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ORIGINAL ARTICLE

Acculturation and health-related quality of life: results from the German National Cohort migrant feasibility study

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Abstract
Objectives We assessed the association between acculturation and health-related quality of life (HRQoL) among persons with a Turkish migrant background in Germany.
Methods 1226 adults of Turkish origin were recruited in four German cities. Acculturation was assessed using the Frankfurt Acculturation Scale resulting in four groups (integration, assimilation, separation and marginalization). Short Form-8 physical and mental components were used to assess the HRQoL. Associations were analysed with linear regression models.
Results Of the respondents, 20% were classified as integrated, 29% assimilated, 29% separated and 19% as marginalized. Separation was associated with poorer physical and mental health (linear regression coefficient (RC) = −2.3, 95% CI −3.9 to −0.8 and RC = −2.4, 95% CI −4.4 to −0.5, respectively; reference: integration). Marginalization was associated with poorer mental health in descendants of migrants (RC = −6.4, 95% CI −12.0 to −0.8; reference: integration).
Conclusions Separation and marginalization are associated with a poorer HRQoL. Policies should support the integration of migrants, and health promotion interventions should target separated and marginalized migrants to improve their HRQoL.

Keywords Health-related quality of life · Immigrants · Acculturation · Turkey · Germany

Introduction

Migrants are often found to have a lower health status than that of the host population, although some health advantages have also been reported (Brzoska et al. 2015; IOM

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2013). Factors which may explain this health gap between migrant and host population include differential exposures to specific risk factors such as infections that are more common in the country of origin, traumatic experiences during migration, increased occupational strain, discrimination, as well as lower socio-economic resources or genetic predispositions (Spallek et al. 2011). Migrants also face access barriers to health services due to cultural and language differences. In addition, the role of acculturation is increasingly being studied as a potential explanatory factor for health differentials.

Acculturation describes the processes and changes that take place when people from different cultural backgrounds come into permanent contact. Although these changes affect all societal groups, research has generally focused on cultural changes among immigrants who are assumed to be permanently settled in a new country (Schwartz et al. 2010). Social theory suggests that acculturation is conceptually related to three mechanisms of social integration, i.e. integration via shared practices and cognitive schemata (e.g. habits, language skills), integration via social interaction (e.g. social networks, social capital), and integration via identification (e.g. shared values, identities) (Esser 2009). Early models conceptualized acculturation as a unilinear process in which immigrants adopt the behaviours and attitudes of the host society and simultaneously discard their culture of origin, with length of time spent in the new society being the central variable in this process (Gordon 1964). This unilinear process is still the underlying concept of acculturation in many epidemiological studies. The reported findings in terms of health outcomes have been contradictory. Whereas some studies have observed correlations between low levels of acculturation and adverse mental health and impaired social functioning (Jang and Chiriboga 2010; Yang and Wang 2011) as well as lower health-related quality of life (Avis and Colvin 2007), others reported more symptoms of depression and a higher prevalence of adverse health behaviour such as smoking among the more acculturated (Alegria et al. 2008; Lorenzo-Blanco and Cortina 2013; Reiss et al. 2015).

Recent concepts of acculturation have recognized that receiving-culture acquisition and heritage-culture retention are independent dimensions of acculturation. A bilinear model with the following four categories has hence been proposed: integration (adopting culture of the host society while retaining some of heritage culture), assimilation (adopting the new society's culture and discarding the heritage culture), separation (retaining the heritage culture and not adopting the culture of the host society), and marginalization (rejecting both the heritage and host society culture) (Berry 1980, 2005). With regard to health, Berry's model suggests that integration is associated with the least and marginalization with the most acculturative stress (thus poorer health), while assimilation and separation are positioned between the two groups (Berry 2005). The acculturation concept has been criticized for its psychological orientation that suggests a level of individual choice ('acculturation strategies'), while ignoring contextual and other social factors (Viruell-Fuentes et al. 2012). It has also been criticized for its lack of in-depth cultural analysis and, as a consequence, a tendency towards stereotyping and ethnocentrism (Guarnaccia and Hausmann-Stabile 2016; Hunt et al. 2004). In addition, there are doubts that Berry's four acculturation categories are appropriately characterizing all migrant groups (Rudmin 2003) and the validity of marginalization as an acculturation category has been questioned (Schwartz et al. 2010). Nevertheless, even critics suggest that bilinear acculturation measures show better psychometric properties compared to unilinear ones (Rudmin 2009). This was also demonstrated by Yoon et al. (2013) in their meta-analysis in which they compared findings of studies using unilinear versus those using bilinear measures. Their findings indicated that associations with mental health were observed only when bilinear measures of acculturation were used. Furthermore, it should be noted that Berry indeed related his acculturation model to concepts of psychosocial stress and societal conflicts, taking inter-ethnic relations and exposures such as discrimination as central drivers of the acculturation process into account (Berry 2005).

However, to date most research on acculturation derives from the United States and Berry's model has yet to be applied to other contexts and countries. On the understanding that acculturation is a bilinear process related to psychosocial stress and mechanisms of social integration, we assessed the association between acculturation and health-related quality of life (HRQoL) in a sample of persons of Turkish origin residing in Germany. HRQoL encompasses perceptions of physical and mental health which form a relevant part of an individual's quality of life, i.e. her or his position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns (WHO 1997). Thus, HRQoL refers to the concept of health as a state of well-being not the absence of disease. It has become an important measure for the surveillance of population health and can be used to identify health disparities among population subgroups.

Persons with a Turkish background (2.86 million) formed the largest single-country group of the 16.4 million persons with a migrant background residing in Germany in 2014 (Statistisches Bundesamt 2015). Whereas the first wave of Turkish migrants came in the context of bilateral labour agreements between West Germany and Turkey in the 1950s and 1960s, immigration pattern shifted from short-term work-based migration towards long-term family

reunification (Bade 1992; Morawa and Erim 2014). Currently, only 48% of the 2.86 million persons with a Turkish migrant background immigrated themselves and 52% are descendants of migrants (Statistisches Bundesamt 2015). The association between acculturation status and HRQoL may vary by migration-related variables and socio-demographic characteristics. For example, age at migration (including being born in the host country) indicates the life stage when the acculturation process started. Depending on where the primary socialization took place, people may find it more or less stressful to integrate or assimilate. Differences in gender roles between the country of origin and the host country may also play a role (Yoon et al. 2010). For instance, assimilation into the host culture may bring about family conflict for women when more traditional gender roles are expected in the culture of origin. Thus, in this study we aimed to assess the association between acculturation and HRQoL and to explore the heterogeneity of this association across gender and age of migration.

Method

Study design and setting

The data for this study were collected within the context of the German National Cohort (GNC) in a feasibility study for enrolling persons with a migrant background. The GNC is a prospective cohort study aiming to include 200,000 persons across Germany. As migrants are often underrepresented in epidemiological studies (Ranganathan and Bhopal 2006; Reiss et al. 2013), the aim of this feasibility study was to assess different sampling strategies among persons with a Turkish migrant background and ethnic German immigrants from the former Soviet Union, the largest migrant groups in Germany. The recruitment centres were located in the cities of Essen, Berlin, Heidelberg, and Ludwigshafen. All centres applied a community-based (self-referred) and a register-based (random) approach. The recruitment started in 2011 and lasted 16 months. A more detailed description of the sampling strategies has been provided by Reiss et al. (2014).

Individuals who were willing to participate underwent a medical examination and completed a self-administered questionnaire. All questionnaires were available in German, Russian, and Turkish. Participation rates for the register-based sample ranged from 10.1 to 20.0% (Reiss et al. 2014). The study was approved by the respective ethical committees of all four recruitment centres. Migrants from the former Soviet Union were however recruited in only one city (Heidelberg) and the number of participants recruited was small ($n=59$). Consequently, we excluded this group of migrants from the analysis.

Health-related quality of life

We used the Short Form-8 health survey (SF-8), the shortest version of the SF-36, to assess HRQoL (Ware et al. 2001). The instrument contains eight items covering different aspects of physical and mental health, such as physical functioning, bodily pain, social functioning, and emotional role. Single items were weighted and transformed into a physical component summary score (PCS) and a mental component summary score (MCS). Parameters used for the transformation were derived from a US reference population, as described in Ware et al. (2001). The summary scores were standardized T-scores (mean [M] = 50 and standard deviation [SD] = 10 in the reference population). Sound psychometric properties of SF-8 have been reported, showing parallel test reliability with SF-36 for PCS ($r=0.88$) and MCS ($r=0.82$) (Ware et al. 2001). The validity of the SF-8 has not been tested in a Turkish sample. Internal consistency (Cronbach's alpha) in our sample was $\alpha=0.90$.

Acculturation

The Frankfurt Acculturation Scale (FRACC) was used to assess the acculturation status (Bongard et al. 2002). The scale has two subscales: orientation towards the culture of origin (CO) and orientation towards the host culture (HC). Each additive subscale includes ten items rated on a seven point Likert-like scale (0 = absolutely not, 6 = absolutely). The items refer to the three mechanisms of social integration: cultural practices (e.g. "German traditions are part of my life", "In my leisure time I prefer to talk in my mother tongue"), inter-ethnic social networks (e.g. "If I have a problem, I rather talk to people from my country of origin"), and cultural identification (e.g. "I rather feel like a German"). The possible range for the two subscales was 0–60, with higher values indicating a stronger orientation towards CO and HC, respectively. Cronbach's alpha was acceptable, with $\alpha=0.82$ for CO and $\alpha=0.77$ for HC.

The median of the subscales was used as a cut-off to categorize subjects as having a higher or lower orientation towards CO and HC, respectively. The two subscales were then combined and transformed into the four acculturation groups as proposed by Berry (2005): integration (CO+, HC+), assimilation (CO−, HC+), separation (CO+, HC−), and marginalization (CO−, HC−). Cases without valid responses to any of the FRACC items (unit nonresponse) were categorized as missing. Values for item nonresponse were imputed using the expectation maximization (EM) algorithm (Dempster et al. 1977).

Migration-related covariates

Age at migration and religiousness were included as migration-related covariates. We chose age at migration instead of length of residence in Germany because it has a clearer conceptual link to acculturation as it puts a stronger emphasis on how much of the primary socialization process, the basis for all further socialization, took place in Turkey or Germany. Furthermore, length of residence is highly correlated with a person's age, and it may be confounded with belonging to a certain historical cohort of migrants. Age at migration was categorized into five groups (0 = born in Germany, 1 = 0–5 years old at migration, 2 = 6–17 years, 3 = 18–35 years, 4 = >35 years). Religiousness was assessed with a single item ("Would you call yourself religious?", 0 = no, 1 = yes). Self-rated German language proficiency was also assessed in the questionnaire but not used as a covariate as it closely correlated with the FRACC scores.

Socio-demographic covariates

Participants' age was categorized into five groups: 18–29, 30–39, 40–49, 50–59, and 60–71 years.

Socio-economic position (SEP) was measured as a composite index including information on education, occupational status, and income, as proposed by the German Health Interview and Examination Survey study group (Lampert et al. 2013). A summary score was computed and then categorized into three groups (low = lowest quintile in the general population in Germany, medium = 2nd to 3rd quintile, high = 4th to highest quintile). We are aware of the critique concerning the use of composite SEP indicators (Galobardes et al. 2006), but we found stronger association between HRQoL and SES for the composite indicator than for the single indicator. Furthermore, using a composite indicator allowed us to impute missing values in one subscale based on the available information in the other subscales.

Analysis

Frequency distributions were used to describe sample characteristics overall and for each acculturation group. Linear regression was used to assess the associations between HRQoL and acculturation group in crude and in adjusted models (age, gender, and SEP). In addition, stratified analyses were conducted to explore heterogeneity of the association across gender and age at migration (born in Germany, immigrated in childhood or adolescence, immigrated in adulthood). Imputation of missing values (EM algorithm) was carried out in SPSS 23 (SPSS Inc., IL, USA). Single missing items on the FRACC scale were imputed from the available information in other items ($n = 286$); cases without any valid response to a FRACC item were not imputed ($n = 45$). All other analyses were performed using STATA 12 (STATA Corp. TX, USA).

Results

Basic characteristics

A total of 1226 participants with a mean age of 42 years (range: 18 to 71) were included in this study, 60% of whom were women (Table 1). Almost half of the participants had a low SEP, and less than a fifth were in the high SEP category. Most of the participants came to Germany as young adults and about a fifth were descendants of Turkish immigrants, i.e. they were born in Germany. More than half of the participants described themselves as being religious. Self-rated German language proficiency varied, with about a fifth reporting very good proficiency and a further fifth low proficiency. Based on the FRACC ratings, 20% were classified as integrated, 29% were in the assimilation group, another 29% in the separation group, and 19% in the marginalization group. A grouping was not possible for 4% of the participants due to missing information (unit nonresponse).

Socio-demographic and migration-related characteristics varied across the acculturation groups. The proportion of males was higher in the assimilated than the other groups. Further, the assimilated group had larger proportions of younger age groups than the separated and the marginalized groups. The proportion of participants with a low SEP was highest in the separated group and lowest among the assimilated. While the majority of those in the separated group migrated to Germany when they were adults, the largest proportion among the assimilated was born in Germany. Being religious was also more common among the separated than in the other groups. German language proficiency varied across the groups, with ratings being higher among the integrated and assimilated (Table 1).

HRQoL and acculturation

Separation was significantly associated with lower physical component summary (PCS) and mental component summary (MCS) scores compared to integration. The association between marginalization and the MCS score was statistically significant in the crude analysis and only slightly weaker in the adjusted model (Table 2). The included variables for adjustment showed associations with HRQoL in the expected direction. A higher SEP was associated with better PCS and MCS scores. Males had higher scores for both PCS and MCS compared to females. PCS declined

Table 1 Sample characteristics (overall and stratified by acculturation groups; German National Cohort feasibility study 2011/2012, Germany)

Variable	Overall	Acculturation groups				
	$N=1226$	Integration ($n=242$, 19.7%)	Assimilation ($n=361$, 29.4%)	Separation ($n=350$, 28.5%)	Marginalization ($n=228$, 18.6%)	Missing ($n=45$, 3.7%)
Age groups (*n*, %)						
18–29	196 (16.0)	44 (18.2)	93 (25.8)	33 (9.4)	24 (10.5)	2 (4.4)
30–39	329 (26.8)	69 (28.5)	112 (31.0)	86 (24.6)	49 (21.5)	13 (28.9)
40–49	378 (30.8)	72 (29.8)	99 (27.4)	115 (32.9)	83 (36.4)	9 (20.0)
50–59	188 (15.3)	35 (14.4)	39 (10.8)	60 (17.1)	44 (19.3)	10 (22.2)
60–71	135 (11.0)	22 (9.0)	18 (5.0)	56 (16.0)	28 (12.3)	11 (24.4)
Gender (*n*, %)						
Female	738 (60.2)	147 (60.7)	195 (54.0)	222 (63.4)	140 (61.4)	34 (75.6)
Male	488 (39.8)	95 (39.3)	166 (46.0)	128 (36.6)	88 (38.6)	11 (24.4)
Socio-economic position (*n*, %)						
Low	589 (48.0)	109 (45.0)	124 (34.4)	201 (57.4)	128 (56.1)	27 (60.0)
Medium	469 (38.3)	93 (38.4)	160 (44.3)	121 (34.6)	77 (33.8)	18 (40.0)
High	168 (13.7)	40 (16.5)	77 (21.3)	28 (8.0)	23 (10.1)	0 (0.0)
Health-related quality of life (*M*, SD)[a]						
PCS	45.8 (9.9)	47.1 (9.3)	47.6 (9.9)	43.4 (9.9)	45.7 (9.0)	41.8 (11.4)
MCS	45.3 (11.4)	46.7 (10.8)	46.5 (11.4)	43.6 (11.4)	44.3 (11.8)	43.7 (13.0)
Age at migration (*n*, %)						
Born in Germany	248 (20.2)	54 (22.3)	143 (39.6)	22 (6.3)	27 (11.8)	2 (4.4)
0–5 years	70 (5.7)	11 (4.6)	44 (12.2)	5 (1.4)	9 (4.0)	1 (2.2)
6–17 years	287 (23.4)	66 (27.3)	72 (19.9)	87 (24.9)	55 (24.1)	7 (15.6)
18–34 years	497 (40.5)	99 (40.9)	77 (21.3)	200 (57.1)	107 (46.9)	14 (31.1)
≥35 years	31 (2.5)	5 (2.1)	4 (1.1)	17 (4.9)	5 (2.2)	0 (0.0)
Missing	93 (7.3)	7 (2.9)	21 (5.8)	19 (5.4)	25 (11.0)	21 (46.7)
Religiousness (*n*, %)						
No	380 (31.0)	75 (31.0)	155 (42.9)	81 (23.1)	67 (29.4)	2 (4.4)
Yes	700 (57.1)	154 (63.6)	168 (46.5)	251 (71.7)	118 (51.8)	9 (20.0)
Missing	146 (11.9)	13 (5.4)	38 (10.5)	18 (5.1)	43 (18.9)	34 (75.6)
German language proficiency (*n*, %)						
Very good	253 (20.6)	52 (21.5)	163 (45.2)	14 (4.0)	23 (10.1)	1 (2.2)
Good	313 (25.5)	81 (33.5)	122 (33.8)	56 (16.0)	51 (22.4)	3 (6.7)
Medium	395 (32.2)	78 (32.2)	64 (17.7)	144 (41.1)	93 (40.8)	16 (35.6)
Poor	219 (17.9)	25 (10.3)	9 (2.5)	125 (35.7)	48 (21.1)	12 (26.7)
Missing	46 (3.8)	6 (2.5)	3 (0.8)	11 (3.1)	13 (5.7)	13 (28.9)

M mean, *SD* standard deviation, *PCS* physical component summary score, *MCS* mental component summary score

[a]Valid cases $n=1081$

with age, while MCS was not significantly associated with age.

Stratified analyses showed only small differences between males and females. While the negative association between separation and PCS was marginally stronger in females, the negative association with MCS was stronger in males. However, average MCS scores were higher in males than in females (Supplementary Tables S1, S2). With regard to age at migration, the stratified analysis indicated a significant negative association of marginalization with MCS among those born in Germany (adjusted linear regression coefficient (RC) = −6.2, 95% CI −11.8 to −0.6; Supplementary Table S3), but not among those who immigrated themselves (Supplementary Tables S4, S5). Separation was, however, primarily associated with lower PCS and MCS scores among those who immigrated in adulthood (PCS: adjusted RC = −3.9,

Table 2 Crude and adjusted association between acculturation and health-related quality of life (physical health component and mental health component; multiple linear regressions; German National Cohort feasibility study 2011/2012, Germany)

	Physical health component		Mental health component	
	Crude	Adjusted	Crude	Adjusted
	Regression coefficient (95% CI)	Regression coefficient (95% CI)	Regression coefficient (95% CI)	Regression coefficient (95% CI)
Constant	47.1 (45.8, 48.4)	48.2 (46.4, 50.1)	46.7 (45.2, 48.2)	43.3 (41.1, 45.6)
Acculturation group				
Integration	Ref	Ref	Ref	Ref
Assimilation	0.4 (−1.2, 2.1)	−0.9 (−2.4, 0.7)	−0.2 (−2.1, 1.7)	−0.8 (−2.7, 1.1)
Separation	−3.7 (−5.4, −2.1)***	−2.3 (−3.9, −0.8)**	−3.1 (−5.1, −1.1)**	−2.4 (−4.4, −0.5)*
Marginalization	−1.4 (−3.3, 0.4)	−0.5 (−2.3, 1.3)	−2.4 (−4.6, −0.2)*	−2.0 (−4.2, 0.1)
Age groups				
18–29	–	Ref	–	Ref
30–39	–	−3.7 (−5.4, −2.0)***	–	−0.1 (−2.2, 1.9)
40–49	–	−5.8 (−7.4, −4.1)***	–	0.0 (−2.0, 2.0)
50–59	–	−6.7 (−8.7, −4.7)***	–	−0.8 (−3.2, 1.7)
60–71	–	−7.3 (−9.6, −5.0)***	–	1.4 (−1.4, 4.3)
Sex				
Female	–	Ref	–	Ref
Male	–	2.9 (1.7, 4.0)***	–	3.8 (2.5, 5.2)***
Socio-economic position				
Low	–	Ref	–	Ref
Medium	–	3.1 (1.9, 4.4)***	–	2.2 (0.7, 3.8)**
High	–	5.4 (3.7, 7.1)**	–	5.9 (3.8, 7.9)***

*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$

95% CI −6.2 to −1.6; MCS: adjusted RC = −3.2, 95% CI −5.9 to −0.6; Supplementary Table S3).

Discussion

In this study, we applied Berry's bilinear concept of acculturation to a sample of persons of Turkish origin residing in Germany and explored associations between acculturation and HRQoL. Average physical and mental component summary scores in our sample were approximately half a standard deviation below the scores obtained in general population health surveys in Germany (Ellert et al. 2005). To some extent, this supports the assumption that this group has a poorer self-assessed health than the general population.

The four acculturation groups in our sample differed regarding socio-demographic and migration-related characteristics. On average, SEP was lower among the separated and the marginalized and a higher proportion of the assimilated was born in Germany.

Interpretation of main findings

Theoretical concepts of acculturation indicate that not adopting the behaviours and attitudes of the host society may negatively affect the well-being of a person due to a lower level of integration into society and more stressful social interaction in everyday life. Specifically, Berry suggested that marginalization is associated with the highest burden of acculturative stress (Berry 2005). We found that separation was associated with a lower HRQoL in both physical and mental health component scores. Marginalization on the other hand was not related to physical health components of HRQoL. Although the association of marginalization with MCS was significant in the crude analysis, it was close to significance after controlling for age, gender, and SEP.

While our results generally support that acculturation is related to HRQoL, we found that separation was more consistently related to negative physical and mental health components of quality of life compared to marginalization. A methodological reason for this may be the poorer reliability and validity of the marginalized group compared to

the other three groups, which has been indicated by other studies (Schwartz et al. 2010).

The studies on the relationship between acculturation and HRQoL that we found in the literature mostly provided inconsistent results (Avis and Colvin 2007; Kim et al. 2006; Yang and Wang 2011). However, these studies applied unilinear concepts of acculturation. In a meta-analysis based on studies from North America, Yoon et al. (2013) were able to show that acculturation status was associated with diverse measures of mental health when a bilinear concept of acculturation was used. In a study conducted in Germany, an association between acculturation and depressive symptoms was found among mental health patients with a Turkish migrant background (Morawa and Erim 2014).

Although we were not able to analyse the pathways of how acculturation is related to HRQoL in our study, we presume that psychosocial stress and experiences of discrimination may play a central role. From the history of Turkish migration in Germany, it can be concluded that the societal climate towards this group was not very supportive. The so-called guest workers, mainly unskilled labourers from rural areas, were expected to return to Turkey after a few years. Instead, many of them stayed and their families subsequently migrated to Germany. This shift from temporal to permanent migration was ignored for a long time by the German authorities and society at large, and thus insufficient measures were taken to support the integration of this population group as well as to avoid segregation (Bade 1992). Apart from psychosocial stress, lower social capital because of a smaller or less resourceful social network may also affect the HRQoL among the separated and marginalized. Furthermore, access to health services may be a relevant factor (Brzoska et al. 2010). The separated and marginalized may experience greater difficulties to access and navigate through the healthcare system due to lower German language skills.

In terms of gender differences, we assumed that assimilation may have a negative impact on HRQoL among women as it may go along with family conflict. While the proportion of women in the assimilated group was smaller and their overall levels of HRQoL were lower, the stratified analysis did not show a negative association for assimilation among women or other major differences compared to men.

For the exploration of age at migration as a potential moderator, we assumed that among persons who immigrated in adulthood, retaining the culture of origin may have a stronger influence on personal well-being, and adopting the host culture may be more stressful. However, we found that separation was consistently related to lower HRQoL in this subgroup and no negative association was observed for assimilation. What we found instead was that the negative association of marginalization with MCS was particularly strong among those who were born in Germany. Higher personal and societal expectations towards integration and, consequently, a higher degree of frustration when this expectation is not met, may be a reason for this stronger association. While descendants of migrants generally acquire the host culture more easily, strongly resisting the host culture (reactive ethnicity) has been described as a mechanism if descendants of migrants experience discrimination and hostility (Rumbaut 2008). Because of the explorative nature of our subgroup analysis, more research on this specific subgroup is however needed.

Strengths and limitations

To our knowledge, this is the first study to analyse the association between acculturation and health in a large population sample in the German context, using Berry's acculturation concept. The sample we analysed was quite diverse in terms of socio-demographic background and migration-related aspects, and allowed stratification for gender and age at migration.

There are nonetheless several limitations to this study. A general limitation is that the study is cross-sectional; thus, it is not possible to draw causal conclusions or to determine the direction of the associations. Berry's model suggests that acculturation influences HRQoL, but it could also be that a poor HRQoL affects the acculturation process. Another limitation is that the sample comprised only Turkish migrants. As every country and every migrant group in a country have their unique history of migration, the results cannot be generalized to other migrant groups. A methodological limitation is that the classification of the survey participants into the four acculturation groups was based on the distribution in the FRACC subscales (median split), and thus there was no absolute criterion for assigning the participants to one of the groups (Schwartz et al. 2010). Therefore, the proportions in the acculturation groups should not be interpreted in absolute terms. Further, the concept of acculturation has been criticized for focusing on psychological aspects and thereby neglecting structural and contextual factors such as the attitudes and immigration policies in the host society (Rudmin 2003; Schwartz et al. 2010; Viruell-Fuentes et al. 2012). Although Berry has in fact added contextual factors to his theory (Berry 2005), we had no indicators for contextual factors, e.g. perceived discrimination, in our study.

Conclusion

This study demonstrates that acculturation status is related to HRQoL in a sample of participants of Turkish origin living in Germany. Compared to integration, separation and marginalization are associated with less favourable

HRQoL. Apart from the many other factors that influence migrant health, acculturation status seems to be a useful concept to analyse health differentials within and across migrant groups. A balance between retaining the culture of origin and openness to adopt the culture of the host country appears to be associated with a better HRQoL. The cross-sectional study design however does not allow the determination of the direction of the association. Nevertheless, on a general level the bilinear acculturation model suggests that the host society should encourage and support immigrants to adopt the new culture while retaining their culture of origin. Besides policies to support the integration of migrants, separated and marginalized migrants should be involved in the design and implementation of interventions aimed at improving their quality of life. Future research should also analyse the effects of context of reception and immigration policies on acculturation and migrant health and further analyse the mechanisms that link acculturation to HRQoL. The recent influx of refugees and other immigrants in Europe highlights the fact that migrant health and socio-cultural integration will remain on the European agenda for a long time to come.

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Compliance with ethical standards

Conflict of interest The authors declare that they have no conflict of interest.

Ethical approval This study was approved by the respective ethical committees of all four recruitment centres.

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