Research article

Patient autonomy in cardiac inpatient rehabilitation—A COVID-19-specific exploratory trend study

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A B S T R A C T

Background: The COVID-19 outbreak has changed nearly all societal domains, including medical rehabilitation. Social distancing measures impacted patients as well as health professionals during the rehabilitation process. Enhancing patient participation should not be forgotten during exceptional situations, as restrictive measures are related to the self-determination of patients.
Aim: In this exploratory trend study, we aimed to examine the association between COVID-19 restrictions with patients' motivation, their perception of the patient-provider-relationship, their participation in the rehabilitation process and their current state of health at the beginning of their rehabilitation.
Methods: Adopting an exploratory approach, we compared data from a convenience sample of two different groups of patients, who stayed at a cardiac rehabilitation clinic at two different time periods: before the COVID-19 lockdown of rehabilitation clinics (n = 128) and after reopening during the COVID-19 period (n = 137). We used questionnaires on motivation for rehabilitation, patient-provider-relationship, patient activation and perceived state of health. We conducted t-tests and regression analysis to determine whether there were differences by gender, age, heart failure status, preferred form of decision-making (shared/not-shared) and time of rehabilitation (before/during COVID-19) related to the outcome variables.
Results: Participants evaluated the quality of the patient-provider-relationship in a better way after the reopening of the rehabilitation clinics during the COVID-19 period ($p < 0.05$), their motivation, participation in the rehabilitation process and their current state of health at the beginning of their rehabilitation was comparable to the group before the COVID-19 lockdown of rehabilitation clinics. Differences in scepticism concerning the treatment and the quality of the patient-provider-relationship were related ($p < 0.05$) to age and the preferred form of decision-making. Differences in active participation were related ($p < 0.05$) to sex and differences in the perceived state of health ($p < 0.05$) to a heart failure diagnosis.
Conclusions: Treatment providers could use the time patients spend in isolation after arrival to prepare them for virtual goal-setting conversations to enhance patient participation in exceptional situations.

1. Introduction

Goal setting is becoming increasingly important in view of the promotion of participation in professional and social life in medical rehabilitation. Therefore, active participation of rehabilitation participants is more and more postulated (Cardol et al., 2002; Gandjour, 2014; Pohontsch et al., 2011) so that patients are able to provide personal information relevant for one's treatment to their doctor or therapist. Overall, patients' active participation in health care is now considered a reliable indicator of their willingness and ability to manage their own health in a self-determined way (Greene et al., 2015; Hibbard, 2003).

We understand self-determination or patient autonomy in medical rehabilitation as making one's own decision concerning one's own rehabilitation treatment (Senin and Meyer, 2019), due to the effects of rehabilitation treatment on the lifestyle of patients (Cardol et al., 2002). Although it has become an essential part of healthcare and especially rehabilitation (Chan, 2002; Gandjour, 2014; Pohontsch et al., 2011; Welti, 2008), it is quite critically discussed at the same time (Geisler,

2004). Influencing factors such as socio-legal aspects or the individual background (e.g. social environment, resources) need to be taken into account (Senin and Meyer, 2019). Furthermore, rising expectations of patients, an increasing number of possible treatment strategies and ethical and legal deliberations lead to increasing importance of patient participation (Simon et al., 2008), which is more and more demanded in medical rehabilitation (Cardol et al., 2002). Results in the outpatient field highlight the importance of active patient participation to improve treatment outcomes (Greene and Hibbard, 2012; Hibbard et al., 2015). Therefore, enhancing patient participation, for example in form of shared decision-making, should not be forgotten during COVID-19 pandemic (Köther et al., 2021; Simpson et al., 2020), as restrictive measures are related to the relationship between patients and health professionals but also provide opportunities to foster a patient-centred approach (Abrams et al., 2020).

The COVID-19 outbreak has changed all societal domains, including health care services. The abrupt challenge for healthcare providers to manage a rise of COVID-19 cases and maintain essential healthcare services placed a heavy strain on healthcare professionals and also patients (Webb et al., 2021). On the one hand, the limitation of self-determination because of diagnostic testing has been condoned (Ruhnke, 2021). On the other hand, maintaining patient autonomy in the times of a pandemic was critically discussed, especially for pregnant and delivering women and also their infants (Boscia, 2020; Haiek et al., 2021; Kantrowitz-Gordon, 2020; Linden and Maimburg, 2020; Minkoff and Ecker, 2021; Romanis and Nelson, 2020; Zipursky et al., 2021), but also for other groups of patients like those with nasal allergies (Winders et al., 2021), older people (Dhand et al., 2021; Kaelen et al., 2021) and children (Patel et al., 2021). As in other areas, policy makers forced system adaptations in the field of medical rehabilitation to contain the new coronavirus spread, especially social distancing measures. In addition to measures such as general minimum distance, protective masks, reduction of physical contact, and mandatory testing, decision makers defined further forms of social distancing in medical rehabilitation: isolation on the first day until a test result is available, no visitors during the whole stay, but also telemedical conversations and video lectures (Pensionsversicherungsanstalt, 2020). However, to the best of our knowledge, there is no empirical evidence on how the COVID-19 pandemic and the specific restrictive measures are related to patients' active participation in the rehabilitation process.

1.1. Theory

The changing role of patients towards an active counterpart leads to an increasing importance of self-determination in medical rehabilitation (Bundesarbeitsgemeinschaft für Rehabilitation, 2016). The model of self-determination in medical rehabilitation describes self-determination in different manifestations from largely to absent and names influencing internal factors on the level of patients (for example motivation) and external factors on the level of the rehabilitation facility (for example attitude and behaviour of health professionals). The interactions within and between these influencing factors can also be used to positively influence patients (Senin and Meyer, 2019).

According to previous research results, both the motivation of patients and the quality of the relationship they perceive in their interaction with health professionals are connected with the participation behaviour of patients (Dibbelt et al., 2010; Smith et al., 1995), but, to the best of our knowledge, have not yet been investigated in the context of medical rehabilitation and not in the context of COVID-19-related issues. Based on these results of previous research, assumptions about causal relationships can be derived following the model of self-determination in medical rehabilitation. The patient motivation could be determined by their willingness to engage in lifestyle modification and by their attitude toward the

rehabilitation treatment and could have a significant relation to their participation and communication behaviour. Similarly, how health professionals engage patients in the treatment process could be related to their patient participation. Findings from the field suggest (Greene et al., 2015; Hibbard et al., 2015) that active patient participation in treatment decisions could subsequently be related to the success of medical rehabilitation.

To involve patients in treatment decisions, such as deciding on their rehabilitation goals, the method of shared decision making (SDM) was defined (Charles et al., 1997). In contrast to the paternalistic model the method of SDM involves the preferences of the patient. In the paternalistic model the patient takes over a largely passive role in terms of compliance with the medically prescribed therapy and the treatment decision is made by the doctor on the basis of his or her own professional expertise. In the method of SDM, the doctor provides health-related information and the patient reports on his or her personal life situation. In contrast to the information model for decision-making the decision is made jointly by both sides in the method of SDM. In the information model the patient decides on his or her own based on the information provided about treatment (Simon et al., 2008).

In 2009, the model of SDM (Charles et al., 1997) was extended specifically for medical rehabilitation to include the interaction of patients with professional groups other than doctors (external orientation) as well as the interactions between the different health professions within the rehabilitation team (internal orientation). Accordingly, health professionals gather information in the form of conversations and diagnostic procedures in consultation with the patient in the first step. Then, the treatment decision is jointly prepared in the rehabilitation team, e.g. in a team meeting, to finally support the actual decision made in personal discussions between professionals and the patient (Körner, 2009).

In practice, information related to personal rehabilitation goals could be gathered through a goal-setting questionnaire issued before the arrival of the patient as well as through a goal-setting dialogue with the patient after the arrival (Buchholz and Kohlmann, 2013). In case of ambiguity, decisions on rehabilitation goals could be coordinated and prepared with especially trained health professionals, comparable to the patient management in medical rehabilitation in Switzerland. It was established to ensure that personal goals of the patients are systematically addressed, e.g. via an interdisciplinary progress protocol and rehabilitation team meetings (Stange et al., 2014). Subsequently, the actual agreement on goals can be seen as a step in the decision-making process. This can take place in consultation between the health professionals and the patient, in which, for example, it is discussed whether the goals for the targeted period are realistic. In addition, concretisation of the objectives with other health professionals can be seen as part of the decision-making process. Furthermore, the measurability of goals could also be addressed (Glattacker et al., 2015).

2. Methods

2.1. Study design and participants

The main purpose of this trend study was the impact of COVID-19 restrictions (i.e., isolation on the first day until a test result is available, no visitors during the whole stay etc.) on patients' motivation, their perception of the patient-provider-relationship, their participation in the rehabilitation process and their current state of health at the beginning of their rehabilitation. Adopting an exploratory approach, we compared data from a convenience sample of two different groups of patients, who stayed at a cardiac rehabilitation clinic at two different time periods: (1) before the COVID-19 lockdown of rehabilitation clinics and (2) after reopening during the COVID-19 period. Study participants had to be of age and to show sufficient German language skills and cognitive abilities. In total, the sample contained 265 patients: 128 before and 137 during COVID-19.

2.2. Data collection and measurements

Data collection took place from December 2019 until March 2020 (before the COVID-19 lockdown) and from August until November 2020 (after reopening of rehabilitation clinics) in the same cardiac rehabilitation clinic. The study was approved by Ethics Committee of Lower Austria (application no. GS1-EK-4/625–2020). Additional to written and oral information, study participants were recruited by active reference of medical staff members at the beginning of their stay at the rehabilitation clinic. Informed consent was obtained from the participants. Data was collected consecutively until the target sample size of 120 participants in each group was reached.

The primary endpoints of the self-reported survey were the following behavioural and health domains: patient motivation, patient-doctor-relationship, patient activation and subjective health state. Specifically, we used the dimensions scepticism (PAREMO-SC) and willingness to change (PAREMO-WC) of the patient questionnaire to record rehab motivation (PAREMO). Each of the two dimensions consists of three items on a four-point Likert scale ranging from disagree to agree. High sum scores in PAREMO-WC indicate a high level, whereas high scores in PAREMO-SC indicate a low level of motivation (Thies et al., 2008). The patient-doctor-relationship was measured using the patient reaction assessment (PRA). It consists of 15 items on a seven-point Likert-scale ranging from strongly disagree to strongly agree operationalising the dimensions information, communication, and affectivity. Sum scores vary between 15 and 105, in which higher scores represent a higher level of perceived quality of the patient-doctor-relationship (Brenk-Franz et al., 2016). Patient activation was operationalized using the German version of the patient activation measurement (PAM). This 13-item self-reported scale measures self-assessed knowledge about chronic conditions, beliefs about illness and medical care, and self-efficacy for self-management and is quantified by a sum score ranging from 13 to 52[1] (Brenk-Franz et al., 2016). To assess patients' current subjective state of health, we used the visual analogue scale (EQ5D-VAS) in the form of one item ranging between 0 and 100, which is a part of the EuroQol questionnaire.

2.3. Statistical analysis

Data analysis was conducted by using SPSS Version 24 in three steps. In the first step, we conducted descriptive analyses with reference to socio-demographic characteristics. In a second step, differences on outcome variables concerning gender, age, heart failure status and preferred form of decision-making (shared/not-shared) were analysed by conducting t-tests. Additionally, we used regression analysis to analyse the relationship between age and patient-doctor-relationship in more detail. In the last step, we performed further t-tests to determine whether there were differences by time of rehabilitation (before/during COVID-19) related to the outcome variables.

3. Results

3.1. Study sample

Data from N = 265 patients with an average age of 62 years (+/−10.9) were included in the analysis. A total of 192 men (72.5%) and 63 women (23.8%) were part of the sample (n.a.: n = 10; 3.8%). Most patients were already retired at the time of the survey (n = 127; 47.9%) and living in a partnership (n = 202; 76.2%). More than half of the participants (n = 144; 54.3%) had already experienced a treatment

at a rehabilitation clinic before the current stay. More than two thirds of the employed persons stated that they wanted to return to work immediately after completing rehabilitation. The limitations due to the cardiovascular disease were perceived differently by the patients (very strong 5.3%; strong 21.1%; moderate 38.1%; slight 24.2%; none at all 8.3%). A total of 115 individuals (43.4%) suffered from heart failure. Ninety-two patients (34.7%) reported stronger limitations because of another condition. One-third (n = 91; 34.3%) preferred shared-decision making regarding treatment. 128 patients (48.3%) stayed at the rehabilitation clinic before the COVID-19 lockdown of rehabilitation clinics, 137 (51.7%) during COVID-19. Table 1 lists sociodemographic and treatment-relevant data.

3.2. Association with sociodemographic and treatment-relevant characteristics

T-tests were performed to determine whether there were significant differences by gender, age (under 65 or 65 and older), heart failure status and preferred form of decision-making (SDM or other) related to the outcome variables PAREMO-SC, PAREMO-WC, PRA, PAM and EQ5D-VAS. PAREMO-SC and PRA were related to age and the preferred form of decision-making. Sex had only a significant relation to PAM, as heart failure status on EQ5D-VAS. Sociodemographic and treatment-relevant characteristics had no association with PAREMO-WC. Results may be found in Table 2.

Concerning the highly significant association between age and PRA (p = 0.000), we performed a simple regression analysis on these two variables. Results (F (1, 227) = 20.797, p < .001) explain 8.0% of the variance in doctor-patient relationship quality by age, which corresponds to a medium effect (f = 0.295) (Cohen, 1992). The corresponding scatterplot can be seen in Figure 1.

3.3. Association with COVID-19 restrictions

Further t-tests were used to analyse the relation of time of rehabilitation (before/during COVID-19) on the outcome variables PAREMO-SC, PAREMO-WC, PRA, PAM and EQ5D-VAS. In fact, time of rehabilitation had no association with PAREMO-SC, PAREMO-WC, PAM and EQ5D-VAS, while it had a significant relation to PRA. In particular, patients, who stayed at a cardiac rehabilitation clinic during the time period of COVID-19, reported a higher level of patient-doctor-relationship. Results may be found in Table 3 and in Figure 2.

We also analysed the sociodemographic and treatment-relevant characteristics before the COVID-19 lockdown of rehabilitation clinics and after reopening during the COVID-19 period in detail. Before the COVID-19 lockdown of rehabilitation clinics PAREMO-SC and PRA were related to age. Heart failure status had a significant relation to PAM and EQ5D-VAS. Results may be found in Table 4.

After reopening during the COVID-19 period, PRA was related to age and the preferred form of decision-making. Heart failure status had a significant association with EQ5D-VAS. Results may be found in Table 5.

4. Discussion

The main purpose of this study was to examine the association between COVID-19 restrictions (i.e., isolation on the first day until a test result is available, no visitors during the whole stay etc.) and patients' motivation, their perception of the patient-provider-relationship, their participation in the rehabilitation process and their current state of health at the beginning of their rehabilitation among a convenience sample of Austrian adults. COVID-19 has forced policy makers to enforce public health measures needed for pandemic containment and allow optimal allocation of health care resources and challenged health care providers to reconceptualize quality of health care (Shaker et al., 2020). Especially in times of stricter guidelines, the active participation of patients regarding treatment options should be encouraged and demanded

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[1] We used the items from the logit metric and did not transform it to a standardized metric ranging from 0 to 100 (0 = lowest activation level, 100 = highest activation) to use the cut-off points suggested in the test manual to categorize patients into four levels of activation.

Table 1. Summary of sample characteristics.

variables	values
age (in years)	M = 61.69; SD = 10.94
sex	
male	72.5%
female	23.8%
missing	3.8%
state of employment	
blue-collar worker	9.4%
white-collar worker	25.3%
self-employment	2.3%
civil worker	6,8%
Unemployed	4.5%
Retired	47.9%
temporary retired	0.4%
Other	0.8%
missing	2.6%
family status	
single	6.0%
married	66.8%
other partnership	9.4%
divorced	8.3%
widowed	6.0%
missing	3.4%
rehabilitation experience	
yes	54.3%
no	43.0%
missing	2.6%
X. rehabilitation stay	
1st time	41.9%
2nd time	33.6%
3rd time	10.6%
4th time	3.4%
5th time	3.0%
6th time	1.5%
more than 6 times	1.2%
missing	1.9%
planned return-to-work	
immediately after rehabilitation	32.5%
within one month	6.8%
within three months	2.3%
within six months	1.1%
not at all	0.8%
not applicable	47.5%
missing	6.0%
limitations due to cardiovascular disease	
very strong	5.3%
strong	21.1%
moderate	38.1%
slight	24.2%
none at all	8.3%
missing	3.0%
heart failure	
yes	43.4%
no	52.8%
missing	3.8%
limitations due to other disease	
yes	43.7%
No	61.5%
Missing	3.8%

Table 1 (*continued*)

variables	values
preferred form of decision-making	
patient decision with reference to doctor's opinion	15.1%
doctor decides with reference to patient's opinion	27.2%
shared decision	34.3%
doctor decides	5.3%
patient decides	1.9%

Table 2. Psychometric variables for socio-demographic and treatment-relevant factors.

| mean (+/-SD)	male	female	p-value
PAREMO-SC	5.14 (3.397)	4.89 (2.057)	0.582
PAREMO-WC	9.10 (1.987)	8.88 (2.263)	0.486
PRA	63.10 (10.430)	65.96 (12.230)	0.101
PAM	42.86 (5.328)	44.55 (4.598)	0.035
EQ5D-VAS	69.73 (16.768)	70.54 (15.381)	0.746
mean (+/−SD)	**under 65**	**65 and older**	**p-value**
PAREMO-SC	4.69 (1.792)	5.79 (4.561)	0.008
PAREMO-WC	9.01 2.143)	9.08 (1.943)	0.792
PRA	61.35 (9.476)	68.68 (12.101)	<0.001
PAM	42.83 (4.915)	44.07 (5.659)	0.082
EQ5D-VAS	70.99 (16.681)	68.11 (15.956)	0.200
mean (+/−SD)	**heart failure**	**no heart failure**	**p-value**
PAREMO-SC	5.06 (1.905)	5.00 (3.815)	0.875
PAREMO-WC	9.20 (2.117)	8.97 (2.014)	0.391
PRA	64.36 (11.889)	63.65 (9.953)	0.621
PAM	42.63 (5.413)	43.74 (4.863)	0.097
EQ5D-VAS	63.07 (17.235)	75.53 (13.542)	<0.001
mean (+/−SD)	**SDM**	**other**	**p-value**
PAREMO-SC	4.64 (1.704)	5.53 (2.435)	0.040
PAREMO-WC	8.79 (2.051)	9.67 (2.000)	0.085
PRA	62.15 (10.176)	68.29 (9.245)	0.017
PAM	42.94 (5.199)	42.41 (4.770)	0.688
EQ5D-VAS	70.67 (15.813)	68.76 (19.360)	0.641
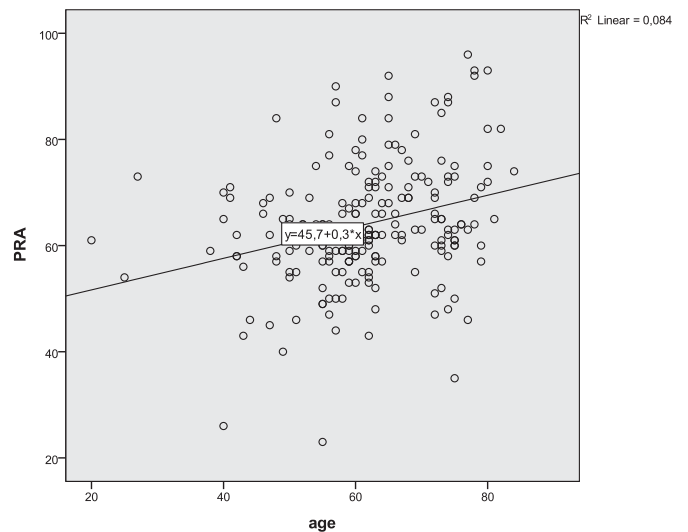
Figure 1. Relation between quality of doctor-patient relationship and age.

Table 3. Psychometric variables for time of rehabilitation.

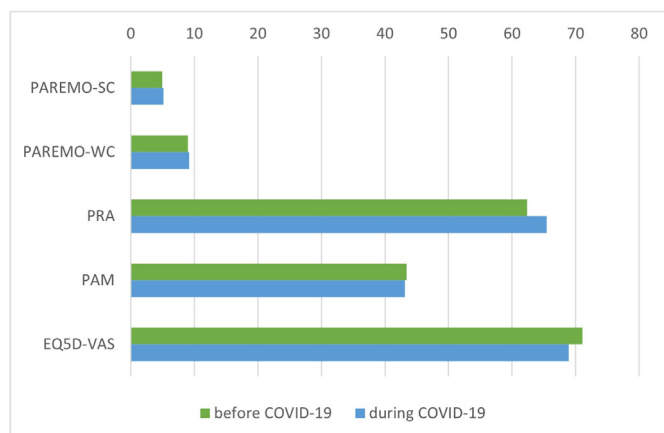| mean (+/-SD)	before COVID-19	during COVID-19	p-value
PAREMO-SC	4.94 (1.860)	5.12 (3.873)	0.649
PAREMO-WC	8.96 (2.086)	9.19 (2.035)	0.374
PRA	62.39 (10.042)	65.46 (11.462)	0.027
PAM	43.37 (5.283)	43.11 (5.033)	0.694
EQ5D-VAS	71.06 (16.848)	68.93 (15.882)	0.314

Figure 2. Psychometric variables for time of rehabilitation.

Table 4. Psychometric variables for socio-demographic and treatment-relevant factors before the COVID-19 lockdown of rehabilitation clinics.

mean (+/−SD)	Male	female	p-value
PAREMO-SC	5.05 (1.854)	4.73 (1.951)	0.455
PAREMO-WC	9.06 (2.042)	8.42 (2.120)	0.177
PRA	61.88 (9.740)	63.96 (11.216)	0.404
PAM	42.92 (5.371)	44.92 (5.055)	0.098
EQ5D-VAS	69.92 (17.77)	75.16 (13.425)	0.116
mean (+/−SD)	**under 65**	**65 and older**	**p-value**
PAREMO-SC	4.61 (1.675)	5.82 (2.012)	0.002
PAREMO-WC	9.06 (2.096)	8.67 (2.056)	0.330
PRA	60.31 (8.574)	66.38 (11.908)	0.008
PAM	42.92 (5.207)	44.05 (5.643)	0.301
EQ5D-VAS	71.01 (18.637)	71.11 (13.407)	0.975
mean (+/−SD)	**heart failure**	**no heart failure**	**p-value**
PAREMO-SC	5.23 (1.711)	4.66 (1.957)	0.094
PAREMO-WC	9.07 (2.118)	8.87 (2.093)	0.605
PRA	62.38 (10.608)	62.64 (9.597)	0.890
PAM	42.30 (5.645)	44.51 (4.777)	0.028
EQ5D-VAS	63.32 (18.238)	78.65 (11.751)	<0.001
mean (+/−SD)	**SDM**	**other**	**p-value**
PAREMO-SC	4.69 (1.767)	5.50 (1.604)	0.210
PAREMO-WC	8.78 (2.123)	10.13 (1.885)	0.088
PRA	60.84 (9.040)	66.75 (11.107)	0.182
PAM	43.02 (5.349)	43.14 (3.891)	0.940
EQ5D-VAS	71.45 (15.289)	70.29 (27.244)	0.855

Table 5. Psychometric variables for socio-demographic and treatment-relevant factors after reopening during the COVID-19 period.

mean (+/−SD)	male	female	p-value
PAREMO-SC	5.22 (4.415)	5.00 (2.151)	0.703
PAREMO-WC	9.13 (1.941)	9.24 (2.336)	0.794
PRA	64.50 (10.975)	67.69 (12.987)	0.240
PAM	42.79 (5.314)	44.26 (4.274)	0.127
EQ5D-VAS	69.55 (15.933)	66.94 (16.038)	0.429
mean (+/−SD)	**under 65**	**65 and older**	**p-value**
PAREMO-SC	4.77 (1.912)	5.76 (5.799)	0.240
PAREMO-WC	8.95 (2.202)	9.41 (1.802)	0.204
PRA	62.43 (10.278)	70.71 (12.043)	<0.001
PAM	42.74 (4.634)	44.09 (5.736)	0.187
EQ5D-VAS	70.96 (14.498)	65.85 (17.425)	0.096
mean (+/−SD)	**heart failure**	**no heart failure**	**p-value**
PAREMO-SC	4.89 (2.086)	5.27 (4.788)	0.538
PAREMO-WC	9.33 (2.128)	9.05 (1.959)	0.443
PRA	66.57 (12.931)	64.47 (10.224)	0.341
PAM	42.96 (5.196)	43.10 (4.874)	0.884
EQ5D-VAS	62.80 (16.262)	73.12 (14.394)	<0.001
mean (+/−SD)	**SDM**	**other**	**p-value**
PAREMO-SC	4.60 (1.649)	5.55 (2.979)	0.102
PAREMO-WC	8.81 (1.989)	9.30 (2.111)	0.498
PRA	63.44 (11.084)	69.67 (7.649)	0.046
PAM	42.85 (5.072)	41.90 (5.446)	0.607
EQ5D-VAS	69.89 (16.356)	67.70 (12.979)	0.630

(Abrams et al., 2020). On this basis, the main objective was to contribute to the debate of factors influencing patient autonomy and especially, how restrictive measures are associated with the relationship between patients and their healthcare providers. Our results show that the patient-provider-relationship was perceived differently by a sample of patients recruited in inpatient cardiac rehabilitation. Patients, who stayed at the rehabilitation clinic during the COVID-19 pandemic, evaluated their reference health professional more open to dialogue and supportive than those, who stayed there before the pandemic. This could be related to the fact that personal contact was particularly valued by patients in times of COVID-19. Furthermore, it should be considered that in this exceptional situation, in which the healthcare system and the people working in it were pushed to their limits, they may be held in greater esteem by society.

In addition, we claimed that not only the time of rehabilitation, but also sociodemographic characteristics and their treatment might be related to factors of self-determination concerning rehabilitation treatment of coronary heart diseases in general. In particular, people of the age of 65 and older showed more scepticism regarding the rehabilitation treatment than younger ones, and also evaluated the relationship with the reference physician in a better way. In contrast, patients, who prefer to make decisions together with their reference physician, were not that sceptic concerning the rehabilitation treatment, but evaluated the relationship in a more critical way, especially during the COVID19 period. Furthermore, women showed significantly more active participation in the rehabilitation process in general. Moreover, patients with heart failure perceived a worse current state of health at the beginning of their rehabilitation than those without a heart failure diagnosis, independent from the time of rehabilitation.

Considering the theoretical background, the results contribute to the further refinement of the model of self-determination in medical rehabilitation, on the one hand by concretizing sociodemographic and treatment-relevant relations, and on the other hand by considering internal and external factors in times of exceptional situations. The findings suggest closer examination of age when considering the patient-provider-relationship and rehabilitation motivation, as well as gender when considering patient participation. Although relationship quality was rated better during the pandemic, the results suggest that we should continue to focus on enhancing patient participation in form of SDM. After all, most respondents preferred to decide between treatment options together with their reference physician.

Based on these theoretical considerations, results of this study may suggest relevant practical implications. Rehabilitation clinics could make targeted use of the time patients spend in isolation after arrival to prepare them for the goal-setting conversation with the reference physician. For example, anecdotes written down by former patients could get them in the mood to look at their own goals and help them pass the time on their own. In addition, a questionnaire with indication-specific categories, provided during the time of isolation, could also serve as further preparation for the SDM process. Another consideration is the transfer of goal conversations into virtual space (Abrams et al., 2020). This can give more room to active participation by reserving separate virtual appointments for SDM. Subsequently, restrictions on personal exchange due to hygiene measures can also be avoided.

To the best of our knowledge, this is the first study to examine the association between COVID-19 restrictions with patients' motivation, their perception of the patient-provider-relationship, their participation in the rehabilitation process and their current state of health at the beginning of their inpatient cardiac rehabilitation. Still there are some limitations that open the door for future research. Generalizability is limited due to a convenience sample that is represented by patients staying in a specific cardiac rehabilitation clinic. Therefore, the findings should be interpreted with caution and not be extrapolated for other cardiac clinics, rehabilitation indications or other fields in healthcare. Further studies should investigate the application to patients in other cardiac or even medical rehabilitation clinics in general and should also consider perspectives of other stakeholders like doctors, patients' partners or caregivers. However, the convenience sampling strategy provided the unique opportunity to provide initial real-life data on a rapidly evolving topic. In contrast to a retrospective study, the cross-sectional design was not limited through recall bias. Nevertheless, future longitudinal studies could shed more light on the development of and relations between factors of self-determination in medical rehabilitation, especially in exceptional situations, such as the COVID-19 pandemic. Finally, researchers could examine whether the quality of the patient-provider-relationship endures or reverts to former levels over time.

5. Conclusion

This study provided insights into the association between COVID-19 restrictions and patients' motivation, the patient-provider-relationship, active participation in the rehabilitation process and current state of health at the beginning of their rehabilitation, as perceived by patients during a challenging historical period that affected healthcare services as well as all other societal domains. In addition, this study found that among a convenience sample of patients in an inpatient cardiac rehabilitation clinic in Austria, people aged 65 or above showed more scepticism concerning the treatment and reported a high quality of the patient-provider-relationship, whereas patients, who prefer a shared decision with the reference physician, were more likely to report less scepticism regarding the rehabilitation treatment but evaluated the relationship more critically. Female participants were more likely to participate actively in the rehabilitation process and participants with a heart failure diagnosis reported a worse current state of health at the beginning of their rehabilitation. The spread of COVID-19 has led to new modalities of treatment to enable patients to continue rehabilitation in a safe environment in rehabilitation clinics. Based on the efforts of health professionals to mitigate the effects of social distancing during the COVID-19 pandemic, our results showed an increase in the quality of the patient-provider-relationship associated with steady motivation for rehabilitation, active participation and communication and state of health at the beginning of the rehabilitation stay. In light of the possibility of similar situations in the future, treatment providers should make targeted use of the time patients spend in isolation after arrival to prepare them for virtual goal-setting conversation with the reference physician and thereby enhance patient participation during exceptional situations.

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