

BMJ Open Association between purpose in life and healthcare use among women and men in Germany: cross-sectional analysis of the nationally representative German Socio-Economic Panel (GSOEP) study

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To cite: Hajek A, König H-H. Association between purpose in life and healthcare use among women and men in Germany: cross-sectional analysis of the nationally representative German Socio-Economic Panel (GSOEP) study. *BMJ Open* 2022;**12**:e061525. doi:10.1136/bmjopen-2022-061525

► Prepublication history and additional supplemental material for this paper are available online. To view these files, please visit the journal online (<http://dx.doi.org/10.1136/bmjopen-2022-061525>).

Received 28 January 2022
Accepted 06 June 2022



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ABSTRACT

Objectives It remains almost unknown whether purpose in life is associated with healthcare use (HCU) in general. Therefore, the goal of this study was to examine the association between purpose in life and HCU (in terms of frequency of outpatient physician visits and hospitalisation) stratified by sex.

Design Cross-sectional study.

Setting and participants A representative sample of the general adult population in Germany (n=1238; collected from September 2020 to February 2021); taken from the innovation sample of the German Socio-Economic Panel.

Outcome measures The frequency of outpatient physician visits in the past 3 months was used as first outcome measure. Hospitalisation in the last 12 months was used as the second outcome measure. Purpose in life was quantified by means of the subscale ‘purpose in life’ of the six-factor model of psychological well-being. Covariates were selected based on the Andersen model. **Results** Average purpose in life equaled 4.5 (SD: 0.8; ranging on a scale from 1 to 6, with higher values indicating higher purpose in life). Adjusting for various potential confounders, regressions revealed that higher purpose in life was associated with an increased frequency of outpatient physician visits in the past 3 months among women (IRR 1.16, 95% CI: 1.03 to 1.30), but not men (IRR 0.96, 95% CI 0.87 to 1.07). In contrast, higher purpose in life was associated with an increased likelihood of hospitalisation among men (OR 1.40, 95% CI 1.02 to 1.93), but not women (OR 1.03, 95% CI 0.79 to 1.34).

Conclusion Even after adjusting for various potential confounders, there was still a gender-specific association between higher purpose in life and increased HCU. This knowledge may assist in addressing individuals at risk for underuse or overuse of healthcare services.

INTRODUCTION

Healthcare use (HCU) mainly covers outpatient physician visits and hospital stays. To manage HCU, knowledge about the correlates is of great importance. Various studies examined the correlates of HCU based on Andersen’s behavioural model.^{1,2} This model divides

STRENGTHS AND LIMITATIONS OF THIS STUDY

- ⇒ Data from a nationally representative sample.
- ⇒ Established purpose-in-life subscale of the six-factor model of psychological well-being was used to quantify purpose in life.
- ⇒ Possibility of a recall bias cannot be dismissed.
- ⇒ Findings of this cross-sectional study should be confirmed based on longitudinal data.

the correlates into predisposing characteristics like sex age, enabling factors like income and need factors such as physical illnesses or self-rated health. A former review showed that particularly need factors drive HCU.¹

Even after adjusting for the factors included in the Andersen model, previous studies have demonstrated that psychosocial factors or personality-related factors are important for HCU.^{3–6} Nevertheless, the association between purpose in life and HCU remains largely unexplored. Purpose in life refers to a sense of goals, aims, as well as direction in life.⁷ Using longitudinal data (tracked for 6 years) from the Health and Retirement Study (American adults aged 50 years and over), Kim *et al*,⁸ for example, demonstrated that purpose in life is positively associated with the use of various preventive healthcare services in the USA. This can possibly be explained by the health-conscious behaviour of individuals who score high in purpose in life. Moreover, Kim *et al* showed that purpose in life is associated with the number of nights spent in the hospital over time (6-year follow-up). However, the study conducted by Kim *et al*⁸ concentrated on *preventive* healthcare services and hospitalisation, whereas it remains unknown whether purpose in life is associated with outpatient physician visits in general. Another difference is that our study

will examine the association between purpose of life and HCU in Germany—which, for example, differs in terms of access to healthcare services from the US healthcare system (please see below for further details regarding the German healthcare system). Therefore, the aim of this study is to clarify whether purpose in life is associated with HCU more broadly (covering outpatient physician visits and hospitalisation) in the general adult population (stratified by sex) in Germany. In our current study, sex-stratified regressions will be conducted since—as previously shown^{1 5}—the association between independent variables and HCU may vary depending on sex. This may be explained by some underlying factors such as social factors, economic situation or different coping strategies.⁹

Regarding possible mechanisms, it is plausible that when individuals do not perceive their life as purposeful, they may tend to avoid investments in their health and consequently may report, for example, infrequent physician visits. For example, they may underuse healthcare services. It is important to know about such a link because it may assist in addressing individuals at risk for infrequent doctor visits. In turn, this is of importance because purpose in life can be modified.^{10 11} Furthermore, underuse of HCU may increase morbidity and mortality in the long term.

Regarding the healthcare system in Germany, health insurance is compulsory. The great majority (about 90% of the population) is enrolled in the statutory health insurance (SHI), whereas the remaining 10% are enrolled in the private health insurance (PHI). Particularly the following groups can choose between SHI and PHI: Civil servants, self-employed individuals (eg, freelancers) and individuals exceeding a certain income-threshold. Both insurance systems provide comprehensive protection against healthcare expenses. Furthermore, access to general practitioners and specialists is guaranteed (without further requirements), whereas hospital care can be used with referral from an outpatient physician or in case of an emergency. Busse and Riesberg provided additional details regarding the German healthcare system.¹²

METHODS

Sample

For our cross-sectional study, observational data were used from the nationally representative German Socio-Economic Panel (GSOEP), located at the German Institute for Economic Research, DIW Berlin. The GSOEP began in 1984. It is a well-known and widely used ongoing household panel study. Since 2003, the GSOEP is funded by the Federal Ministry of Education and Research and the governments of the federal states.

Annually, about 11 000 households (including more than 20 000 individuals) participated in the interviews. Every household member aged 16 and above filled out the adult questionnaire. Thus, apart from age, exclusion criteria do not exist for the adult questionnaire.

The GSOEP includes various topics such as labour force participation, health or psychological characteristics. High response¹³ and low attrition rates¹⁴ have been documented. Further details have been provided elsewhere in references.^{15 16}

Regarding the innovative sample from the GSOEP (GSOEP-IS), key features of the sample design and fieldwork procedures are in accordance with the SOEP-core samples.¹⁷ The fieldwork is conducted by the widely-acknowledged institute Kantar Public Germany. The different subsamples are based on different target populations (eg, refreshment sample E or high income sample G). Different random sampling techniques were used (often: multistage random samples with regional clusters). The respondent's households are selected by using the random-walk technique. Please see Kara and Zimmermann for further details.¹⁸

In the study, Germans living in former East Germany and in West Germany are included. Moreover, it includes foreign nationals living in Germany, refugees and recent immigrants. Further details are provided by Glemser and Rathje.¹⁹

The key independent variable (purpose in life) was solely quantified in the GSOEP-IS in the most recent wave (year 2020). Analogous to the GSOEP, the GSOEP-IS is a representative sample including the community-dwelling adult population in Germany.²⁰ Since we examined the association between purpose in life and HCU, data were exclusively taken from this most recent GSOEP-IS. The overall response rate was 85.2% in 2020.¹⁷

The GSOEP-IS included main questions such as socio-demographic factors plus innovative tools which are exclusively developed by the scientific community. In sum, 20 innovative modules were included in this wave. The tools are selected based on a competitive review process. Further details are given elsewhere.²¹

Commonly, the GSOEP-IS is conducted via computer assisted personal interview (CAPI). However, due to the pandemic, respondents and interviews could select whether to perform the interview personally (CAPI) or via telephone.¹⁷ In total, 69.7% were performed via CAPI, 30.1% were conducted via telephone, 0.1% were performed online and 0.1% used another interviewing mode.¹⁷

The GSOEP-IS has been extended continuously (using refresher samples). Several subsamples were included in the year 2020. Please see Zweck for further details.¹⁷ According to Zweck,¹⁷ 3785 individuals were included in the GSOEP-IS wave conducted in the year 2020. Given the restricted interview time and considering different research interests, the participants in the different subsamples were presented different innovative modules. Purpose in life was solely included in two subsamples (more precisely, subsample I2 and subsample, I4). Please see Zweck for further details.¹⁷ In sum, 1259 individuals filled out the key independent variable in this most recent wave (purpose in life). Due to a few missing cases (n=21), our analytical sample equaled n=1238 individuals. Data

were collected from September 2020 to February 2021. In sum, 95.1% of the fieldwork was already completed by the end of December 2020.

Our analytical sample was very similar compared with the GSOEP core study (eg, in our analytical sample, mean age was 55.0 years (SD: 18.1 years), while it was 54.6 years (SD: 15.5 years) in 2019²²). Furthermore, about 54.7% of the individuals were married, living together with spouse in our analytical sample and 56.4% of the individuals reported such a family status in 2019.²³ Moreover, self-rated health, for example, was also comparable (on average, 2.6 in our study compared with 2.5 in 2019).²⁴

Dependent variables

HCU was quantified by means of the number of outpatient physician visits in the last 3 months (ie, continuously assessed) and the hospital treatment in the preceding 12 months (ie, dichotomously assessed). Both variables are self-rated:

- ▶ Frequency of physician visits.
- ▶ Hospital stay for one or more night (0=no; 1=yes).

Independent variables

The key independent variable (purpose in life) was quantified using the 7-item subscale 'purpose in life' of the six-factor model of psychological well-being.²⁵ For example, items are: 'I have a sense of direction and purpose in life.' or 'I enjoy making plans for the future and working to make them a reality.' (in each case: from 1=strongly disagree to 6=strongly agree). We removed one item due to poor reliability ('I sometimes feel as if I've done all there is to do in life'). By averaging the six items, a purpose in life score was calculated. This score ranges from 1 to 6, with higher values indicating higher purpose in life. In our study, Cronbach's alpha was 0.69. However, in an additional analysis, all seven items (Cronbach's alpha was 0.66) were used to, among other things, enable a better comparison to the study conducted by Kim *et al*⁸ and other international studies using this tool.^{26 27}

The covariates were selected using the Andersen model.²⁸ With regard to predisposing characteristics, age and marital status (married; other (single, divorced, widowed) were included. A variable for employment status (not employed; full-time employed; other: regular part-time employed; vocational training; marginally employed; near retirement, zero working hours; military service; community service; sheltered workshop) was also included. With regard to enabling resources, satisfaction with household income (from 0=completely dissatisfied to 10=completely satisfied) and the type of health insurance (PHI vs SHI) were included. Regarding need factors, self-rated health (from 1=very good to 5=bad), the presence of at least one chronic disease (dichotomously assessed: no; yes) and disability ('Are you legally classified as handicapped or capable of gainful employment only to a reduced extent due to medical reasons?' (no; yes)) were included. Moreover, lifestyle factors represent need factors. As, for example, outlined by Klein *et al*,²⁹

lifestyle factors (eg, nutrition, physical activity, alcohol intake or smoking) may be important for HCU. In our study, we included currently smoking (no; yes), alcohol intake (daily; 4–6 days per week; 2–3 days per week; 2–4 days per month; once a month or less often; never), vegetarian or vegan diet (yes, vegetarian; yes, vegan; none of the above; dichotomised into vegetarian/vegan diet or not), and doing sports (daily; at least once a week; at least once a month; less often; never). For example, in accordance with prior research,^{30–32} we assume that a healthy lifestyle (in terms of not smoking, low alcohol intake and a vegetarian/vegan diet) is associated with lower HCU. The assumed association between vegetarian/vegan diet and lower HCU may be explained by, among other things, lower cardiovascular diseases associated with plant-based diets³³ and a health-conscious lifestyle.

Statistical analysis

First, sample characteristics were displayed (stratified by sex). Subsequently, multiple negative binomial regressions with robust standard errors (with frequency of outpatient physician visits as outcome measure^{34–36}) and multiple logistic regressions (with hospitalisation as outcome measure) were used (stratified by sex). Negative binomial regressions were used in the first case due to the distribution of outpatient physician visits. In comparison to Poisson models, negative binomial regressions had smaller Bayesian information criterion (BIC) and Akaike information criterion (AIC) values (among men, Poisson model: AIC=2609.7, BIC=2705.9; negative binomial model: AIC=2283.6, BIC=2384.3; among women, Poisson model: AIC=3544.8, BIC=3643.3; negative binomial model: AIC=2677.6, BIC=2780.6) indicating that the negative binomial model fits our data better. It should be noted that weights were not used as they can negatively influence the estimates in their efficiency.³⁷

The level of significance was set at $\alpha=0.05$. All analyses were performed using Stata 16.1 (StataCorp).

Patient and public involvement

Neither patients nor the public were involved in the development of the methodology for the current study; however, the experiences of community-dwelling adults, as described in the current literature, informed the development of the research question and selection of appropriate outcome measures.

RESULTS

Sample characteristics

Sample characteristics stratified by sex are displayed in [table 1](#) (analytical sample with n=1238 individuals). Average age was 55.0 years (SD: 18.1 years; 17–95 years), with 52.5% being female. The average number of outpatient physician visits in the past 3 months equalled 2.4 (SD: 3.4) in men and 2.8 (SD: 5.9) in women. Average purpose in life score was 4.5 (SD: 0.8) in men and 4.6 (SD: 0.8) in women. About 15% (women: 15.5%) of men had at least

Table 1 Sample characteristics (stratified by sex, n=1238)

	Men (n=588)	Women (n=650)	P value	Total (n=1238)
	Mean (SD)/n (%)	Mean (SD)/n (%)		Mean (SD)/n (%)
No of outpatient physician visits in the past 3 months: mean (SD)	2.4 (3.4)	2.8 (5.9)	0.16	2.6 (4.9)
Hospitalisation in the past 12 months			0.78	
No	500 (85.0)	549 (84.5)		1049 (84.7)
Yes	88 (15.0)	101 (15.5)		189 (15.3)
Purpose in life (6-item version; from 1 to 6, with higher values indicating higher purpose in life)	4.5 (0.8)	4.6 (0.8)	0.24	4.5 (0.8)
Purpose (7-item version; from 1 to 6, with higher values indicating higher purpose in life)	4.6 (0.8)	4.6 (0.8)	0.39	4.6 (0.8)
Age: mean (SD)	54.6 (18.5)	55.3 (17.7)	0.53	55.0 (18.1)
Marital status			<0.05	
Other including single, divorced, widowed	249 (42.3)	312 (48.0)		561 (45.3)
Married	339 (57.7)	338 (52.0)		677 (54.7)
Employment status			<0.001	
Not employed	261 (44.4)	323 (49.7)		584 (47.2)
Other*	64 (10.9)	183 (28.2)		247 (20.0)
Full-time employed	263 (44.7)	144 (22.2)		407 (32.9)
Health insurance			<0.01	
Statutory health insurance	501 (85.2)	589 (90.6)		1090 (88.0)
Private health insurance	87 (14.8)	61 (9.4)		148 (12.0)
Satisfaction with household income (from 0=completely dissatisfied to 10=completely satisfied)	7.2 (2.1)	7.2 (2.1)	0.72	7.2 (2.1)
Currently smoking			0.46	
No	439 (74.7)	497 (76.5)		936 (75.6)
Yes	149 (25.3)	153 (23.5)		302 (24.4)
Alcohol intake			<0.001	
Never	57 (9.7)	144 (22.2)		201 (16.2)
Once a month or less often	122 (20.7)	196 (30.2)		318 (25.7)
2–4 days per month	138 (23.5)	156 (24.0)		294 (23.7)
2–3 days per week	139 (23.6)	98 (15.1)		237 (19.1)
4–6 days per week	61 (10.4)	28 (4.3)		89 (7.2)
Daily	71 (12.1)	28 (4.3)		99 (8.0%)
Vegetarian/vegan diet			<0.001	
No	567 (96.4)	569 (87.5)		1136 (91.8)
Yes	21 (3.6)	81 (12.5)		102 (8.2)
Doing sports			0.38	
Never	182 (31.0)	203 (31.2)		385 (31.1)
Less often	82 (13.9)	81 (12.5)		163 (13.2)
At least once a month	45 (7.7)	34 (5.2)		79 (6.4)
At least once a week	216 (36.7)	255 (39.2)		471 (38.0)
Daily	63 (10.7)	77 (11.8)		140 (11.3)
Self-rated health: mean (SD)	2.6 (0.9)	2.7 (0.9)	0.05	2.6 (0.9)
At least one chronic disease			0.12	
No	327 (55.6)	333 (51.2)		660 (53.3)
Yes	261 (44.4)	317 (48.8)		578 (46.7)
Disability			0.38	
No	481 (81.8)	544 (83.7)		1025 (82.8)
Yes	107 (18.2)	106 (16.3)		213 (17.2)

Continued

Table 1 Continued

	Men (n=588)	Women (n=650)		Total (n=1238)
	Mean (SD)/n (%)	Mean (SD)/n (%)	P value	Mean (SD)/n (%)
*Including: regular part-time employed; vocational training; marginally employed; near retirement, zero working hours; military service; community service; sheltered workshop.				

one hospital visit in the past 12 months. Further details are given in [table 1](#).

Regression analysis

Results of negative binomial regressions are displayed in [table 2](#) (stratified by sex). Frequency of outpatient physician visits in the past 3 months was used as outcome measure. The number of outpatient physician visits was positively associated with purpose in life among women (incidence rate ratio (IRR) 1.16, 95% CI 1.03 to 1.30), but not among men. This, for example, can be interpreted as follows: Given the other factors are held constant in the model, if a woman was to increase her purpose in life by one point, her rate for outpatient physician visits would be expected to increase by a factor of 1.16.

A higher number of outpatient physician visits was associated with never drinking alcohol, worse self-rated health and employment status (with opposite signs) among both women and men.

Results of logistic regressions are displayed in [table 3](#) (stratified by sex). Hospitalisation in the past 12 months was used as outcome measure. The likelihood of hospitalisation was positively associated with purpose in life in men (OR 1.40, 95% CI 1.02 to 1.93), but not in women. Furthermore, the likelihood of hospitalisation was positively associated with worse self-rated health among both women and men.

In a sensitivity analysis, it was also adjusted for the interview month to capture certain time effects during the pandemic. However, the main associations remained nearly the same. In further detail, the association between purpose in life and outpatient physician visits was virtually the same in women (IRR 1.19, 95% CI 1.06 to 1.33). Moreover, purpose in life was marginally positively associated with the likelihood of hospitalisation in men (OR 1.35, 95% CI 0.98 to 1.86).

In a further sensitivity analysis, the seven-item version of the purpose in life tool was used. In sum, the results remained nearly the same. More precisely, the association between purpose in life and outpatient physician visits was virtually the same in women (IRR 1.16, 95% CI 1.04 to 1.30). Moreover, purpose in life was positively associated with the likelihood of hospitalisation in men (OR 1.42, 95% CI 1.03 to 1.97) (see online supplemental tables 1 and 2 for further details).

DISCUSSION

The goal of this study was to examine the association between purpose in life and HCU (in terms of frequency of outpatient physician visits and hospitalisation)

stratified by sex. A quite high average purpose in life was reported by both women and men. Adjusting for various potential confounders, regressions revealed that higher purpose in life was associated with an increased frequency of outpatient physician visits in the past 3 months among women, but not men. In contrast, higher purpose in life was associated with an increased likelihood of hospitalisation among men, but not women.

To better understand the pandemic condition in Germany while data collection (September 2020 to February 2021), a short description may be helpful: While the infection rate was rather low in Germany in September 2020, this rate markedly increased in Mid-October 2020. Thus, contact restrictions and closures (eg, theatres or restaurants) were imposed in early November 2020. These restrictions were further tightened (eg, school closings) in mid-December 2020 and lasted beyond February 2021.

While our study showed that higher purpose in life was associated with an increased frequency of outpatient physician visits solely among women, higher purpose in life was associated with an increased likelihood of hospitalisation solely among men. These sex-specific results are worth explaining.

Women scoring high in purpose in life may also particularly use preventive healthcare services more often than men (also during the pandemic)—as previously shown by three studies based on data from the general adult population in Germany during the COVID-19 pandemic.^{38–40} This may explain why purpose in life was only associated with an increased frequency of outpatient physician visits among women. The link between purpose in life and an increased frequency of outpatient physician visits may be particularly explained by health-conscious behaviour among women who score high in purpose in life. Thus, our findings are possibly in accordance with the findings made by Kim *et al* who investigated the association between purpose in life and use of preventive healthcare services using data from the USA.⁸

The association between increased purpose in life and an increased likelihood of hospitalisation among men may be explained by the fact that (male) individuals who score high in purpose in life tend to feel that there is meaning to present life and a sense of directedness. Furthermore, these individuals tend to have aims and objectives for living. These (rather positive) feelings and thoughts regarding one's own life may outweigh (rather negative) feelings such as general fear of hospital treatment or, more specific, fear of COVID-19. The latter feelings (eg, fear of COVID-19) could contribute to avoidance of hospital visits despite the presence of serious health

Table 2 Determinants of the number of outpatient physician visits in the past 3 months stratified by sex—findings of negative binomial regressions

Independent variables	No of outpatient physician visits—men	No of outpatient physician visits—women
Purpose in life (from 1 to 6, with higher values indicating higher purpose in life)	0.96 (0.87 to 1.07)	1.16* (1.03 to 1.30)
Age	1.01** (1.00 to 1.02)	0.99 (0.99 to 1.00)
Marital status: married (Ref.: other including single, divorced, widowed)	0.95 (0.78 to 1.16)	1.08 (0.89 to 1.30)
Employment status: full-time employed	1.09 (0.86 to 1.37)	0.89 (0.66 to 1.20)
Other†	1.46* (1.06 to 2.00)	0.68** (0.53 to 0.88)
Health insurance: private health insurance (Ref.: statutory health insurance)	1.00 (0.80 to 1.25)	1.28 (0.87 to 1.89)
Satisfaction with household income (from 0=completely dissatisfied to 10=completely satisfied)	1.01 (0.96 to 1.07)	1.00 (0.96 to 1.05)
Currently smoking: yes (Ref.: No)	0.91 (0.73 to 1.13)	0.89 (0.69 to 1.13)
Alcohol intake: once a month or less often (Ref.: never)	0.58* (0.38 to 0.90)	0.63** (0.47 to 0.84)
2–4 days per month	0.56** (0.36 to 0.87)	0.58** (0.41 to 0.82)
2–3 days per week	0.56** (0.37 to 0.85)	0.54*** (0.38 to 0.76)
4–6 days per week	0.60* (0.37 to 0.96)	0.48** (0.29 to 0.80)
Daily	0.44*** (0.29 to 0.68)	0.48** (0.30 to 0.76)
Vegetarian/vegan diet: Yes (Ref.: No)	1.39+ (0.95 to 2.04)	0.90 (0.68 to 1.19)
Doing sports: Less often (Ref.: Never)	1.05 (0.79 to 1.41)	1.06 (0.71 to 1.57)
At least once a month	1.36 (0.93 to 1.99)	0.90 (0.58 to 1.40)
At least once a week	1.17 (0.94 to 1.46)	1.29+ (0.98 to 1.69)
Daily	1.13 (0.79 to 1.61)	1.08 (0.80 to 1.47)
Self-rated health (from 1=very good to 5=bad)	1.53*** (1.35 to 1.74)	1.54*** (1.35 to 1.74)
At least one chronic disease: Yes (Ref.: No)	1.17 (0.94 to 1.44)	1.26+ (0.96 to 1.65)
Disability: Yes (Ref.: No)	1.17	1.09

Continued

Table 2 Continued

Independent variables	No of outpatient physician visits—men	No of outpatient physician visits—women
	(0.94 to 1.45)	(0.87 to 1.38)
Constant	0.56 (0.22 to 1.41)	0.66 (0.27 to 1.62)
Pseudo R ²	0.07	0.07
Observations	588	650

Incidence rate ratios are reported; 95% CI in parentheses.
*p<0.05, **p<0.01, ***p<0.001, +p<0.10.
†Including: regular part-time employed; vocational training; marginally employed; near retirement, zero working hours; military service; community service; sheltered workshop.

conditions related to one's own health.^{41 42} These health conditions exclusively related to one's own health are particularly present in hospitalised men in Germany (eg, ischaemic heart disease including myocardial infarction or stroke), whereas the most common reason for hospital visits in women in Germany is 'complications of labour and delivery', followed by 'maternal care related to the fetus and amniotic cavity and possible delivery problems'⁴³—conditions related to one's own health and to the health of the infant. These conditions themselves may be main drivers of hospitalisation among women (and irrespective of the degree of purpose in life). However, it should be noted that we did not have such data (regarding various chronic conditions) available in our dataset. Thus, future research is required to test our assumptions in Germany. Future studies could also examine potential mediating factors (such as coronavirus anxiety or the general fear of hospital treatment) in the association between purpose in life and hospitalisation.

With regard to the health effects of purpose in life, an excellent overview has recently been given by Ryff and Kim.⁴⁴ They summed up previous findings and concluded that purpose in life predicts an increased longevity^{26 45} as well as better health behaviours.⁴⁶ As argued by Ryff and Kim, purpose in life may have positive effects only for some body systems such as the cardiovascular system.⁴⁴ Given the fact that cardiovascular diseases have a considerably higher lifetime prevalence rate among men in Germany,⁴⁷ it appears to be plausible that purpose in life is associated with hospitalisation in men in our study.

With regard to the underlying mechanisms, purpose in life may contribute to physical health factors via three different biobehavioural pathways—as described by Ryff and Kim⁴⁴: (1) purpose in life may have an indirect impact on health via different health behaviours.⁴⁶ Moreover, individuals who have a strong sense of purpose in life may feel less conflicting regulatory pressure when making health decisions.⁴⁸ This can help them to accept conflicting but useful health messages. (2) Another

Table 3 Determinants of hospitalisation in the past 12 months stratified by sex—findings of logistic regressions

Independent variables	Hospitalisation—men	Hospitalisation—women
Purpose in life (from 1 to 6, with higher values indicating higher purpose in life)	1.40*	1.03
	(1.02 to 1.93)	(0.79 to 1.34)
Age	1.02*	0.99
	(1.00 to 1.05)	(0.97 to 1.00)
Marital status: Married (Ref.: other including single, divorced, widowed)	0.99	0.66+
	(0.58 to 1.70)	(0.41 to 1.06)
Employment status: full-time employed	1.13	0.75
	(0.54 to 2.37)	(0.38 to 1.46)
Other†	0.67	0.82
	(0.24 to 1.90)	(0.45 to 1.51)
Health insurance: private health insurance (Ref.: statutory health insurance)	0.67	1.40
	(0.31 to 1.47)	(0.64 to 3.05)
Satisfaction with household income (from 0=completely dissatisfied to 10=completely satisfied)	0.96	0.98
	(0.85 to 1.08)	(0.88 to 1.09)
Currently smoking: Yes (Ref.: No)	1.71+	0.62
	(0.96 to 3.04)	(0.34 to 1.14)
Alcohol intake: once a month or less often (Ref.: never)	4.26*	1.11
	(1.32 to 13.77)	(0.63 to 1.97)
2–4 days per month	2.46	0.64
	(0.74 to 8.22)	(0.32 to 1.27)
2–3 days per week	4.79*	1.02
	(1.44 to 15.87)	(0.48 to 2.16)
4–6 days per week	2.29	0.80
	(0.61 to 8.58)	(0.22 to 2.90)
Daily	2.24	1.09
	(0.58 to 8.72)	(0.33 to 3.64)
Vegetarian/vegan diet: Yes (Ref.: No)	2.03	0.75
	(0.66 to 6.29)	(0.35 to 1.60)
Doing sports: less often (Ref.: Never)	1.21	0.87
	(0.55 to 2.66)	(0.41 to 1.85)
At least once a month	1.20	0.87
	(0.39 to 3.66)	(0.27 to 2.83)

Continued

Table 3 Continued

Independent variables	Hospitalisation—men	Hospitalisation—women
At least once a week	1.10	1.24
	(0.61 to 1.98)	(0.73 to 2.11)
Daily	1.00	0.46
	(0.37 to 2.74)	(0.18 to 1.18)
Self-rated health (from 1=very good to 5=bad)	1.59*	1.43*
	(1.11 to 2.28)	(1.07 to 1.90)
At least one chronic disease: Yes (Ref.: No)	1.92*	1.41
	(1.02 to 3.64)	(0.86 to 2.30)
Disability: Yes (Ref.: No)	2.01*	1.01
	(1.06 to 3.82)	(0.54 to 1.91)
Constant	0.00***	0.18+
	(0.00 to 0.01)	(0.03 to 1.25)
Pseudo R ²	0.15	0.06
Observations	588	650

ORs are reported; 95% CI in parentheses.
 *P<0.05, **p<0.01, ***p<0.001, +p<0.10.
 †Including: regular part-time employed; vocational training; marginally employed; near retirement, zero working hours; military service; community service; sheltered workshop.

possible link between purpose and health is by contributing to social and psychological resources. These resources can act as a buffer against stress.^{49 50} (3) A third link may be that purpose in life directly affects biological parameters which in turn affects physical health. For example, purpose in life is associated with lower metabolic syndrome⁵¹ and down-regulation of conserved transcriptional response to adversity gene expression.⁵²

With regard to covariates, our study showed that particularly worse self-rated health is associated with increased HCU (in terms of outpatient physician visits and hospitalisation) among both sexes. This is well in line with previous findings—as shown by a previous systematic review.¹

This is the first study investigating the association between purpose in life and HCU among the general adult population in Germany. Data were derived from a nationally representative sample. Several covariates were chosen based on the well-established Andersen model. However, it should be acknowledged that specific chronic conditions or other potential covariates were not available in our dataset (eg, school education). The established subscale ‘purpose in life’ of the six-factor model of psychological well-being was used to quantify purpose in life.

Hospitalisation in the past 12 months and the frequency of outpatient physician visits in the past 3 months were used as outcome measures. Therefore, the possibility of a recall bias cannot be dismissed. Nevertheless, this period is in accordance with previous recommendations.⁵³ Furthermore, the results of this cross-sectional study should be confirmed based on longitudinal data. For example, it cannot be ruled out that hospitalisation may contribute to future changes in purpose in life.

CONCLUSIONS

Even after adjusting for various potential confounders, there was still a gender-specific association between higher purpose in life and increased HCU. This knowledge may assist in addressing individuals at risk for underuse or overuse of healthcare services.

Future longitudinal studies are required to confirm the gender-specific association between purpose in life and HCU in other countries (including countries with other healthcare systems). Moreover, future research is required to elucidate the underlying mechanisms. Additionally, the association between purpose in life and preventive healthcare services should be examined in Germany and other countries.

Acknowledgements The data used in this publication were made available to us by the German Socio-Economic Panel Study (SOEP) at the German Institute for Economic Research (DIW), Berlin.

Contributors Conceptualisation: AH and H-HK; visualisation, AH and H-HK; review and editing of original draft: AH and H-HK; data curation: AH; methodology, AH; formal analysis, AH; project administration, AH; writing of original draft, AH; supervision, H-HK. All authors have read and agreed to the published version of the manuscript. Guarantor: AH

Funding The authors have not declared a specific grant for this research from any funding agency in the public, commercial or not-for-profit sectors.

Competing interests None declared.

Patient and public involvement Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

Patient consent for publication Not applicable.

Ethics approval This study involves human participants but was not approved since the criteria for the need of an ethical statement were not fulfilled (eg, examination of patients or risk for the respondents). Nevertheless, the German Council of Science and Humanities (Wissenschaftsrat) evaluated and approved the German Socio-Economic Panel (GSOEP). Participants gave informed consent to participate in the study before taking part.

Provenance and peer review Not commissioned; externally peer reviewed.

Data availability statement Data may be obtained from a third party and are not publicly available. GSOEP data access must comply with high-security standards for maintaining confidentiality and protecting personal privacy. The data are also subject to regulations limiting their use to scientific purposes, that is, they are only made available to the scientific community (in German language only). After conclusion of a data distribution contract with DIW Berlin, the data of every new wave will be available on request either via personalised encrypted download or via certified mail on a DVD. Please visit the website for further information (https://www.diw.de/en/diw_02.c.238237.en/conditions.html).

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