

BMJ Open Satisfaction with rehabilitative health care services among German and non-German nationals residing in Germany: a cross-sectional study

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To cite: Brzoska P, Sauzet O, Yilmaz-Aslan Y, *et al.* Satisfaction with rehabilitative health care services among German and non-German nationals residing in Germany: a cross-sectional study. *BMJ Open* 2017;7:e015520. doi:10.1136/bmjopen-2016-015520

► Prepublication history for this paper is available online. To view these files please visit the journal online (<http://dx.doi.org/10.1136/bmjopen-2016-015520>).

Received 13 December 2016
Revised 13 May 2017
Accepted 16 June 2017



CrossMark

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ABSTRACT

Objectives Rehabilitation following medical conditions is largely offered as in-patient service in Germany. Foreign-national residents use rehabilitative services less often than Germans and attain less favourable treatment outcomes. These differences are independent of demographic, socioeconomic and health characteristics. Satisfaction with different aspects of rehabilitative care presumably affects the effectiveness of rehabilitative services. We compared the degree of satisfaction with different domains of the rehabilitative care process between Germans and non-German nationals residing in Germany.

Methods We used data from a cross-sectional rehabilitation patient survey annually conducted by the German Statutory Pension Insurance Scheme. The sample comprises 274 513 individuals undergoing medical rehabilitation in 642 hospitals during the years 2007–2011. Participants rated their satisfaction with different domains of rehabilitation on multi-item scales. We dichotomised each scale to low/moderate and high satisfaction. For each domain, a multilevel adjusted logistic regression analysis was conducted to examine differences in the levels of satisfaction between German and non-German nationals. Average marginal effects (AMEs) and 99.5% CI were computed as effect estimates. AMEs represent differences in the probability for the occurrence of the outcome.

Results Turkish nationals had a higher probability for being less satisfied with most aspects of their rehabilitation, with AMEs ranging between 0.05 (99.5% CI 0.00 to 0.09) for 'satisfaction with psychological care' and 0.11 (99.5% CI 0.08 to 0.14) for 'satisfaction with treatments during rehabilitation'. Patients from former Yugoslavia and from Portugal/Spain/Italy/Greece were as satisfied as Germans with most aspects of their rehabilitation.

Conclusions Turkish nationals are less satisfied with their rehabilitative care than other population groups. This may be attributable to the diversity of the population in terms of its expectations towards rehabilitation. Rehabilitative care institutions need to provide services that are sensitive to the needs of all clients. Diversity management can contribute to this process.

INTRODUCTION

The populations of many European countries comprise large proportions of foreign

Strengths and limitations of this study

- The study is the first to compare the satisfaction with rehabilitative care between German and non-German nationals residing in Germany.
- We use data from a national sample survey of hospitals that provide rehabilitation for individuals of working age.
- The survey is conducted in German language, so our investigation, despite adjustment, is prone to selection bias and possibly underestimates differences in healthcare satisfaction between Germans and non-Germans.

nationals.¹ In Germany, about 10% of the 81 million inhabitants have no German citizenship. Turkish nationals form the largest population group of non-German nationals, totalling about 1.5 million individuals. Other large population groups of foreign nationals in Germany are individuals with a nationality from a Former Yugoslavian country (about 1 million) and from one of the South European countries Portugal, Spain, Italy or Greece (about 1.1 million).² Many of these individuals came to Germany as labour migrants and settled in the country together with their families. Foreign nationals differ from the majority populations of the countries they reside in with respect to many health aspects.^{3 4} In terms of their occupational health, they are at a higher risk of occupational accidents and diseases and at a higher risk of retirement due to disability.^{5–7} In part, this results from disadvantageous environmental and social factors they are exposed to such as poor working conditions and a lower socioeconomic status.^{4 8 9}

Tertiary preventive health services such as medical rehabilitation are particularly important for this population group because they are able to prevent (work-related)

invalidity and to mitigate the consequences of chronic diseases.¹⁰ In Germany, different healthcare institutions are in charge of covering the costs for rehabilitative care. Rehabilitations for individuals in working age are covered by the German Statutory Pension Insurance Scheme ('Deutsche Rentenversicherung'), which accounts for about two-thirds of all rehabilitations provided in Germany.¹¹ In over 90% of all cases, rehabilitation in Germany is usually conducted by means of 3-week in-patient programmes carried out in specialised hospitals.¹² Studies from Germany show that non-German nationals use rehabilitation services less often than Germans despite being equally entitled to use these services free or for a low charge (depending on the type of insurance a contribution of up to €10 per day of treatment has to be made by patients) as part of their social insurance¹³ (this does not apply to refugees and asylum seekers who are initially only entitled to receive free emergency care^{14 15}). In addition, those non-Germans who make use of rehabilitation programmes benefit less from these services than their German counterparts even after adjusting for demographic and socioeconomic factors as well as disease profiles. This is particularly true for Turkish nationals and becomes evident in a lower occupational performance, a higher risk of disability retirement after rehabilitation^{13 16} and a lower self-perceived effectiveness of rehabilitative treatment.¹⁷ Similar observations were made in the Netherlands.^{18 19}

Qualitative studies focusing on potential barriers that non-German nationals may encounter in the rehabilitative system suggest that the satisfaction with different components of the rehabilitative care process has a large impact on the effectiveness of rehabilitation in this population group.^{20–22} This is in line with research findings showing that the satisfaction with healthcare services is positively associated with coping with disease and health outcomes.^{23–27} In Germany and other Western countries, migrants, on average, have a lower satisfaction with different primary and secondary healthcare services than non-migrants.^{28–31} Little is known about the satisfaction of migrants concerning rehabilitative care services. The aim of the present study was to compare the degree of satisfaction with different aspects of the rehabilitative care process between German and non-German nationals. Since patient satisfaction results from the subjective evaluation of the gap between patients' own expectations towards healthcare and their perceptions of actual healthcare reality,³² knowledge about possible differences in the satisfaction between both populations can help to adjust rehabilitative care to the objective and subjective needs of migrants. Although the German system of rehabilitation differs from that of other countries,¹² insights into the satisfaction of non-Germans with respect to different aspects of healthcare provision can also contribute to devising migrant-sensitive healthcare in other settings.

MATERIALS AND METHODS

Data

To examine the degree of satisfaction with different aspects of rehabilitation, we drew on data from a cross-sectional and representative rehabilitation patient survey ('Rehabilitandenbefragung') annually conducted by the German Statutory Pension Insurance Scheme among individuals who completed rehabilitation granted by this organisation. The rehabilitation survey is conducted as part of an external quality assurance programme implemented by the German Statutory Pension Insurance Scheme for institutions providing rehabilitative care. On a monthly basis, 20 individuals from each of the 642 hospitals who completed rehabilitation are selected at random and surveyed at home by means of a postal German-language self-administered questionnaire 8–12 weeks after their discharge from the rehabilitation hospital. The survey is voluntary, and patients provide a written informed consent for participation. The average response rate per year is 55%.³³ The survey and the use of the data for purposes of secondary data analysis follow the requirements as defined by the German Social Code VI, IX and X. Since the data are fully anonymised, no additional ethical approval for the present analysis was necessary.³⁴

For the current study, we used data from all 642 hospitals on 274513 individuals who underwent in-patient medical rehabilitation because of somatic disease during 2007–2011.

Measures

Patients who participate in the survey are asked to report their satisfaction with different domains of the rehabilitation process by means of 40 items, most of which provide a 5-point Likert response format. The domains comprise the satisfaction with different aspects of care (see [table 1](#) for an overview of exemplary questions). Additionally, survey participants are requested to provide an overall rating of their satisfaction with the rehabilitation they received. The different domains of patient satisfaction were operationalised in the same way that also the German Statutory Pension Insurance Scheme employs for its internal quality reports. The satisfaction with each domain was rated from 1 to 5 by calculating mean scores of the respective items of each scale with higher means indicating a greater satisfaction. Because the mean scores were highly left skewed, assumptions for linear regression were not fulfilled. We therefore decided to dichotomise the scores for purposes of analysis, with values <4 indicating a low or moderate satisfaction and values ≥4 indicating a high satisfaction. This procedure is in line with other studies in the field.²⁹

We excluded the domains 'recommendations received during the stay in the hospital', 'preparation for the time after discharge' and 'quality and comprehensiveness of services in the hospital' because they combined items with unequal response formats or had a low internal consistency (see [table 1](#)). Cronbach's alpha for the remaining

Table 1 Domains of rehabilitation that participants in the rehabilitation patient survey of the German Statutory Pension Insurance Scheme are asked to report their satisfaction with

Domain of rehabilitation (satisfaction with...)	Items (n)	Sample item*	Response format*	Cronbach's alpha	Eligible respondents (n)
Medical care	3	The doctor was sympathetic and understanding	No; rather no; neither yes nor no; rather yes; yes	0.88	272 806
Psychological care	3	The psychologist provided clear background information and explanations to me	No; rather no; neither yes nor no; rather yes; yes	0.93	95 320
Nursing care	3	The nurse informed and instructed me well and clearly	No; rather no; neither yes nor no; rather yes; yes	0.90	262 030
Health education during rehabilitation	6	How do you rate the following presentations, seminars or trainings on...: for example, pain and coping with pain?	Very bad; bad; so,so; good; very good	0.89	184 941
Treatments during the rehabilitation	6	How do you rate the following treatments? For example, relaxation exercises	Very bad; bad; so,so; good; very good	0.82	236 961
Counselling during rehabilitation	4	How do you rate the following counselling services on...: for example, legal aspects?	Very bad; bad; so,so; good; very good	0.85	95 677
Agreement on treatment goals	5	My doctors and therapists talked with me about the goals of my treatment	No; rather no; neither yes nor no; rather yes; yes	0.87	236 961
Overall satisfaction	1	How do you rate your rehabilitation in general?	Very poor; poor; so,so; good; very good	–	268 198
Quality and comprehensiveness of services in the hospital	4	The hospital provided the appropriate services, treatments and consultation for my problems	(Each item with a different 5-point Likert scale)	0.70	274 256
Preparation for the time after discharge from the rehabilitation hospital	3	I was well prepared for the time after my rehabilitation	(Combination of polytomous and dichotomous level items)	–	219 613
Recommendations received during the stay in the hospital (about patients' health behaviour during occupational and leisure-time activities) ²	2	I received helpful recommendations about my health behaviour at home and during leisure-time activities	No; rather no; neither yes nor no; rather yes; yes	0.66	223 882

*Translation from German into English by the authors of this article.

†Not included into analysis because domains combined items with unequal response formats or had a low internal consistency.

domains ranged between 0.82 and 0.93, indicating satisfactory internal consistency.³⁵

Since the range of treatment components that patients receive during rehabilitation varies between individuals (eg, not all patients receive psychological care during their stay), the available sample sizes differed for the eight domains of satisfaction, ranging between $n=95\,320$ for satisfaction with psychological care and $n=274\,256$ for satisfaction with the agreement on treatment goals.

Aside from a comparison of German and non-German nationals, the dataset allowed to stratify non-German nationality by four subgroups: Turkey, Former Yugoslavia, Portugal/Spain/Italy/Greece and 'other'. This stratification was chosen because it is the one used in other routine datasets from social security organisations in Germany and allows comparison with previous studies in the field.³⁶

As relevant covariates, the dataset provided information on age (in years), sex, marital status (single/divorced/widowed, married), education (low, intermediate, high, other/unknown), occupational position (skilled labour, semiskilled/unskilled labour, trainee/unemployed), on the type of somatic diagnosis on admission to rehabilitation (diseases of the skeletal system [ICD-10 codes M00-M99], neoplasms [ICD-10 codes C00-D48], diseases of the circulatory system [ICD-10 codes I00-I99], other) and on the time absent from work due to illness in the last 12 months before rehabilitation (0 months, <3 months, 3 to <6 months, ≥ 6 months, not employed). Type of somatic diagnosis and time absent from work were considered as proxy variables for disease severity. We also took into account information on whether respondents received assistance in completing the self-administered questionnaire, which was regarded a proxy for German-language proficiency, for comprehensibility of the questionnaire and for other factors that limited patients in filling in the questionnaire on their own.³⁷⁻³⁹ Finally, we considered the type of rehabilitation (rehabilitation directly following a general hospital stay vs rehabilitation provided independently of a prior general hospital stay). All variables had less than 3% of missing values. Cases with missing values were deleted from the analysis (list-wise deletion). A sensitivity analysis that was conducted using multiple imputation did not reveal any relevant differences between analyses based on imputed versus non-imputed data.

Statistical analysis

We calculated descriptive statistics stratified by nationality for purposes of sample description using arithmetic means, SD and frequencies. Independent Student's *t*-tests and χ^2 tests for independence, respectively, were used to statistically test for differences between the nationality strata.

To adjust for socioeconomic and health differences between the population groups, we calculated multivariable logistic regression models and controlled for the covariates described above. In order to allow comparisons of effect estimates across the eight different domains of

satisfaction (outcomes), we computed average marginal effects (AMEs) instead of ORs.⁴⁰ AMEs represent the change of the probability for the outcome by each unit increase of an independent variable with all other variables of the model being held constant and averaged across all respondents.⁴¹ We conducted a multilevel analysis to account for the fact that respondents were clustered within the 642 rehabilitation hospitals.

To account for multiple testing in the descriptive and multivariable comparison of the eight satisfaction scale scores across groups, we used a conservative significance level of $\alpha=0.05/10=0.005$. For this purpose, AMEs and their 99.5% CI are provided for all multivariable models.

All analyses were performed using Stata 12.⁴²

RESULTS

Data for 274 517 individuals were available who completed an in-patient medical rehabilitation in the years 2007–2011. Of these, 0.9% ($n=2429$) had a nationality from a former Yugoslavian country, 0.8% ($n=2301$) were nationals from Turkey, 0.8% ($n=2180$) held a nationality from the South European countries Portugal, Spain, Italy or Greece and 2.5% ($n=5244$) were nationals from other countries. In total, 4.4% ($n=12\,154$) of the sample comprised individuals of non-German nationality.

Table 2 gives an overview of the sample characteristics stratified by nationality. Aside from a higher male-to-female ratio and a lower occupational position in non-German nationals, the population groups also differed with respect to their underlying diseases conditions. The proportion of individuals who rated their satisfaction with rehabilitation as low or moderate also differed between the population groups (table 3). As compared with Germans, Turkish nationals were less satisfied with all but one ('satisfaction with agreement on treatment goals') domain of their rehabilitation. Differences ranged between 5.5 ('satisfaction with psychological care') and 18.9 percentage points ('overall satisfaction with rehabilitation'). Rehabilitation patients with a nationality from a Former Yugoslavian country or from Portugal, Spain, Italy or Greece were equally satisfied with most of the domains of their rehabilitation as Germans. Lower satisfaction ratings as compared with Germans were only observed for the domain of treatments during rehabilitation and with respect to its overall evaluation. For the domains of psychological care and agreement on treatment goals, the proportion of poorly satisfied patients among non-Germans was significantly lower than among Germans.

Table 4 shows the results of the multivariable logistic regression models with low/moderate satisfaction with each of the eight dimensions as the dependent variable. The multivariable findings resemble the results of the descriptive analysis. As becomes evident, Turkish nationals had a higher probability for being less satisfied with all but two ('agreement on treatment goals' and 'medical care') domains of their rehabilitation, with AMEs ranging between 0.06 (99.5% CI 0.03 to 0.09) for

Table 2 Description of the study sample stratified by nationality (participants of the rehabilitation patient survey of the German Statutory Pension Insurance Scheme conducted between 2007 and 2011, n=274513)

	Nationality					Total (n=274517)
	German (n=262363)	Turkish (n=2301)	Former Yugoslavian (n=2429)	Portugal/Spain/Italy/Greece (n=2180)	Other (n=5244)	
Age in years (mean; SD)	53.4 10.1	47.9 9.4	53.3 8.9	52.2 8.8	52.1 9.0	53.3 10.1
Sex (n, %)						
Male	129023 49.2	1450 63.0	1299 53.5	1407 64.5	2860 54.6	136039 49.6
Female	133340 50.8	851 37.0	1130 46.5	773 35.5	2380 45.4	138474 50.4
Marriage status (n, %)						
Single/divorced/widowed	72288 28.2	288 12.5	488 20.2	436 20.1	1222 23.6	74722 27.8
Married	184423 71.8	2008 87.5	1932 79.8	1737 79.9	3953 76.4	194053 72.2
Education (n, %)						
Low (Reference)	112714 43.0	1590 69.1	1284 52.9	1522 69.8	1716 32.7	118826 43.3
Intermediate	83757 31.9	291 12.6	544 22.4	273 12.5	1279 24.4	86144 31.4
High	39002 14.9	111 4.8	257 10.6	144 6.6	1238 23.6	40752 14.8
Other/unknown	26878 10.2	309 13.4	344 14.2	241 11.1	1007 19.2	28779 10.5
Occupational position (n, %)						
Skilled labour	176520 68.8	917 39.9	1126 46.5	1016 46.8	2910 56.3	182489 67.9
Semiskilled/unskilled labour	33950 13.2	1157 50.4	1051 43.4	960 44.2	1668 32.3	38786 14.4
Trainee/not employed	46051 18.0	222 9.7	243 10.0	196 9.0	594 11.5	47306 17.6
Time absent from work in the last 12 months (n, %)						
None	39414 15.3	304 13.3	271 11.2	250 11.6	774 15.0	41013 15.2
<3 months	119975 46.6	940 41.2	1087 45.0	1052 48.6	2402 46.5	125456 46.6
3–6 months	27013 10.5	366 16.1	387 16.0	305 14.1	671 13.0	28742 10.7
6+ months	30947 12.0	474 20.8	445 18.4	362 16.7	819 15.9	33047 12.3
Not employed	39909 15.5	195 8.6	225 9.3	194 9.0	495 9.6	41018 15.2
Diagnosis at rehabilitation entry (n, %)						
Skeletal system	110906 42.3	1243 54.0	1325 54.5	1100 50.5	2447 46.7	117021 42.6
Neoplasms	50821 19.4	168 7.3	333 13.7	300 13.8	711 13.6	52333 19.1
Circulatory system	35177 13.4	309 13.4	276 11.4	284 13.0	726 13.8	36772 13.4
Respiratory system	9029 3.4	69 3.0	46 1.9	70 3.2	183 3.5	9397 3.4
Other	56430 21.5	512 22.3	449 18.5	426 19.5	1177 22.4	58994 21.5
Type of rehabilitation (n, %)						

Continued

Table 2 Continued

	Nationality					Total (n=274 517)
	German (n=262 363)	Turkish (n=2301)	Former Yugoslavian (n=2429)	Portugal/Spain/Italy/ Greece (n=2180)	Other (n=5244)	
Hospital follow-up	97 036 37.0	786 34.2	760 31.3	733 33.6	1906 36.3	101 221 36.9
Not hospital follow-up	165 327 63.0	1515 65.8	1669 68.7	1447 66.4	3338 63.7	173 296 63.1
Assistance received in completing questionnaire (n, %)						
No	2 48 571 95.5	998 44.0	1 503 62.8	1 180 54.7	3 901 75.0	256 153 94.1
Yes	11 720 4.5	1 272 56.0	890 37.2	979 45.3	1 301 25.0	16 162 5.9

the domain of 'satisfaction with nursing care' and 0.12 (99.5% CI 0.09 to 0.16) for the domain of 'satisfaction with treatments during the rehabilitation'. Rehabilitation patients with a nationality from a former Yugoslavian country or from Portugal, Spain, Italy or Greece were as equally satisfied with most aspects of their rehabilitation as Germans. A lower satisfaction rating for patients from Portugal, Spain, Italy or Greece was only observed for the domain of 'satisfaction with treatments during rehabilitation' (AME=0.04; 99.5% CI 0.01 to 0.07). As compared with Germans, both population groups reported a higher satisfaction with psychological care (AME=-0.05; 99.5% CI -0.09 to -0.01 and AME=-0.07; 99.5% CI -0.11 to -0.02, respectively) and with the agreement on treatment goals (AME=-0.10; 99.5% CI -0.13 to -0.06 and AME=-0.05; 99.5% CI -0.08 to -0.01, respectively). In addition, patients from Former Yugoslavia reported higher satisfaction ratings with health education during rehabilitation (AME=-0.04; 99.5% CI -0.08 to -0.01). Unlike for Turkish nationals, no differences in the overall evaluation of rehabilitation were observed between Germans and the other groups of non-German nationals.

Regarding the covariates the analysis was adjusted for, a shorter time of being absent from work, lower age, being married and undergoing treatment because of cancer were associated with higher satisfaction ratings for all domains of rehabilitation. For some domains, respondents who received assistance in completing the questionnaire provided higher satisfaction ratings than individuals who completed the questionnaire on their own. Individuals who attended rehabilitation as a follow-up treatment to their hospital stay reported higher satisfaction scores than patients whose rehabilitation was not related to a previous hospital stay. For most domains, no significant association between occupational position and satisfaction was observed.

DISCUSSION

Foreign nationals residing in Germany and other European countries, on average, have a lower utilisation of rehabilitation and benefit less from rehabilitative services than the respective majority population. Given the association of healthcare satisfaction and healthcare outcomes, knowledge about possible differences in the satisfaction between the foreign and autochthonous population can help to adjust rehabilitative care to the objective and subjective needs of the entire population. In this study, we examined the satisfaction with different aspects of the rehabilitative care process in Germans and non-Germans residing in Germany. We showed that Turkish nationals are less satisfied with almost all of the domains of rehabilitation studied. Similar observations were made in other healthcare settings in several European countries.²⁹ We can confirm this finding for the field of rehabilitative care for Turks residing in Germany. In addition, our study shows that it is important to take into account the heterogeneity of the population in health services research.

Table 3 :Satisfaction with different aspects of rehabilitation stratified by nationality (participants of the rehabilitation patient survey of the German Statutory Pension Insurance Scheme conducted between 2007 and 2011)

Domain of rehabilitation (satisfaction with...)	Nationality					Total (n=274517)
	German (n=262363)	Turkish (n=2301)	Former Yugoslavian (n=2429)	Portugal/Spain/Italy/Greece (n=2180)	Other (n=5244)	
Medical care (n, %)						
High	1 78214 68.3	1433 62.6	1685 69.8	1520 70.3	3799 73.1	186651 68.4
Low/moderate	82 531 31.7	855 37.4	728 30.2	641 29.7	1400 26.9	86 155 31.6
Psychological care (n, %)						
High	66 935 73.8	632 68.3	822 80.0	646 79.2	1434 77.1	70 469 73.9
Low/moderate	23 755 26.2	293 31.7	206 20.0	170 20.8	427 22.9	24 851 26.1
Nursing care (n, %)						
High	204 969 81.9	1676 75.0	1935 83.5	1752 83.4	4239 84.2	214 571 81.9
Low/moderate	45 376 18.1	560 25.0	381 16.5	348 16.6	794 15.8	47 459 18.1
Health education during rehabilitation (n, %)						
High	114 185 64.5	676 48.9	1094 65.8	883 62.2	2358 68.3	119 196 64.5
Low/moderate	62 839 35.5	706 51.1	568 34.2	536 37.8	1096 31.7	65 745 35.5
Treatments during the rehabilitation (n, %)						
High	1 72 355 76.0	1086 58.8	1426 71.0	1246 68.7	3356 75.5	179 469 75.7
Low/moderate	54 489 24.0	761 41.2	583 29.0	568 31.3	1091 24.5	57 492 24.3
Counselling during rehabilitation (n, %)						
High	54 854 60.0	361 47.7	493 57.4	429 57.1	1156 60.8	57 293 59.9
Low/moderate	36 554 40.0	396 52.3	366 42.6	322 42.9	746 39.2	38 384 40.1
Agreement on treatment goals (n, %)						
High	1 06 192 41.4	969 43.2	1211 51.2	998 46.9	2525 49.2	111 895 41.7
Low/moderate	1 50 480 58.6	1 274 56.8	1 154 48.8	1 131 53.1	2 603 50.8	1 56 642 58.3
Overall satisfaction (n, %)						
High	1 96 842 76.7	1 278 57.9	1 626 69.6	1 469 69.6	3 891 76.8	205 106 76.5
Low/moderate	59 632 23.3	931 42.1	709 30.4	643 30.4	1 177 23.2	63 092 23.5

Table 4 : Results of the multivariable logistic regression models for each of the eight domains of rehabilitation with a low/moderate satisfaction as the dependent variable

	Medical care (n=272806)		Psychological care (n=95320)		Nursing care (n=262030)		Health education during rehabilitation (n=184941)		Treatments during rehabilitation (n=236961)		Counselling during rehabilitation (n=95677)		Agreement on treatment goals (n=268537)		Overall satisfaction (n=268198)	
	AME	99.5% CI	AME	99.5% CI	AME	99.5% CI	AME	99.5% CI	AME	99.5% CI	AME	99.5% CI	AME	99.5% CI	AME	99.5% CI
Nationality																
German (reference)																
Portugal/Spain/Italy/Greece	-0.03	-0.06 to 0.00	-0.07	-0.11 to -0.02	-0.01	-0.04 to 0.01	0.00	-0.04 to 0.04	0.04	0.01 to 0.08	-0.03	-0.08 to 0.03	-0.05	-0.08 to -0.01	0.02	-0.01 to 0.05
Former Yugoslavia	-0.03	-0.06 to 0.00	-0.05	-0.09 to -0.01	-0.02	-0.04 to 0.01	-0.04	-0.08 to -0.01	0.02	-0.01 to 0.05	-0.02	-0.07 to 0.03	-0.10	-0.13 to -0.06	0.02	-0.01 to 0.04
Turkey	0.03	-0.01 to 0.06	0.07	0.01 to 0.12	0.06	0.03 to 0.09	0.10	0.05 to 0.14	0.12	0.09 to 0.16	0.06	0.00 to 0.12	-0.02	-0.05 to 0.02	0.09	0.06 to 0.13
Other	-0.06	-0.08 to -0.04	-0.04	-0.08 to -0.01	-0.03	-0.04 to -0.01	-0.06	-0.09 to -0.04	-0.01	-0.03 to 0.01	-0.04	-0.08 to -0.01	-0.08	-0.10 to -0.06	-0.03	-0.04 to -0.01
Age (in years)	-0.01	-0.01 to <0.00	<0.00	<0.00 to <0.00	<0.00	<0.00 to <0.00	<0.00	-0.01 to <0.00	<0.00	<0.00 to <0.00	<0.00	<0.00 to <0.00	<0.00	<0.00 to <0.00	<0.00	<0.00 to <0.00
Sex																
Male (reference)																
Female	0.01	-0.00 to 0.01	-0.03	-0.04 to -0.02	0.03	0.03 to 0.04	-0.01	-0.02 to <0.00	-0.02	-0.02 to -0.01	-0.04	-0.05 to -0.03	0.04	0.03 to 0.04	0.01	0.00 to 0.01
Marriage status																
Single/divorced/widowed (reference)																
Married	-0.01	-0.01 to <0.00	-0.02	-0.03 to -0.01	-0.01	-0.02 to -0.01	-0.01	-0.02 to -0.01	-0.01	-0.02 to <0.00	-0.01	-0.02 to <0.00	-0.01	-0.01 to <0.00	-0.01	-0.02 to -0.01
Education																
Low (reference)																
Intermediate	0.00	-0.01 to 0.00	0.01	<0.00 to 0.02	0.00	-0.01 to 0.01	-0.01	-0.02 to -0.00	0.00	-0.01 to 0.00	-0.01	-0.03 to -0.00	0.00	-0.01 to 0.01	-0.03	-0.03 to -0.02
High	0.00	-0.01 to 0.00	0.01	-0.01 to 0.02	0.01	-0.00 to 0.01	0.00	-0.01 to 0.02	0.00	-0.01 to 0.01	-0.01	-0.03 to 0.00	0.00	-0.01 to 0.01	-0.05	-0.05 to -0.04
Other/unknown	-0.02	-0.03 to <0.00	0.00	-0.01 to 0.02	-0.00	-0.01 to 0.00	-0.01	-0.02 to 0.00	0.00	-0.02 to 0.01	-0.02	-0.04 to -0.00	-0.02	-0.03 to -0.01	-0.02	-0.03 to -0.01
Occupational position																
Skilled labour (reference)																
Semiskilled/unskilled labour	-0.02	-0.02 to -0.01	-0.01	-0.02 to 0.01	-0.01	-0.02 to -0.01	-0.01	-0.02 to 0.00	0.00	-0.01 to 0.00	0.01	-0.01 to 0.02	-0.02	-0.03 to -0.01	0.01	<0.00 to 0.02
Trainee/not employed	0.00	-0.03 to 0.02	0.00	-0.03 to 0.04	0.01	-0.00 to 0.03	0.01	-0.02 to 0.03	0.01	-0.01 to 0.03	0.02	-0.02 to 0.06	0.01	-0.01 to 0.03	0.02	<0.00 to 0.04
Time absent from work in the last 12 months																
None (reference)																

Continued

Table 4 Continued

	Health												Overall satisfaction (n=268198)		
	Medical care (n=272806)		Psychological care (n=95320)		Nursing care (n=262030)		education during rehabilitation (n=184941)		Treatments during rehabilitation (n=236961)		Counselling during rehabilitation (n=95677)			Agreement on treatment goals (n=268537)	
	AME	99.5% CI	AME	99.5% CI	AME	99.5% CI	AME	99.5% CI	AME	99.5% CI	AME	99.5% CI	AME	99.5% CI	
<3 months	0.01	-0.00 to 0.01	0.00	-0.02 to 0.01	<0.00 to 0.01	-0.01 to 0.01	0.01	<0.00 to 0.01	0.01	-0.01 to 0.02	0.01	<0.00 to 0.02	0.00	<0.00 to 0.01	
3-6 months	0.03	0.01 to 0.04	0.00	-0.01 to 0.02	0.01 to 0.02	0.00 to 0.03	0.02	0.01 to 0.03	0.02	0.00 to 0.04	0.01	0.00 to 0.03	0.06	0.05 to 0.07	
6+ months	0.07	0.06 to 0.08	0.03	0.01 to 0.05	0.02 to 0.04	0.04 to 0.06	0.05	0.04 to 0.06	0.07	0.05 to 0.09	0.04	0.03 to 0.05	0.12	0.11 to 0.14	
Not employed	0.04	0.01 to 0.07	0.02	-0.03 to 0.07	0.01 to 0.04	0.00 to 0.08	0.04	0.02 to 0.08	0.05	-0.01 to 0.05	-0.01	-0.04 to 0.02	0.07	0.04 to 0.10	
<i>Self-rated performance before rehabilitation</i>															
Mediocre/high (reference)															
Low	0.02	0.01 to 0.03	0.00	-0.01 to 0.01	0.01 to 0.02	0.00 to 0.02	0.01	<0.00 to 0.01	0.04	0.03 to 0.05	-0.01	-0.02 to -0.01	0.03	0.03 to 0.04	
<i>Diagnosis at rehabilitation entry</i>															
Skeletal system (reference)															
Neoplasms	-0.07	-0.09 to -0.05	-0.03	-0.05 to -0.01	-0.04 to -0.02	-0.06 to -0.01	-0.04	-0.06 to -0.03	-0.04	-0.13 to -0.10	-0.05	-0.07 to -0.03	-0.05	-0.07 to -0.04	
Circulatory system	-0.03	-0.05 to -0.02	0.00	-0.03 to 0.02	-0.02 to 0.00	-0.04 to -0.01	-0.02	-0.02 to 0.01	0.01	-0.04 to 0.03	-0.03	-0.05 to -0.01	-0.01	-0.02 to 0.00	
Respiratory system	-0.02	-0.05 to 0.00	0.01	-0.03 to 0.05	-0.02 to 0.00	-0.06 to 0.00	-0.02	-0.04 to 0.00	-0.04	-0.08 to 0.01	-0.03	-0.06 to -0.00	0.00	-0.03 to 0.02	
other	-0.02	-0.03 to -0.01	0.01	-0.03 to 0.01	-0.02 to -0.01	-0.03 to -0.00	-0.01	-0.02 to -0.00	-0.02	-0.03 to -0.00	-0.01	-0.02 to 0.00	-0.01	-0.02 to 0.00	
<i>Type of rehabilitation</i>															
Hospital follow-up (reference)															
Not hospital follow-up	0.05	0.05 to 0.06	0.03	0.02 to 0.05	0.02 to 0.03	0.01 to 0.03	0.02	0.02 to 0.04	0.04	0.03 to 0.05	0.02	0.01 to 0.03	0.05	0.04 to 0.05	
<i>Assistance received in completing questionnaire</i>															
No (reference)															
Yes	-0.05	-0.07 to -0.04	-0.02	-0.04 to 0.01	-0.03 to -0.02	-0.02 to 0.01	0.00	-0.01 to 0.02	0.00	-0.03 to 0.02	-0.05	-0.07 to -0.04	0.02	0.01 to 0.04	

AME, average marginal effect. Average marginal effects and 99.5% CI (participants of the rehabilitation patient survey of the German Statutory Pension Insurance Scheme conducted between 2007 and 2011). Significant effects are printed in bold face.

Unlike Turkish nationals, individuals originating from a Former Yugoslavian country or from Portugal, Spain, Italy or Greece were as satisfied as Germans with most aspects of their rehabilitation, including their overall evaluation of the services received. This suggests that rehabilitative care institutions in Germany are better able to meet the needs of these groups of migrants than they are for patients of Turkish origin.

To the best of our knowledge, the only quantitative investigation into the satisfaction of Turkish migrant patients in Germany has been conducted by Borde *et al.*³¹ The authors studied 320 women of German and 262 women of Turkish origin with respect to their satisfaction with seven domains of obstetrics treatment at a large university hospital in Berlin, Germany. They found that women of Turkish origin were less satisfied with six of the seven domains studied, comprising medical, nursing and psychosocial care, the information received as well as food and accommodation provided during the stay.

In our study, comparably large differences between Turkish and German nationals in Germany could be observed for the satisfaction with health education and with treatments provided during the rehabilitation. In these two domains, the likelihood of a low or moderate satisfaction was 10 and 12 percentage points, respectively, higher among Turkish nationals than among Germans. This corresponds to findings from qualitative studies that focused on potential barriers that Turkish migrants may encounter in the rehabilitative system.^{20–22} These investigations showed that communication problems between patients and healthcare providers resulting from poor German language proficiency may interfere with an adequate provision of rehabilitation for patients of Turkish origin. Patients and providers reported that language problems make it difficult to instruct patients about therapies and to communicate with them during exercises. In addition, most hospitals are not able to offer information and education services in Turkish language, which is why Turkish patients usually attend German-language services. Because of low German language proficiency, some Turkish patients are not able to fully comprehend the content provided. This may result in a poor satisfaction with rehabilitative services. However, since we adjusted our multivariable analysis for German-language competency by means of a proxy variable and given the fact that only a German-language questionnaire was used, it is unlikely that the lower satisfaction with rehabilitation among Turks migrants may be fully explained by poor German language proficiency.

Aside from language proficiency, therefore, other explanatory factors for the low satisfaction in Turkish nationals need to be considered. Also, cultural and religious needs that are not sufficiently taken into account by rehabilitative care institutions may have a negative effect on the provision of rehabilitative care.^{21 22} Apart from culture-specific illness perceptions, they comprise different cultural taboos such as exercising together with fellow patients from the opposite sex or being medically

examined by health professional from the opposite sex. If health providers are not aware of these diverse expectations or neglect to deal with them appropriately, this may lead to frustration and poor satisfaction with the rehabilitative care received. Furthermore, Turkish migrants have been reported to be socially less integrated⁴³ and to have stronger perceptions about being discriminated against⁴⁴ than other groups of migrants in Germany, including people of South European and Former Yugoslavian origin. This can also affect the interaction within health-care institutions and may limit perceived possibilities to communicate own expectations concerning healthcare. A lower satisfaction with healthcare in Turkish nationals may also be responsible for poorer rehabilitative outcomes in this population group that have been reported by other studies.^{13 16 17}

The association between low/moderate satisfaction and the sociodemographic variables that we took into account as covariates into our multivariable analysis are mostly in line with those identified in other studies on the satisfaction with healthcare services.^{45 46} Depending on the underlying diagnosis, individuals had a higher or lower likelihood of a low satisfaction rating. This can be explained by the different treatment regimes that patients receive depending on their diagnoses as well as by differences in overall impairment. Notably, patients undergoing rehabilitation because of cancer reported a higher satisfaction than patient receiving treatment because of other conditions. This has also been observed in previous studies.⁴⁷

Strengths and limitations

A strength of our study is the use of routine survey data from an internal quality assurance programme implemented by a large social security organisation in Germany, which accounts for the majority of rehabilitations provided in Germany.^{48 49} The data can be considered to be of high quality as different measures of quality control are implemented in the survey including high standards for data protection.³⁴

The present study also has some limitations. All patients randomly selected by the German Statutory Pension Insurance Scheme receive a German-language questionnaire and are invited to take part in the survey by means of a German-language invitation letter. It is likely that this approach leads to a selection bias among patients who are not fluent in the German language. We tried to adjust for this shortcoming by including information on assistance received in completing the questionnaire into the multivariable analysis following the approach of previous research.^{17 37–39 50} Still, it cannot be ruled out that patients with little proficiency of the German language interpreted questions differently than German nationals or did not respond to survey invitations at all. This may have distorted our findings and presumably also affects the sociodemographic composition of rehabilitation patients who took part in the survey. Although the sociodemographic composition within the five nationality

strata of our sample corresponds to sociodemographic characteristics of all individuals who completed medical rehabilitation in the respective time period, the proportion of non-German nationals was lower than expected. In our sample, 0.9%, 0.8% and 0.8% of all individuals had a nationality from Former Yugoslavia, Turkey and Portugal/Spain/Italy/Greece, respectively. In contrast, of those who completed medical rehabilitation in the years 2007–2011, about 1.1%, 1.4% and 1.0% had a nationality from Former Yugoslavia, Turkey and Portugal/Spain/Italy/Greece, respectively (data not shown). As becomes evident, the difference between the expected and observed proportion of non-German individuals in our sample is particularly pronounced for patients of Turkish origin. This may result from the fact that this population is particularly prone to low German language proficiency.⁵¹ Given the fact that those not fluent in the German language are underrepresented in our data and considering that poor language proficiency is a significant barrier in healthcare,^{21 22} our investigation likely underestimates the true difference in healthcare satisfaction between German and non-German nationals. The level of income as an important socioeconomic variable could not be taken into account as a covariate. Therefore, our results might be partially biased by residual confounding. We compared non-German and German nationals and because of limited information were not able to also take into account migrants who have a German citizenship (eg, foreign nationals who got naturalised after migrating to Germany or those who received German citizenship at birth as children born to non-German parents residing in Germany). This is a limitation frequently encountered in the analysis of routine data sets in Germany.³⁶ However, we consider this to be a minor limitation since other studies in the field of rehabilitation that were able to also include the latter group of migrants showed that they experience similar barriers to healthcare access and effectiveness than non-German nationals.^{52 53} We could not adjust for culture, religion, length of stay and acculturation in our analysis, which may be significantly related to patients' satisfaction with healthcare.^{30 54} Future studies should therefore also examine their role for differences in satisfaction between migrants and non-migrants in order to devise more adequate patient-oriented services for this population group.

CONCLUSION

Knowledge on the levels of patients' satisfaction with healthcare provision is important in order to adjust healthcare to their objective and subjective needs, to meet their expectations and to ensure a high standard of healthcare quality. Our study showed that Turkish nationals residing in Germany report a lower satisfaction with different components of medical rehabilitation than Germans. Rehabilitation patients of Former Yugoslavian or South European origin, in contrast, reported similar levels of satisfaction as the majority population.

The lower satisfaction observed in Turkish nationals may be attributable to cultural and religious needs not sufficiently addressed by healthcare providers. Also, a limited German language proficiency may be a significant barrier for communication in rehabilitation and may contribute to a lower satisfaction. This shows that migrants are a very heterogeneous population in terms of their expectations towards rehabilitation and emphasises the need for rehabilitative care institutions to provide services that are sensitive to the diversity of their clients.

One promising approach to deal with the heterogeneity of healthcare users in terms of expectations is diversity management.⁵⁵ Diversity management could also address the fact that levels of healthcare satisfaction differ between migrants and non-migrants and vary between sociodemographic groups such as men and women and older and younger patients.

Contributors PB developed the concept and design of the study, performed the statistical analysis, interpreted the findings and drafted the manuscript. OS assisted in the statistical modeling of the data and in writing the manuscript. YYA and TW helped to interpret the findings. OR helped with the study design and data interpretation and critically revised the manuscript. All authors read and approved the final manuscript.

Funding The study was supported by a grant from the Association for Rehabilitation Research in North RhineWestphalia (Gesellschaft für Rehabilitationswissenschaften NordrheinWestfalen e.V.; GfR 12006) whose support we acknowledge. The publication costs of this article were funded by the German Research Foundation/Deutsche Forschungsgemeinschaft and the Technische Universität Chemnitz in the funding programme Open Access Publishing. The funders had no role in study design, data collection and analysis, decision to publish or preparation of the manuscript.

Competing interests None declared.

Patient consent The results presented in the manuscript are based on routine data from a social security institution that are made available for purposes of secondary data analysis. The survey is voluntary and patients provide a written informed consent for participation. The survey and the use of the data for purposes of secondary data analysis follow the requirements as defined by the German Social Code VI, IX and X. Since the data are fully anonymised, no additional ethical approval for the present analysis was necessary.

Provenance and peer review Not commissioned; externally peer reviewed.

Data sharing statement Data are available from the German Statutory Pension Insurance Scheme for researchers who meet the criteria for access to confidential data.

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