Analysis and development of multiprofessional teams in medical rehabilitation

Teamanalyse und Teamentwicklung in multiprofessionellen Teams in der medizinischen Rehabilitation

Abstract

Team analysis and team development are important instruments of organizational development and quality management. They contribute to team optimization in medical rehabilitation. Team analysis allows assessment of strengths and weaknesses of teams, resulting in possible recommendations for team development. So far there are only a few empirical studies and little practical experience analyzing multiprofessional teams in the health care field and inpatient medical rehabilitation in particular. This article presents team analyses performed on twelve multiprofessional medical rehabilitation teams in Germany and corresponding recommendations for team development.

A heuristic model of team analysis and team development was designed for this purpose. The model comprises the following parameters: input (team structure), process (teamwork) and output (team success). Variables to measure these parameters were derived from team performance models and known weaknesses of teams in medical care. Team analyses were conducted by administering a semi-standardized interview form and a short questionnaire to the head physicians of participating clinics while a survey was administered to all members of the rehabilitation team.

The results of the team analyses suggested the use of team development measures on each team. The teams were classified into three categories by their need for team development (low, medium and high). Furthermore five modules of team development could be generated from the results of the team analyses: (1) executive coaching, (2) communication training, (3) changing attitude towards teamwork, (4) taskoriented team development, and (5) training on socio-integrative aspects of teamwork. Some of these modules are important constituents of quality management programs. Team development can facilitate quality management programs, particularly with regard to process and output relating to leadership and staff. The study shows, that there is a basic, yet variable need of team analysis and team development in the medical rehabilitation facilities.

Keywords: team analysis, team development, medical rehabilitation

Zusammenfassung

Teamanalyse und Teamentwicklung sind wichtige Instrumente der Organisationsentwicklung und des Qualitätsmanagements. Sie tragen dazu bei, Teams in der medizinischen Rehabilitation zu optimieren. Mit Teamanalysen lassen sich Stärken und Schwächen der Teams messen und aus den Ergebnissen können Empfehlungen der Teamentwicklung abgeleitet werden. Bislang gibt es nur wenige empirische Studien und praktische Erfahrungen in der Analyse von multiprofessionellen Teams in der medizinischen Rehabilitation und der Gesundheitsversorgung. Der Artikel präsentiert Teamanalysen und Empfehlungen zur Teamentwicklung in zwölf multiprofessionellen Teams der medizinischen Reha-



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bilitation in Deutschland. Zunächst wird für diesen Zweck ein heuristisches Modell der Teamanalyse und Teamentwicklung konzipiert. Das Modell beinhaltet die Parameter "Input" (Teamstruktur), "Prozess" (Teamarbeit) und "Output" (Teamerfolg) sowie (Sub-)Variablen, um die Parameter zu messen, welche aus den Gruppeneffektivtätsmodellen und den bekannten Schwachstellen von Teams der medizinischen Versorgung abgeleitet wurden. Als Assessment wurde ein halbstandardisierter Interview-Leitfaden für Interviews mit den Chefärzten der Kliniken, ein Kurzfragebogen für die Klinikleitung und Mitarbeiterfragebogen für die Mitglieder der Rehabilitationsteams verwendet. Mittels der Teamanalysen konnten den Teams Empfehlungen zum Einsatz von Teamentwicklungsmaßnahmen gegeben werden. Die Teams können bezüglich des Bedarfs an Teamentwicklung in drei Kategorien (niedrig, mittel, hoch) eingeteilt werden. Zudem konnten aus den Ergebnissen der Teamanalysen der zwölf Teams fünf Module zur Teamentwicklung konzipiert werden: (1) Teamführung, (2) Kommunikationstraining, (3) Einstellungsänderungen bezüglich der Teamarbeit, (4) Verbesserung der sach-rationalen Aspekte der Teamarbeit und (5) Training der soziointegrativen Aspekte der Teamarbeit. Die Module sind teilweise Bestandteile von Qualitätsmanagementprogrammen. Teamentwicklung kann das Qualitätsmanagement insbesondere bezüglich der führungs- und mitarbeiterorientierten Prozesse und Ergebnisse unterstützen. Die Studie zeigt, dass grundsätzlich, wenn auch in unterschiedlichem Ausmaß, Bedarf an Teamanalysen und Teamentwicklung in den Einrichtungen der medizinischen Rehabilitation vorhanden ist.

Schlüsselwörter: Teamanalyse, Teamentwicklung, medizinische Rehabilitation

Introduction

Multiprofessional cooperation is considered an essential quality aspect for teams working in medical rehabilitation in Germany. Accreditation of a medical facility in the USA (by the Joint Commission on the Accreditation of Health Care Organization, JCAHO, for example) requires evidence of multiprofessional cooperation [1]. If there is not enough multiprofessional cooperation in the rehabilitation facility, it can result in competing priorities during therapy, unnecessary and/or duplicate clinical diagnostic examinations, time loss, absence of continuity, disregard of different care units, great expenses and uncertainty for the patient [2], [3], [4], [5]. Team analysis and team development can help to avoid these weaknesses in the process of rehabilitation. The Federal Consortium for Rehabilitation in Germany (German: Bundesarbeitsgemeinschaft für Rehabilitation, BAR) [6] recommends team development as one aspect of organizational development in order to assist quality management.

Recent analyses of teams in the health care field focus on single team parameters, such as hierarchy [7], task accomplishment [8], communication [9], [10], [11], [12] and staff satisfaction [13], [14]. Furthermore, the teams are monoprofessional in most instances, that is, nursing teams, teams of physicians [14], [15], [16]. Multiprofessional teams have only rarely been researched up until now [7], [17], [18]. There are two different team models (multi- and interdisciplinary) to be considered when describing how the members work together in teams:

- 1. A multidisciplinary team approach is discipline-oriented, each professional works in parallel, with clear role definitions, specified tasks and hierarchical lines of authority. The physician is responsible for inpatient treatment. He coordinates the treatment plans used by the other professionals. The level of professional autonomy is high, members create their own individual goals and treatment plans for the patient. The physician communicates with each of the other professionals, but there is little or no communication among the professionals. As a result there is little overlap between the team members. Only problem cases are discussed in team meetings.
- 2. Professionals in *interdisciplinary teams* meet regularly in order to discuss and collaboratively set treatment goals for the patients and jointly carry out the treatment plans. They are ideally on a par and there is a high level of communication and cooperation among the team members. The outcome of this model is that the professionals have skills across different disciplines. The interdisciplinary team model is considered to have a higher quality of collaboration and team performance [19], [20], [21], [22], [23]. Table 1 summarizes the differences between the multi- and interdisciplinary team models based on selected criteria.

Team development can contribute to change the multidisciplinary team model into an interdisciplinary team model [24], [25], [26]. Until now, empirical studies are



Criteria	Multidisciplinary Model	Interdisciplinary Model
Skills	related to a specific field	across-the-discipline
Responsibilities	physician	team
Management of treatment	hierarchical	coordinate
Frequency of team meetings	rare	regular
Discussion of patients	only the difficult patients (problem cases)	all patients
Communication and coordination	structure-related (and casual process-related)	process-related
Cooperation	bilateral (and here and there multilateral)	multilateral
Goals of patients	discipline-orientated	team-based
Discussion of treatment plans	minimal	permanent

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lacking which prove the assumption that interdisciplinary teams are superior to multidisciplinary teams [23]. Hibbert et al. [14] showed higher levels of satisfaction in a nursing team (monoprofessional team) when nurses work in interdisciplinary teams as opposed to multidisciplinary teams. But the difference is not statistically significant. Concerning teamwork and team success, the interdisciplinary teams reached consistently better results than the multidisciplinary teams in a pilot study by this author [27]. The differences between the multidisciplinary and interdisciplinary team models are also significant in this author's main study, but only for some variables of teamwork and team success (goal and structure orientation, information exchange between different disciplines, collaboration among colleagues, internal organization and communication, satisfaction in the team, different aspects of satisfaction) [28]. Besides these studies, only theoretical examinations of team models exist. Some authors defined models, reported case studies, and debated advantages and disadvantages [21], [22], [29], [30], while others described steps to transition from a multidisciplinary model to an interdisciplinary model [24], [25].

There are two recommendations for team development for rehabilitation clinics in Germany. Both are standardized and not adjusted to the requirements of the individual teams [6], [31]. Because of the lack of accredited standardized instruments, which use team analysis to deduce team development measures for the individual teams, this study seeks to develop theoretically and empirically substantiated assessment tools for team analysis in medical rehabilitation, in order to recommend measures for team development. In order to do so, a heuristic model of team analysis and team development was conceptualized and appropriate instruments were designed. The instruments developed this way were verified in a pilot study. Subsequently, the team analysis was performed and recommendations of team development measures were created and reported to the teams (survey feedback).

The heuristic model of team analysis and development was developed with the three dimension of quality (input, process and output) and team effectiveness models in mind. The parameters (team structure, teamwork, team success; see Figure 1) were operationalized based on the variables of team effectiveness models [32], [33], [34], [35] and empirically investigated deficits of teams in medical care. As a result of these studies, there is potential for improvement in the following areas regarding *team structure*:

- confused team size and constituency [18], [36]
- hierarchy, power, status problems [7], [37], [38], [39]
- heterogeneity [22], [40]
- lack of across-the-disciplines knowledge and skills [23]

The main problems of team process are:

- · the absence of common goals [41]
- role and/or task confusion [18], [42], [43]
- communication problems (different technical languages, not used possibilities of communication, selected transfer of information and information deficits [9], [11], [12], [24], [44]
- conflicts, the lack of coherence and counterproductive competition [45], [46]

The *team* success is particularly operationalized by productivity/performance and satisfaction [32], [33], [34]. Other criteria to measure team success would be length of stay [47], treatment outcome [48], or well being, stress and burnout [49], [50]. Furthermore, operating figures for team success could be drawn from employee turnover and absenteeism. However it is a true challenge to find proper and objective variables to assess the team success.

Team structure comprises team size and team consistency. These two variables depend on the focus of the different rehabilitation clinics. Physicians, nursing staff, therapists of the psychosocial department (such as psychotherapists, social workers, art-, work- and music-





Figure 1: Model of team analysis and development in medical rehabilitation

therapists), therapists of the physiological department (such as physiotherapists, masseur, sport-, exercise- and nutrition therapists, dieticians) constitute a team of medical rehabilitation. The two team models (multidisciplinary or interdisciplinary) essentially differ with respect to the "management of medical treatment" and "practice of communication and cooperation" [27].

The attitude toward work is an important – and possibly the most essential – prerequisite of teamwork [51]. Research in social psychology has shown that attitudes play an important role in anticipating behaviour (such as Ajzen and Fishbein's "Theory of Reasoned Action" research [52]). This suggests that the assumption that the attitude toward work in a team can help to predict team behaviour and satisfaction [53].

The main determinants of *team process* are communication, cooperation, task orientation and coherence.

The assessment of *team* success is based upon team performance, staff and patient satisfaction.

Methods

The present study is a cross-sectional study with a descriptive-explorative design on the basis of the model of team analysis and development in an inpatient medical rehabilitation setting. The goal is to recommend team development measures.

Questions

- What kinds of weaknesses will be found in teams in the inpatient medical rehabilitation setting?
- Can recommendations for team development be derived from the results of the team analyses?

Instruments

The data was collected by means of a phone interview, a survey of the team members and a short questionnaire for the medical head of the team/clinic. The **phone interview** determines the team model being used. The eleven criteria by Winter [23] were assessed and summarized in two main criteria: "organization and management" and "practice of communication and cooperation" (see Table 2).

After some open questions, the questions become increasingly more closed and the content of the two categories were finally read to the head physicians in order to decide conclusively for one category based on each criterion. If a team fulfilled criteria of multidisciplinarity in both of the categories ("organization and management" and "practice of communication and cooperation"), then it was clearly classified as a multidisciplinary team. If a team fulfilled criteria of interdisciplinarity in both of the categories, then it was clearly classified as an interdisciplinary team. However, teams could also be classified as using a "mixed model" if they simultaneously fulfilled criteria of multiand interdisciplinarity [27].

Team size and constellation, meeting structures, team model, employee turnover/absenteeism were measured with a **short questionnaire** for the head of medical department created by this author.

This short questionnaire for the head physicians, in addition to enabling assessment of the aforementioned team parameters, also allows verification of the reliability of the categorization of the teams' organizational models by means of the semi-standardized interview form. The closed questions used in the telephone interview to assess which model teams were using are also contained in identical form in the short questionnaire.



	Team Model Categories					
Criteria	Multidisciplinary	Interdisciplinary				
Management of Medical Treatment	The physician conducts a therapy plan and coordinates the therapists (hierarchically). Each professional group does their job in accordance with their standards (additive). The professionals work in parallel and independently of each other. Every therapist sets their own treatment goals for patients or receives them from the physician as a guideline.	The physician and other professionals works together in a team. There is a high level of cooperation, integration and participation. The treatment arrange- ments and decisions are collaboratively made by the team members. Treatment goals are also determined together as a team. They are obligatory for all team members. Modifications of the treatment goals or plans must discussed and decided in the team.				
Practice of Communication and Cooperation	Bilateral und occasionally multilateral: The physician and other therapists come to an agreement bilaterally. Multilateral team meetings/arrangements take place, especially for problem cases.	Permanent multilateral: All the professionals permanently work together as a team. Team meetings to discuss the treatment of all patients take place regularly. Communication is continuous and multilateral.				

Table 2: Descriptions of the criteria used in the half-standardised interview guideline to distinguish the two team models

Table 3: Assessment

Team parameter	Variables	Instruments				
Team structure	Team model	Semi-standardised interview guideline Short questionnaire for the clinical head				
	Team size and constellation Meeting structures	Short questionnaire for the clinical head				
	Attitude to team work	Staff questionnaire for the members of the team	Questionnaire on Individual Attitudes towards Teamwork (FIT) [53]			
Team process	Team work Communication	Staff questionnaire for the members of the team	Questionnaire on Teamwork (FAT) [55] Self-conceptualized global items Global Ratings (MiZu-Reha) [13]			
Team success	Staff Satisfaction Team performance	Staff questionnaire for the members of the team	Questionnaire on Staff Satisfaction in the Medical Rehabilitation [13]			
	Patient orientation and satisfaction		Self-conceptualized global items			

Explanatory note: The names of the German standardized surveys were translated by the author of the article.

The **staff questionnaire** for team members assayed teamwork, attitude about teamwork, communication, satisfaction and stress/strain. The data concerning monoand multiprofessional collaboration, communication, team satisfaction, team performance, team climate, patient orientation and patient satisfaction were collected with items determined by the author. The variables and instruments of the team analysis are displayed in Table 3. The instruments were partly tested for quality factors in a pilot study and modified for main study. The semistandardized interview manual proved to be reliable. The inter-rater-reliability (Cohens Kappa) averaged between .57 and 1.00. In spite of this, the form was modified in order to make the interview less redundant and the analysis of the data less complex and more transparent. The questionnaire packet for the team members contains an employee information sheet as well as a postage-paid



		Readiness to work in a team (BT)			
		High value	Low value		
Reservations about teamwork (VT)	High value	Concerned members	Critical team members		
	Low value	Open team members	Passive team members		

Table 4: Classification of team members according to Mohiyeddini [53]

return envelope. The employee information sheet states the objectives of the study and explicitly states that participation is anonymous and voluntary. Finally, the key components of the questionnaire packet are described: The Questionnaire on Teamwork (FAT [54], part of the staff questionnaire) can be universally employed, has been psychometrically validated, and allows a practically orientated and comprehensive description of cooperation in a team as well as the direct derivation of suggested courses of action to employ team development. It was first employed in the context of medical rehabilitation and was therefore assessed for suitability during the pilot study. The questionnaire consists of 24 items. The items are doubled-pole, such as "The objectives of the team are clear" versus "The objectives of the team are unclear". The scales refer on the one hand to person and on the other hand to structure. The scale on "structure orientation" (Reliability: Cronbach's Alpha in the pilot study .83) includes subscales "objective orientation" and "task accomplishment". Objective orientation focuses on the achievement of objectives. Therefore the objectives should be concrete and achievable. If the team works in an objective-oriented way, the probability of adequate "task accomplishment" will increase. The tasks and priorities have to be well-known in order to be effective. The scale on "person orientation" (Reliability: Cronbach's Alpha in the pilot study .89) is composed of subscales on "cohesion" and "willingness to accept responsibility". The subscale on "cohesion" measures confidence, social support and respect. One item is, for example, "There is no competition between the team members". "Willingness to accept responsibility" focuses commitment to the work, engagement and responsibility. The subscales build on each other. On the top of the pyramid is the "willingness to accept responsibility". If there are clear goals, task sharing and the team members accept and support each other, they feel responsible for the team output and their involvement is higher [55].

The two other questionnaires (FIT, MiZu-Reha) were not tested for quality factors in the pilot study, because they are already being applied in rehabilitation and medical settings [28].

The **Questionnaire on Individual Attitudes towards Teamwork** (FIT, [53]) allows classification into one of four types of teams as well as reliable and valid judgment of the suitability and readiness of individuals to work in teams. It consists of eight items on a Likert scale with 6 degrees from "does not apply at all" to "applies exactly". The FIT assesses two dimensions – "readiness to work in a team" (BT Scale) and "reservations about teamwork" (VT Scale) – each with four items. Team members can be classified into four types by median dichotomization and cross-classification (see Table 4).

Reliability (Cronbach's Alpha Coefficient) for the BT Scale was 0.74 and 0.84 for the VT Scale [53]. Validation studies show a positive effect of readiness for teamwork on satisfaction (correlation between BT Scale and the satisfaction questionnaire ZUF 8 by Schmidt, Lamprecht and Wittman [55] r=0.39, p<0.01). Also, reservations about teamwork were associated with lower satisfaction scores (correlation between VT Scale and ZUF 8: r=-0.30, p<0.05). A study in a hospital setting revealed that high scores on the Readiness to work in a team Scale are associated both with a positive estimation of the workplace atmosphere (r=0.039, p<0.01) and improved cooperation (r=0.28, p<0.05) [53].

The Questionnaire on Staff Satisfaction in the Medical Rehabilitation (MiZu-Reha) [13] is currently the only psychometrically validated questionnaire developed for co-worker satisfaction in the medical rehabilitation context. It consists of the following scales:

- Workplace atmosphere (7 items, such as "The workplace atmosphere is too impersonal"),
- Leadership (14 items, such as "My superior was often unfair with her/his staff", "My superior talked with her/his staff about their progress in performance")
- Organization and communication (10 items, such as "Many colleagues are either overstrained or unchallenged")

The scales are deployed using 31 items in bipolar sixdegree form. The MiZu-Reha scores are averaged and multiplied by a factor of two. To this end, the possible scores on the rating scale (one to six) are transformed to values of zero to five. The resulting averages range from zero to ten. Higher values reflect increased satisfaction. Standard deviations are small when the values of a clinic or professional group are homogenous.

In addition, the MiZu-Reha Questionnaire [13] also contains numerous individual items on specific topics which do not form scales but rather allow for descriptive analysis. The topic blocs include:

- Personal importance (11 five-level items)
- General job satisfaction (12 five-level items)
- Weak points (7 four-level items)

The MiZu-Reha scales were confirmed by factor analysis and show good to excellent reliability (Cronbach's Alpha: 0.86 to 0.95). The average resolution of items is satisfactory, with values of between 0.61 and 0.73. There is evidence of validity because the scales correlate highly (r=0.61 to 0.81) with the related but independent indicators for job satisfaction (individual items on general job



Team-ID	1	6	10	16	18
Focus of treatment	Respiratory Disease	Internal Medicine and Oncology	Neurology	Oncology	Rheumatology, Oncology, Pain
Number of beds	102	134	160	142	153
Rate of occupancy	65%	60%	118% ¹	85%	98%
Team size	26	19	85	48	42

Table 5: Description of the somatic rehabilitation clinics

¹ The clinic works with additional beds and in doing so, reaches a rate of occupancy of over 100%.

Team-ID 8 11 13 14 15 17 19 Focus of Mental health and psychosomatic Addiction Mental Addiction treatment diseases illnesses Number of bed 88 223 190 67 100 145 90 Rate of 90% 88% 93% 70% 99% 97% 89% occupancy Team size 38 35 65 69 33 38 58

Table 6: Description of the psychosomatic rehabilitation clinics

satisfaction). In contrast, the correlation with the non-related individual items is low (r=0.11 to r=0.54) [13].

Sample

In early 2003 we asked 87 cooperating partners at medical rehabilitation facilities who are members in the Freiburg-Bad Säckingen Rehabilitation Research Network if they were interested in participating in the study. Twelve medical rehabilitation teams (five somatic and seven psychosomatic rehabilitation clinics) took part in the study.

The five somatic rehabilitation clinics averaged 138 beds (SD=22.6). The rate of occupancy varied between 60% and 118%. The teams consisted on average of 44 team members (range=19-85, see Table 5). Consequently, there was one team member responsible for two to four beds. In the somatic rehabilitation clinics, there were two to three times as many women as men employed.

The psychosomatic rehabilitation clinics had an acceptance capacity of 129 beds on average (rate of occupancy=70%-99%). There were generally 48 members (range=33-69) in the team (see Table 6). The psychosomatic rehabilitation clinics were better staffed than the somatic clinics. There tended to be more women than men employed in the teams. Interestingly, the gender ratio is balanced in the rehabilitation clinics for addiction treatment (team 15 and 19). The proportion of team members compared to the acceptance capacity is better in the addiction treatment clinics than in other psychosomatic clinics.

For five teams (team 1, 11, 14, 15 and 19), the representativeness of the results is limited because they are missing one professional group each.

Data collection and analysis

First, a short questionnaire was distributed to the twelve head physicians of the rehabilitation clinics. Then, the head physicians of the rehabilitation clinics (n=12) were interviewed on the phone with the semi-standardized interview form. In addition, a survey of all team members of the twelve rehabilitation teams (n=556) was conducted. The response rate of the survey averaged between 28% and 64%.

The interviews were evaluated on a qualitative basis with a content analysis, whereas the data of the survey was evaluated with the Statistical Package for Social Science (SPSS Version 13). The data entry quality was tested by verification of random samples. Furthermore the items were checked for plausibility and missing data analysis was performed. Regarding the critical values, the recommendations of the instruments' authors were applied. When no such recommendation existed, cut-off values calculated in the pilot study were used and/or a comparative evaluation was performed.

Results

The study has detected a need for team development interventions in all the teams, but the results varied concerning the extent and manner of the respective measures (see Table 7).

Each team was categorized as a multidisciplinary, interdisciplinary or mixed-model team. Four teams (teams 1, 11, 14 and 17) are multidisciplinary teams. Executive coaching (module 1, see Table 8) and communication training (module 2, see Table 8) was recommended to them. This recommendation was based on their scores on the criteria used to categorize the teams ("organization



	Somatic rehabilitation clinics				linics	Psychosomatic rehabilitation clinics						
TEAM ID	1	6	10	16	18	8	11	13	14	15	17	19
Response rate in %	31	63	41	42	64	55	37	49	28	61	53	47
TEAM STRUCTURE												
team model	multi	mixed	inter	inter	mixed	mixed	multi	inter	multi	inter	multi	inter
team size	26	19	85	48	42	38	35	65	69	33	38	58
team types in %												
concerned team members	-	46	0	10	4	44	15	10	21	11	5	12
critical team members	50	9	49	30	36	28	31	32	26	26	31	31
open/direct team members	50	27	11	35	32	11	15	29	26	26	37	27
passive team members	-	18	6	25	28	17	39	29	26	37	26	31
			TEA	AM PF	ROCES	S						
FAT (means)		-	-	-	-		-	-	-			
Objective orientation	4.6	4.7	4.9	4.9	4.8	4.2	4.3	4.4	4.0	4.6	4.2	4.5
Task accomplishment	3.9	4.6	4.5	4.5	4.4	3.5	3.5	4.2	4.2	4.2	3.9	3.5
Cohesion	3.8	4.3	4.6	4.5	4.0	3.8	3.4	4.0	4.3	3.8	3.7	3.2
Willingness to accept responsibility	4.1	4.5	4.5	4.4	4.2	4.0	4.3	4.3	4.2	3.8	3.9	3.8
Social desirability	2.6	3.5	3.2	3.0	2.9	2.4	1.8	2.3	2.3	2.7	2.5	2.2
Global ratings (MiZu-Reha): Wea	ak point	s acco	ording	to coll	aborati	on and	l infor	matio	1 exch	ange	
with colleagues out of the own division	3.3	3.2	3.2	3.3	3.2	2.8	2.4	3.1	3.1	3.1	3.0	3.2
out of other divisions	2.1	2.5	2.5	2.5	2.6	2.7	2.5	2.7	2.3	2.5	2.8	2.1
with the direct boss	3.3	3.2	2.9	3.3	2.8	2.7	2.7	3.1	2.7	3.0	2.5	2.3
Global ratings (grades)												
Information exchange between different disciplines	3.8	3.0	2.8	3.2	3.0	2.9	2.9	3.1	3.4	3.2	2.9	3.8
Collaboration with the colleagues	1.9	2.1	1.9	1.8	2.3	2.2	2.2	2.0	2.4	2.1	2.1	2.1
Interdisciplinary collaboration	3	2.4	2.6	2.8	2.7	2.9	3	2.7	3.5	3	3	3.5
TEAM SUCCESS												
Global ratings (grades)												
Team performance	2.1	1.8	2.0	2.4	1.9	2.9	2.2	2.3	2.7	2.2	2.3	2.7
Team atmosphere	2.0	2.3	1.9	1.7	2.3	2.7	2.6	2.7	2.9	2.5	2.8	2.9
Team satisfaction	2.3	2.8	2.4	2.2	2.4	3.2	2.9	2.9	3.4	2.4	3.1	3.0
Patient orientation	1.5	1.6	2.1	1.9	1.9	2.8	2.2	2.2	2.6	2.3	2.2	2.6
Patient satisfaction	1.9	2.2	2.9	2.0	1.9	2.9	2.2	2.3	2.8	2.4	2.2	2.7
MiZu-Reha												
Working atmosphere	6.0	7.0	7.0	7.0	6.5	5.5	5.3	6.6	6.2	5.6	5.3	4.9
Organisation and communication	5.9	6.4	6.4	7.2	6.9	4.7	4.7	5.7	4.9	5.8	5.0	4.7
Leadership	7.1	6.8	6.9	6.6	6.3	5.7	5.6	6.4	6.2	5.6	5.3	5.1

Table 7: Results of team analysis

Shaded fields: The values are critical and indicate need for action (team development interventions)

- Team model: multi(discplinary), inter(disciplinary), mixed model

FAT: Subscale values less than 4 are critical. -

Team types: If there is a high number of team members with reservations towards teamwork and low readiness to work in the team, team development is needed.

Global rating of the team process items out of the MiZu-Reha: Values between 2 and 2.5 indicate high need for improvement and values above 2.5 indicate less demand for amelioration.

Grades: 1-6; Team process: score 3 and higher indicate potential for improvement. Team success grades of 2.8 and higher are critical. The cut-off points were determined via a ROC-analysis in the pilot study.

- MiZu-Reha: Scales of 1 to 10: Means below five are substandard.



Table 8: Description of the modules of team development

Module 1: Executive coaching
 learning management, managerial style, concept of leadership practicing team moderation studying team processes handling of different types of teams
Module 2: Communication training
 learning basics and theories of communication getting to know rules of conduct in a conversation observing and shifting of communication behavior analyzing of different languages/technical terminology finding in a common language (oriented on ICF-terminology)
Module 3: Changing attitudes towards teamwork
 reducing reservations towards teamwork improving the readiness for teamwork getting to know the other workplaces and work routines appreciating different ways of thinking, criteria for evaluation, strengths and weaknesses attending joint education and training on multi-/interprofessional topics joint visits to congresses and fairs conducting interdisciplinary projects, such as in the context of quality management
Module 4: Task-oriented team development
 clearly stating tasks, aims, roles in the team appointing priorities clearing, adjusting and negotiating responsibilities developing rules establishing work techniques and methods of problem-solving and decision-making learning strategies of management and conflict resolution
Module 5: Socio-integrative team development
 creating a climate of mutual confidence analyzing the processes in the team reflecting on the processes in the team enhancing social competency and skills

- organizing group dynamic activities (such as outdoor activities, celebrations, excursions)

and management" and "communication practice"). The mixed-model teams (teams 6 and 18) are advised "communication training" (module 2). Executive coaching (module 1) was recommended to team 8. All six teams (teams 1, 6, 11, 14, 17 and 18) to whom communication training was suggested showed negative values in the global items "exchange of information between different professionals or with other divisions". In addition, all the other teams except for team 8 show negative values in the global items and therefore they are advised to implement communication training (module 2), as well.

Most of the members of team 6 and 8 indicated reservations about teamwork. Thus they have to establish a readiness to work in teams and modify their attitude towards working in teams (module 3 in Table 8).

The values of the subscales of the FAT indicate that interventions to ameliorate team process are necessary in six teams (teams 1, 8, 11, 15, 17, 19). Task-oriented team development measures (module 4 in Table 8) as well as socio-integrative team development measures (module 5 in Table 8) were recommended to five of these teams. Team 15 needed only measures to improve the socio-integrative aspect of the teamwork.

Staff satisfaction showed poor results, especially among psychosomatic rehabilitation clinics. Furthermore, three teams exhibited a negative working atmosphere in their

team and low patient satisfaction (from the perspective of the employee). It is not possible to deduce special measures of team development in these cases, but team success should also improve with the improvement of team process, because there is a medium-to-high positive correlation (0.32-0.66) between these parameters.

The teams can be classified by the need for team development. There is a high need for team development among teams to which three or more modules of team development were recommended. This is the case for five of the teams (teams 1, 8, 11, 17 and 19). The other teams have only a low need. Three teams (teams 10, 13, and 16) require communication training only. The remaining four teams (teams 6, 14, 15, and 18) require two modules of team development measures. The recommendations of the team development measures are displayed in Table 9.

Modules 1 to 3 (see Table 8) should stand at the beginning of the team development process, since Comelli [56] considers these the prerequisite of any team development. Module 4 and 5 follows thereafter. This sequence does not have to be adhered to in every case. The teams can choose a different order; especially if team members consider one area more urgent than another. The sequence, as well as the content, of the team modules are

		-	-		-
	Module 1	Module 2	Module 3	Module 4	Module 5
Main focus of the modules	Executive coaching	Communication training	Changing attitudes towards teamwork	Task-oriented team development	Socio-integrative team development
Team 1	Х	Х	Х	Х	Х
Team 6		Х	Х		
Team 8	Х		Х	Х	Х
Team 10		Х			
Team 11	Х	Х		Х	Х
Team 13		Х			
Team 14	Х	Х			
Team 15		Х			Х
Team 16		Х			
Team 17	Х	Х			Х
Team 18		X		Х	
Team 19		Х		X	Х

Table 9: The recommendations of the team development modules

adapted to the respective problems of the team. The details of the modules are shown in Table 8.

The team leaders are recommended team leadership training, team moderation, team processes and the handling of different types of teams (module 1). Additional aims are finding an adequate managerial style for the individual personality of each leader and acquisition of cooperative leadership behaviour. The way of communicating is closely connected with the managerial style. There are many communication training programs commercially available. Therefore, the content of the communication training (module 2) is substantiated during the feedback process. Existing communication trainings give helpful suggestions and ideas in order to design a training adapted to the needs of each team. The Federal Consortium for Rehabilitation in Germany (BAR) [57] recommends a training to develop a common language within teams, which uses the terminology of the International Classification of Functioning, Disability and Health (ICF). However, this training unit does not exist yet.

The attitude toward teamwork determines the behaviour of team members as well as team action. The reservations about teamwork are to be reduced and the readiness to work in a team needs to be built up. Therefore, measures can include vocational trainings, project work, meetings in changing departments, workshops with different occupational groups (module 3). The aim is to get to know different workplaces and routines, appreciate the different way of thinking and skills and reduce the sceptical attitude to the other occupational groups, which often build up in the socialization process. Task-oriented and sociointegrative team development measures are recommended to improve the team process. The task-related team development measures (module 4) should be initiated first.

Discussion

This study has shown that team analyses are useful to identify weaknesses in team structure, team process and team success among rehabilitation teams. It seems clear that team analyses are key to team development, but there is only scarce information about how the analyses are conducted and the interventions are deduced from the results. This study developed a theory-based and practice-oriented assessment method to conduct team analysis in medical rehabilitation. The results of the study also confirmed that interdisciplinary teams achieve somewhat better process- and outcome scores than multidisciplinary teams. Literature suggested that multidisciplinary teams could be turned into interdisciplinary teams [24], [26]. However, there is no description as to how to determine which model a team uses and when team development measures are necessary. The present study recommends a modular approach to team development and contributes the following basic approaches. The interview form provides information about the need for team development, that is, executive coaching (module 1) and communication training (module 2). Both modules are possible approaches to turn a multidisciplinary team model into an interdisciplinary team model. The results of the FIT (Questionnaire on Individual Attitudes to Teamwork) [53] show whether there is a need to apply module 3 (Changing attitudes towards teamwork). Recommendations for task-related and socio-integrative team development measures (modules 4 and 5) concentrate on team process and are a result from the Questionnaire on Teamwork (FAT) [54].

It is mainly in the area of "management" and "communication" that the weak points are detected. Both are important criteria in quality management programs. For example, the IQMP-Reha (Integrated Quality Management Program for Rehabilitation) contains the criteria "leader-



ship/management", "staff" and "outcome related to staff". It can be assumed that these criteria could be optimized with the help of the modules for team development. This also supports the recommendation of the BAR [6], that team development should be used in concert with quality management.

Some limitations of this study should be noted. Based on quality management dimensions and team effectiveness models, team analysis is composed of team structure, -process and -outcome. The weak points of teamwork detected in previous studies (see above) are used to operationalize team structure process and team success. The results of this study crucially depend on these conceptual and methodical decisions, which were made in advance. That means, the conceptual framework does not include all the possible variables that could be employed to analyze teams.

This study is also limited by a small sample size. Fifteen out of 87 clinical teams of the Freiburg-Bad Säckingen Rehabilitation Research Network could be recruited. A lot of teams did not participate due to problems with occupancy, reorganization, dismissals, short employment contracts, departmental cutbacks, the shutting down of whole clinics and many more factors. It was often feared in this context that the problems in the clinics would be reflected by the results of the study.

The average return rate of 45%, however, is good for an employee attitude survey. The expected return rate was 30% to 50%. The response rates of the individual clinics in the study ranged between 28% to 64%. The head physician of each clinic was responsible for implementation and performance of the attitude survey. Therefore, the differences in the response rates (selection bias) could be caused by a different approach in the clinic setting. Furthermore, the management of those clinics with low response rates explained that there is a lack of personnel and material resources. Low return rates and high divergences between team and sample composition lead to restrictions regarding the generalizability of the results. Bias due to non-responders can be anticipated. It was established that there is an absence of whole professional groups in five of the twelve teams (team 1, 11, 14, 15, 19). In these cases, the sample compositions are not representative of the real team compositions. The reasons why whole professional groups did not answer should be investigated. It is assumed that response rates depend on the approach used to distribute the staff questionnaires and motivate the staff to complete the questionnaires in the clinical facilities.

This study encourages team optimization using team analysis and team development in addition to quality management in medical rehabilitation. There are two approaches to team development established in Germany thus far, but there is little [31] or no [6] information available about the effects of the interventions in medical rehabilitation until now.

The modular concept used in this study creates the precondition for need-oriented team development. It will be necessary to evaluate the concept of modular team development in future studies. The effectiveness of the developed modules should be substantiated with respect to the three separate aspects of teams (structure, process and/or success). In general, team development interventions are effective, but further studies are required to prove this.

Notes

Conflicts of interest

None declared.

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Please cite as

Körner M. Analysis and development of multiprofessional teams in medical rehabilitation. GMS Psychosoc Med. 2008;5:Doc01.

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http://www.egms.de/en/journals/psm/2008-5/psm000046.shtml

Published: 2008-03-03

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