

Meaning in life and quality of life: comparison between palliative care patients and a representative sample of the Swiss population

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Abstract

Background and objectives Existential areas, and in particular the concept of meaning in life, represent a key topic in palliative care. The aims of this study are to explore (i) the differences in perceived meaning in life (MIL) and in the meaning-relevant life areas between a representative sample of the Swiss population and palliative care patients, and (ii) to what extent MIL can be considered as a significant predictor of quality of life (QOL) in the two populations. **Methods** A cross sectional study was conducted separately for the patients (face-to-face interviews) and the representative sample of the Swiss population (telephone survey). MIL was measured with the Schedule for Meaning in Life Evaluation (SMILE) and QOL with a with a single item visual analogue scale (0-10). Socio-demographic variables were controlled for in the analyses. **Results** 206 palliative care patients and 1015 participants from the Swiss population completed the protocol. Results indicated high MIL scores in both population even if the difference was significant (patients 81.9 vs general population 87, $p < .001$). Compared to the Swiss population, patients were more likely to cite “family” (OR=1.78), “social relations” (OR=1.9), “spirituality and religion” (OR=3.93), “social commitment” (OR=1.94), and “growth” (OR=2.07), and less likely to cite “finances” (OR=0.15) and “health” (OR=0.21) as MIL-relevant areas. The SMILE scores and MIL areas explained 21.8% of the QOL variance for the palliative care patients and 15.1% for the representative sample. **Conclusions** Our data emphasize the importance of MIL as a contributor to QOL in both clinical and non-clinical settings. From a clinical perspective, it highlights the importance of the life areas contributing to MIL, in particular the social interactions, since they play a significant role for the patients’ QOL.

Introduction

The concept of Quality of Life (QOL) is the central outcome measure in palliative care research (1). The World Health Organization (WHO), defines QOL as “the individual perception of the position in life in the context of the culture and value system in which they live, and in relation to their goals, expectations, standards and concerns”(2). In palliative care research, focusing on a general individual perception of QOL, as defined by the WHO, by using a single item question is still relatively uncommon. Many instruments used for research were either designed using a “health-related” concept of QOL (3) or a multidimensional perspective considering different domains (e.g. physical, psychological, social and existential) potentially contributing to QOL (4, 5). Several studies have shown in recent years that QOL at the end of life is closely linked to non-physical determinants (6-8).

Amongst these, the existential domain appears to be particularly relevant for palliative patients (4, 9). Currently, the concepts of “existential” and “spiritual” issues are often used interchangeably in the literature (10). Based on a report of a consensus conference, spirituality is defined as “the aspect of humanity that refers (i) to the way individuals seek and express meaning and purpose, and (ii) the way they experience their connectedness to the moment, to self, to others, to nature and to the significant and sacred” (11). Meaning in life (MIL) therefore represents a core element of spirituality. Existential distress, characterized by a loss of MIL, represents an important clinical issue, as it has been associated with

several important outcomes in the end of life context: anxiety and depression (12, 13), suicidal ideas (14), the desire for hastened death (15), as well as various distressing physical symptoms (16).

From a clinical point of view, most of the interventions designed to address existential distress consider MIL as a highly individual construct, which is difficult to capture from an external standpoint (17). The identification of life areas contributing to MIL may represent a crucial point when initiating a therapeutic process with patients showing existential suffering (18). Several instruments were developed in order to identify these life areas (19). Among the few instruments using an idiographic approach, the Schedule for Meaning in Life Evaluation (SMILE) allows individuals to choose freely the life areas that they consider important for their own MIL (20).

We studied a representative sample of the Swiss population and a sample of Swiss palliative care patients using the SMILE (6, 21). Comparing the two populations may contribute to identify specific MIL areas contributing to QOL as the end of life context that could benefit from psychological interventions. In analogy to the study of Fegg et al. (22) in a German sample, we would like to compare the two Swiss populations (taking into account possible differences between linguistic regions), and additionally explore whether MIL can predict QOL in palliative care patients.

Methods

The data for this comparison study were collected separately for the palliative care patients and the representative sample of the Swiss population. Collection methods and part of the results have been published (6, 21).

Briefly, data from of a representative sample of the general population in Switzerland were collected through a telephone survey performed by a professional survey company (21). For palliative care patients, an exploratory, cross-sectional study, based on structured face-to-face interviews, was conducted in all three Swiss linguistic regions (6). Both studies included assessment of MIL, QOL, health status and sociodemographic data (gender, age, education, employment, marital status, residence and linguistic region).

Instruments

· The Schedule for Meaning in Life Evaluation (SMILE)

This instrument was developed and validated by Fegg et al. (20). Respondents are first asked to indicate three to seven areas that provide meaning to their life. The relevant areas contributing to MIL were classified in one of 15 categories based on a German nationwide survey and reported in a specific manual developed for this instrument. They include: family, partnership, social relations, occupation/work, leisure time/relaxation, home/garden, finances, spirituality/religion, health, satisfaction, nature/animals, social commitment, hedonism, art/culture, and growth (for details on the categories and

the SMILE administration see Ref. 6 and www.psychotherapie-muenchen.de/downloads/SMiLE_Manual.pdf).

The importance and the current level of satisfaction associated to each area are rated on Likert scales (seven points, from -3 to +3, for the satisfaction, and eight points, from 0 to 7, for the importance). An “index of weighting” (IoW, range 0-100) and an “index of satisfaction” (IoS, range 0-100) indicate the mean weighting score and the mean satisfaction score for the areas mentioned, respectively. A SMILE total score, “index of weighted satisfaction” (IoWS, 0-100) indicates the global MIL satisfaction.

· *Subjective QOL Single-item*

In both groups, subjective QOL was measured after completion of the SMILE questionnaire with the Single-item Quality of Life Scale – Numeric Rating Scale 0 -10 (SQOLS), ranging from 0 (worst imaginable quality of life) to 10 (best imaginable quality of life). This approach to measuring quality of life was validated by de Boer et al. and Idler et al. (23, 24).

Statistics

Differences between sociodemographic characteristics of the two samples were assessed using the chi-square test. The mean of the different SMILE scores was computed in both samples, and linear regression models were used to determine whether sample membership could explain the scores, controlling for sociodemographic factors. The distribution of MIL areas cited by the respondents was computed separately for each sample. A logistic regression model was computed to assess the presence of each MIL area in function of the sample membership.

After having applied bivariate analyses (t-test and correlation), we built models explaining the subjective QOL from the SMILE scores. We began by considering the full sample, and then we built separate models for the patient and the general population samples. In each case, we proceeded in two steps: In the first one, we used only the three main scores of the SMILE as predictors (IoS, IoW, IoWS). In the second one, we also included indicator variables of the presence or not of the 15 different MIL areas, and we applied a backward selection procedure in order to identify the best model. All models were controlled for socio-demographic characteristics (age, gender, marital status, and education).

The type I error was set to 0.05 for all inferential computations. Statistical analyses were performed using the Statistical Package for the Social Sciences (SPSS) version 24.

Results

Recruitment and descriptive results

For the Swiss population, 6671 telephonic contacts were realized, and finally 1015 (15%) individuals completed all questionnaires (405 French, 400 German, and 210 Italian participants; see ref. 21 for details). Regarding the patients sample, in the three Swiss linguistic regions, 588 participants met the

inclusion criteria. Finally, 206 participants gave their consent and completed the questionnaires (77 French, 89 German, and 40 Italian patients; see ref. 6 for details).

Table 1 gives the sociodemographic and medical characteristics of the two populations. Results showed significant differences between the two populations regarding age, marital status, and education level. However, effect sizes can be considered as small given the Cramer's V (between .016 and .180). Cancer was the most common diagnosis among the palliative care patients.

[Insert table 1]

Differences in MIL between palliative care patients and the Swiss sample

Results of the linear regressions indicated significant differences between the two populations regarding the index of satisfaction (IoS), the index of importance (IoW) and the SMILE total score (IoWS), with lower scores in the patients sample. On the other hand, no difference was found regarding the number of cited areas.

[Insert table 2]

Differences in sources of MIL between palliative care patients and the Swiss sample

"Family" and "social relations" were the two most cited areas in both populations (76% for family in the two populations and 49% vs 39% for the "social relations" in the patients and the Swiss sample respectively). The relational dimension represents therefore the most important dimension for MIL in the two populations. The results of the logistic bivariate regression model show that patients were significantly more likely to cite "family" (OR=1.78), "social relations" (OR=1.9), "spirituality and religion" (OR=3.93), "social commitment" (OR=1.94), and "growth" (OR=2.07), and less likely to cite "finances" (OR=0.15) and "health" (OR=0.21) (see table 3).

[Insert table 3]

Notice that the apparent inconsistency between the percentages and the odds ratio for the family category is due to the fact that the regression model was controlled for sociodemographic factors, which was not the case for the percentages. In particular, there were significant associations between marital status, age and civil status.

MIL as a QOL predictor

The results of the independent samples t-test indicated a significant difference in QOL between the palliative care patients and the Swiss sample (M=5.03, sd=2.6; M=7.56, sd=1.7 respectively; t=17.549, p=.000). The correlation values between QOL and the SMILE scores indicated that these two dimensions were not independent and therefore justified the use of linear regressions to test in which measure MIL was associated with QOL (Pearson correlation values were between .220 and .364, p=.000).

The differences between the two populations clearly warranted a separate analysis in order to obtain a better identification of the QOL predictors. Therefore, we performed regression analyses on the two samples separately.

Palliative care patients

A first linear regression model (see top of table 5), including the three scores of the SMILE, showed that 13% of the QOL variance (adjusted R²) was explained, but no predictor reached significance. A second linear regression model (see bottom of table 5), using the backward selection process with the 15 MIL areas in addition to the SMILE scores, explained 22% of the QIL variance. The results showed a positive and significant association with the index of importance (IoW) of the SMILE ($\beta=.034$, $p=.011$), and also the “satisfaction” ($\beta=1.511$, $p=.005$) and the “social commitment” ($\beta=1.814$, $p=.005$) areas.

[Insert table 4]

Swiss sample

A first linear regression model (see top of table 6), including the three scores of the SMILE, explained 13% (adjusted R²) of the QOL variance, with a positive significant association with the index of importance (IoW) of the SMILE ($\beta=.017$, $p=.000$). A second linear regression model (see bottom of table 6), using the backward selection process with the 15 MIL areas in addition to the SMILE scores, explained 15% of the QOL variance. The results showed a positive and significant association with the index of importance (IoW) ($\beta=.019$, $p=.000$) and the total score (IoWS) of the SMILE ($\beta=.040$, $p=.000$), and also the “satisfaction” ($\beta=1.511$, $p=.006$) and the “social relations” ($\beta=1.814$, $p=.011$) areas.

[Insert table 4]

Discussion

To the best of our knowledge, this study is only the second one that aims to explore differences in MIL between a palliative care population and a representative sample of a population from a national survey, after the study of Fegg et al. (22). The latter study took place in Germany, a more homogeneous socio-cultural context than Switzerland with its mix of German and Latin populations. A novel purpose of our study was to explore the relationship between MIL and the QOL in these two populations.

Level of satisfaction in MIL: the meaning-making hypothesis

The high levels reported in the SMILE total scores in both populations (> 80) are comparable with those found in other studies including different kind of populations: cancer patients (25, 26), palliative care patients (27, 28), and general populations (22, 29). In all these studies, scores ranged between 70 and 80. This propensity towards high SMILE total scores is also apparent in a study with Indian palliative care patients (30). Fegg et al. (20) already mentioned a possible ceiling effect of the SMILE to explain the small difference between the samples. At first sight, these fairly high scores in MIL appear to be

surprising given the end of life context. However, the prevalence of mood disorders is only about 30% in the oncological, palliative care and haematological settings (31). This indicates that a majority of patients are able to cope, or at least to adapt successfully to the constraints of an end-of-life situation.

Another possible explanation, as already mentioned by Fegg et al. (22) and Stiefel et al. (26), is the “response shift” phenomenon, which refers to a personal change in values, goals and expectations towards the remaining life (32). Such a transformation process may occur, consciously or subconsciously, when people encounter adverse or traumatic experiences during their lives. The announcement of a potential life threatening illness, and the subsequent confrontation with one’s own death, can certainly be viewed as a one of “those events that have seismic impact on the individual assumptive world” (33). A growing body of evidence exists on the psychological mechanisms employed by individuals in order to cope with adversity and difficulties (see e.g. the review of Windle (34) on resilience, or the review of Tedeschi et al. (35) on post-traumatic growth).

Different meaning-making processes have been described and proposed in the psychological literature, for example using assimilation and accommodation (36). These processes contribute to decrease the discrepancy between a global meaning, consistent with the personal sense of identity, and a situational meaning that arises in the context of a stressful life event. It is possible that such an adaptation or adjustment process may explain the low difference between our two samples. This adjustment hypothesis is made plausible by the fact that most palliative care patients had received their illness diagnosis several months prior to the study, thus allowing for a timeframe for adjustment. This hypothesis requires confirmation in a longitudinal study.

Meaning relevant areas: differences between groups as marks of an adaptation process

“Family” and social relations” appear to be the most important domains contributing to MIL in both groups, with the addition of “occupation and work” which is the second most cited area in the Swiss general population. Compared with the general population sample, patients were more likely to cite “family” and “social relations” as relational areas, and “growth” and “spirituality” as psycho-existential areas. An over representation of spirituality and relationship as areas contributing to MIL in palliative care patients was also found in the study of Fegg et al. (22). Conversely, the Swiss representative sample was more likely to mention “finances” and “health” compared with the palliative care patients.

Relationships and spirituality also appear in several studies exploring the sources of MIL by using methodologies other than the SMILE (37-39). The social relationship dimension was also found to be prominent in advanced cancer patients of different European countries (Spain, Switzerland and Germany) (25), as well as in India (30). In the general population, social integration concerns not only QOL but also survival (40). In the end of life context, a recent systematic review reported the effectiveness of palliative care interventions enhancing social support on the patients’ psychological wellbeing (41). Our results also speak in favour of the development of “compassionate communities” that aim to strengthen and broaden this kind of social support (42).

The shift towards more “inner directed” values and sources may be explained from a developmental perspective: later stages of life have been shown to lead people towards deeper introspection and integration (43-45). Terror management theory has also highlighted the importance of mortality awareness for the response shift phenomenon (46, 47). While being confronted with death and finitude may induce fear and anxiety, experiential reality of impending death may also elicit a so-called “mortality-induced growth” associated with a transition from extrinsically oriented goals to intrinsic ones, such as appreciation for life, MIL, and spirituality.

The association between MIL and QOL

The finding that MIL represents a significant predictor of QOL, explaining up to 22% of the QOL variance, highlights the importance of the existential dimension for QOL in both populations studied, and is consistent with previous findings (6, 21). While the association between QOL and sociodemographic variables has been more frequently assessed in the general population (48-50), the majority of studies looking at the association of the existential dimension to QOL were realized in the oncology and palliative care settings (5, 7, 9, 51).

Interestingly, the part of explained variance increased in the palliative care patients when considering the life areas contributing to MIL (from 13% to 22%), more so than in the general population (from 13% to 15%). Areas mentioned by patients refer to both intrinsic (“home garden”, “art-culture”) and extrinsic (“partnership”, “social commitment”) domains. Viktor Frankl, one of the pioneers of existential psychotherapy, underscored the necessity of considering MIL from a personal perspective by taking into account the concrete manifestations of MIL experienced through creativity and inner attitudes towards traumatic events (18). Our results confirm the necessity to focus on the essential life domains of patients in the end of life context. These domains may be viewed as an adapted set of areas relevant to the patients’ identity and sense of coherence, allowing them not only to anchor themselves in the reality, but also to identify new purposes and directions in which to invest for the remaining time. This approach can also be used as a “door opener” in order to address the existential dimension with palliative care patients (26).

Limitations

This study has several limitations. First, the methodology used to assess MIL with the SMILE questionnaire was different in the two populations (face-to-face interviews vs. telephone survey), which may account for some divergences in the responses. Second, the categories associated with the areas were assigned “a posteriori”, which implies a degree of subjectivity by the investigators. Third, although the use of a single-item scale for the assessment of QOL has been validated in the clinical context (52, 53) and appears justified when considering the subjective approach to QOL advocated by the WHO, such an evaluation does not allow an in-depth assessment of QOL. Finally, the cross-sectional design of this study does not allow for a causal interpretation of the relationship between MIL and QOL.

Conclusions

In conclusion, our data reinforce the notion of the importance of MIL for QOL in both clinical and non-clinical settings. From a clinical perspective, it highlights the importance of considering closely the concrete life areas contributing to MIL in every single patient, since they play an important role not only for the patients' MIL, but also for their QOL.

For future research, it will be important to include indicators of health and functional status, as well as psychological and social indicators, in order to improve our understanding of the MIL and QOL determinants. Concerning more specifically the MIL concept, different ways of exploring MIL, such as the search for meaning, defined as a desire of people to increase their understanding of the meaning (54) and the depth of meaning, defined as the quality of an individual experience of meaning (55), could help in decreasing the large unexplained MIL variance, and thus contribute to a better understanding of what contributes to QOL at the end of life..

List Of Abbreviations

QOL: quality of life

MIL: meaning in life

SMILE: schedule for meaning in life evaluation

IoS: index of satisfaction

IoW: index of weighting

IoS: index of weighted satisfaction

SQOLS: Single-item Quality of Life Scale

Declarations

Ethics approval and consent to participate

Regarding the research project involving patients in the end of life context, it was approved by the Human Research Ethics Ethical Committee of the Vaud province in Switzerland and written consent were obtained from all participants. Regarding specifically the survey with the representative sample of the Swiss population, the Ethical Committee did not ask for a submission since the participants were not patients and the data collection was anonymised. Nevertheless, all participants were informed that this survey was mandated by the University hospital of Lausanne in Switzerland and concerned perceived meaning in life, quality of life and general health status.

Competing interests

The authors declare that they have no competing interests.

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Consent for publication

Not applicable

Availability of data and materials

The datasets used and analysed during the current study are available from the corresponding author on reasonable request.

Authors' contributions

MB was involved in the conception and the design of the study, the acquisition and the interpretation of the data, and the writing of the submitted version. AB was involved in the analysis and the interpretation of the data and the writing of the submitted version. FS was involved in the conception and the design of the study, the acquisition of the data and the revision of the submitted version. CG was involved in the conception and the design of the study, the acquisition of the data and the revision of the submitted version. GDB was involved in the conception and the design of the study, and the writing of the submitted version. All authors read and approved the submitted version.

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Tables

Table 1: Demographic characteristics in each sample; main diagnosis of the palliative care patients

Variables	Patients		Swiss sample		Total		p-value	Cramer's V
	n	%	n	%	n	%		
Age in years							<0.001	0.261
16-19	0	0.0	42	4.1	42	3.4		
20-29	0	0.0	99	9.8	99	8.1		
30-39	1	0.5	99	9.8	100	8.2		
40-49	12	5.8	144	14.2	156	12.8		
50-59	38	18.4	121	11.9	159	13.0		
60-69	65	31.6	244	24.0	309	25.3		
70-79	58	28.2	167	16.5	225	18.4		
80-89	28	13.6	88	8.7	116	9.5		
90-99	4	1.9	11	1.1	15	1.2		
Total	206	100.0	1015	100	1221	100.0		
Gender							0.575	0.016
Male	100	48.5	471	46.4	571	46.8		
Female	106	51.5	544	53.6	650	53.2		
Total	206	100.0	1015	100.0	1221	100.0		
Marital status							<0.001	0.180
Single	31	15.4	209	20.7	240	19.8		
Married/legal partnership	91	45.3	597	59.0	688	56.8		
Divorced/separated	45	22.4	92	9.1	137	11.3		
Widowed	34	16.9	113	11.2	147	12.1		
Total	201	100.0	1011	100.0	1212	100.0		
Education							<0.001	0.149
Primary school	44	21.6	174	17.1	218	17.9		
Professional diploma	100	49.0	432	42.6	532	43.6		
Secondary school	5	2.5	102	10.0	107	8.8		
Highschool	30	14.7	92	9.1	122	10.0		
University	24	11.8	208	20.5	232	19.0		
Other	1	0.5	7	0.7	8	0.7		
Total	204	100.0	1015	100.0	1219	100.0		
Region							0.598	0.029
French	77	37.4	405	39.9	482	39.5		
German	89	43.2	400	39.4	489	40.0		
Italian	40	19.4	210	20.7	250	20.5		
Total	206	100.0	1015	100.0	1221	100.0		
Primary diagnosis								
Cancer	197	95.6						
Heart disease	1	0.5						
Pulmonary disease	1	0.5						
ALS	5	2.4						
Missing	2	1.0						
Total	206	100						

Table 2: Descriptive characteristics of the different SMiLES scores in both samples, and linear regression models predicting these scores from group membership (patient vs Swiss sample; the Swiss sample

being the reference)

SMiLE Indices	Patients	Swiss sample	Total R2 adjusted	B	Beta standardized	p
	Mean (sd)	Mean (sd)				
loW	81.0 (14.3)	82.8 (12.5)	0.030	-2.230	-0.064	0.029
loS	79.9 (17.6)	86.1 (13.4)	0.044	-6.715	-0.173	<0.001
loWS	81.9 (17.2)	87.0 (13.5)	0.033	-5.463	-0.142	<0.001
Number of areas mentioned	4.0 (1.5)	4.1 (1.4)	0.000	-0.059	-0.016	.584

Regression models are controlled for sociodemographic variables: age, gender, marital status, education; loW=index of weighting; loS=index of satisfaction; loWS=index of weighted satisfaction

Table 3: Percentage of participants listing each MIL area category in each sample and logistic regression model predicting the presence of each MIL area from group membership (patient vs Swiss sample (reference category))

	Patients (n=206)	Swiss sample (n=1015)	Odds ratio	95% confidence interval		B	p
	%	%	Exp (B)				
Family	76.7	76.3	1.783	1.188	2.676	0.578	0.005
Partnership	18.0	16.4	1.468	0.949	2.270	0.384	0.084
Social relation	49.0	39.1	1.898	1.365	2.641	0.641	<0.001
Occupation & work	24.8	41.5	0.748	0.505	1.108	-0.290	0.148
Leisure time	33.0	37.7	0.872	0.617	1.232	-0.137	0.438
Home & garden	10.2	7.5	1.087	0.636	1.857	0.083	0.762
Finances	1.9	10.0	0.155	0.055	0.436	-1.862	<0.001
Spirituality & religion	32.5	10.6	3.933	2.621	5.901	1.369	<0.001
Health	14.6	36.1	0.213	0.136	0.333	-1.546	<0.001
Satisfaction	15.1	11.5	1.133	0.707	1.815	0.125	0.605
Nature & animals	29.6	20.7	1.219	0.839	1.771	0.198	0.298
Social commitment	8.3	3.9	1.941	1.015	3.715	0.663	0.045
Hedonism	7.8	8.9	0.800	0.436	1.468	-0.223	0.471
Art & culture	19.4	18.1	0.948	0.620	1.451	-0.053	0.806
Growth	16.0	7.9	2.065	1.279	3.333	0.725	0.003

Regression models are controlled for sociodemographic variables: age, gender, marital status, education.

Table 4: Linear regression models predicting the subjective QOL among the palliative care patients sample

	Coefficient	Robust Standard error	t	p	CI (95%)	
Regression from the SMILE scores						
IoS	.073	.046	1.575	.117	-.019	.164
IoW	.018	.017	1.111	.268	.014	.051
IoWS	-.057	.045	-1.268	.207	-.145	.032
Regression by adding the MIL areas						
IoW	.034	.013	2.560	.011	.008	.061
Partnership	.932	.515	1.810	.072	-.084	1.949
Home garden	1.025	.563	1.820	.070	-.087	2.137
art-culture	.827	.475	1.743	.083	-.110	1.765
Satisfaction	1.511	.526	2.872	.005	.472	2.549
Social commitment	1.814	.644	2.815	.005	.542	3.086

Regression models are controlled for sociodemographic variables: age, gender, marital status, education; for the backward regression, only significant factors are displayed; CI: Confidence Interval

Table 5: Linear regression models predicting the subjective QOL among the Swiss sample

	Coefficient	Robust Standard error	t	p	CI (95%)	
Regression from the SMILE scores						
IoS	.011	.016	.669	.504	-.021	.042
IoW	.017	.004	3.932	.000	.009	.026
IoWS	.030	.016	1.904	.057	-.001	.061
Regression by adding the MIL areas						
IoW	.019	.004	4.376	.000	.010	.027
IoWS	.040	.004	10.481	.000	.033	.048
Social relation	.264	.104	2.547	.011	.061	.468
Home garden	.338	.191	1.775	.076	-.036	.713
Finances	-.312	.167	-1.873	.061	-.639	.015
Satisfaction	.433	.158	2.749	.006	.124	.742
Social commitment	.466	.252	1.847	.065	-.029	.962

Regression models are controlled for sociodemographic variables: age, gender, marital status, education; for the backward regression, only significant factors are displayed; CI: Confidence Interval