model: a multidisciplinary role. *Lippincott's case management : managing the process of patient care, 9*(2), 96–103.
- Sinclair, L. B., Lingard, L. A., & Mohabeer, R. N. (2009). What's So Great About Rehabilitation Teams? An Ethnographic Study of Interprofessional Collaboration in a Rehabilitation Unit. *Archives of Physical Medicine and Rehabilitation, 90*(7), 1196–1201. doi:10.1016/j.apmr.2009.01.021
- Stock, R. D., Reece, D., & Cesario, L. (2004). Developing a Comprehensive Interdisciplinary Senior Healthcare Practice. *Journal of the American Geriatrics Society, 52*(12), 2128–2133.



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- Valentine, M. A., Nembhard, I. M., & Edmondson, A. C. (2013). Measuring Teamwork in Health Care Settings: A Review of Survey Instruments. *Medical Care*, 20. [Epub ahead of print] doi:10.1097/MLR.0b013e31827feef6
- Wagner, E. H. (1998). Chronic disease management: what will it take to improve care for chronic illness? *Effective Clinical Practice*, 1(1), 2-4.
- Wagner, E. H., Austin, B. T., Davis, C., Hindmarsh, M., Schaefer, J., & Bonomi, A. (2001). Improving chronic illness care: translating evidence into action. *Health Affairs*, 20(6), 64-78. doi:10.1089/acm.2005.11.s-7.
- West, M. A. (2004). *Effective teamwork: Practical lessons from organizational research* (2nd ed.). Malden, MA [u.a.]: BPS, British Psychological Society [u.a.].
- World Health Organization. (2010). *Framework for Action on Interprofessional Education & Collaborative Practice: Health Professions Networks Nursing & Midwifery, Human Resources for Health*. Retrieved from [http://whqlibdoc.who.int/hq/2010/WHO\\_HRH\\_HPN\\_10.3\\_eng.pdf](http://whqlibdoc.who.int/hq/2010/WHO_HRH_HPN_10.3_eng.pdf)