Research Article

Longitudinal Associations of Autonomy, Relatedness, and Competence with the Well-being of Nursing Home Residents

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Abstract

Background and Objectives: As proposed by the self-determination theory, satisfying nursing home residents' needs for autonomy, relatedness, and competence may improve their well-being. This is the first study to test the longitudinal relations of the satisfaction of these three basic psychological needs to the subjective well-being of nursing home residents and to determine whether a balance among the satisfaction of the three needs is important for well-being.

Research Design and Methods: Participants in this longitudinal survey study included 128 physically frail residents (mean age 85 years) at four Dutch nursing homes. Satisfaction of the three basic psychological needs was measured at baseline, and depressive feelings and life satisfaction 5–8 months later. Absolute differences between the three basic need satisfaction scores were summed to create a score of need satisfaction balance.

Results: All three needs were related to both well-being measures over time, although autonomy had the strongest relationships. Only autonomy and competence were uniquely associated with depressive feelings, and only autonomy was uniquely associated with life satisfaction. The need satisfaction balance score was related to well-being independent of the autonomy and relatedness scores.

Discussion and Implications: These results confirm that all three basic psychological needs are important for nursing home residents' well-being, with autonomy having the strongest and most consistent relationship to their well-being. Additionally, high satisfaction of one need does not compensate for low satisfaction of another. Supporting residents' needs for autonomy, relatedness, and competence should, therefore, have a central role in nursing home culture-change interventions.

Keywords: Nursing home, Well-being, Satisfaction, Person-centered care, Depression, Autonomy, Self-determination theory

The well-being of nursing home residents is gaining increasing attention, which is warranted given the high loneliness and depression rates in nursing homes (Drageset, Kirkevold, & Espehaug, 2011; Jongenelis et al., 2004). The growing nursing home culture-change movement stresses

the importance of improving both quality of care and quality of life via a range of domains of the residents, nursing home environment, and management (Koren, 2010). However, there are many barriers to implementing culture change (Corazzini et al., 2015), and published evidence

shows no consistent effectiveness of culture-change interventions in improving residents' well-being (e.g., Shier, Khodyakov, Cohen, Zimmerman, & Saliba, 2014).

Psychological theories of well-being, which are established in a large body of research literature, may support the culture-change movement in determining the factors on the resident level that contribute to quality of life. Self-determination theory (SDT; Ryan & Deci, 2000) proposes that the *autonomy* and *relatedness* domains should be given a central role together with that of *competence*, as these are basic psychological needs that are vital to human well-being. This current survey study examines the longitudinal relations of the satisfaction of these three basic psychological needs to the well-being of physically frail nursing home residents and tests whether high satisfaction of one need can compensate for low satisfaction of another.

The SDT states that a social context can facilitate or hinder well-being through the satisfaction of the innate basic psychological needs of autonomy, relatedness, and competence (Ryan & Deci, 2000). *Autonomy* is defined as having a sense of choice and volition in the regulation of behavior, *relatedness* refers to feeling connected to others and experiencing mutual support, and *competence* refers to feeling effective (Ryan, Huta, & Deci, 2008). Similar to the three nutrients that a plant needs to grow—soil, water, and sunlight—the satisfaction of autonomy, relatedness, and competence are essential for the well-being of humans to prosper. The SDT states that living a life that satisfies all three needs can lead to stable long-term subjective well-being (Ryan & Deci, 2001), consisting of a balance between positive emotions and negative emotions (affective component), and satisfaction with life (cognitive-evaluative component; Diener, Emmons, Larsen, & Griffin, 1985).

Support for the influence on well-being of autonomy, relatedness, and competence has been found in various cultures (e.g., Chen, Van Assche, Vansteenkiste, Soenens, & Beyers, 2015) and in a variety of life domains, such as sports, work, and school (e.g., Baard, Deci, & Ryan, 2004; Reinboth, Duda, & Ntoumanis, 2004; Tian, Tian, & Huebner, 2016). A meta-analysis in the health care context showed that basic psychological needs satisfaction has weak to strong positive relations with positive well-being measures (e.g., positive affect) and weak to moderate negative relations with negative well-being measures (e.g., depression, negative affect; Ng et al., 2012). Although SDT proposes that the three basic psychological needs are essential for well-being across one's life span (Ryan & Deci, 2001), most of the current research has been conducted on teens and young adults. Only a few studies have tested this proposal on older adults in a nursing home setting.

Satisfaction of the basic psychological needs may become more challenging for older adults in a nursing home context: others often decide what and when they eat (undermining autonomy), aged friends die (undermining relatedness), and caregivers take over many everyday tasks (undermining competence). Two correlational

studies involving nursing home residents found relations between the psychological need for autonomy and well-being (Vallerand & O'Connor, 1989; Vallerand, O'Connor, & Blais, 1989), and Kasser and Ryan (1999) found marginally significant correlations of both autonomy and relatedness to well-being. More recently, two survey studies and an observational study provided further cross-sectional support for the relationship between the satisfaction of all three basic psychological needs and well-being in nursing homes (Custers, Kuin, Riksen-Walraven, & Westerhof, 2011; Custers, Westerhof, Kuin, Gerritsen, & Riksen-Walraven, 2013; Custers, Westerhof, Kuin, & Riksen-Walraven, 2010). However to date, only one relevant longitudinal study in a nursing home context has been conducted, showing that satisfaction of the three basic psychological needs was related to depressive feelings of new residents 3 months after their admission to the nursing home (Custers, Cillessen, Westerhof, Kuin, & Riksen-Walraven, 2014). Clearly, additional longitudinal research is needed to test the relationship between the satisfaction of all three needs to both the affective and the cognitive-evaluative component of subjective well-being of physically frail nursing home residents. This was the first aim of the current research.

The SDT suggests that each need makes a unique contribution to well-being. Returning to the plant metaphor, just as a plant cannot thrive without water or sunlight, people also need satisfaction in all three domains—autonomy, relatedness, and competence—to experience well-being (Ryan & Deci, 2017; Ryan & La Guardia, 2000). Indeed, in a meta-analysis of the health care context, all three basic needs were individually related to positive and negative measures of well-being (Ng et al., 2012). However, studies of older adults in residential homes and hospitals have shown some variability in results, with only one or two of the needs explaining the unique variance of diverse well-being measures (Ferrand, Martinent, & Durmaz, 2014; Souesme, Martinent, & Ferrand, 2016). In the current study, we also tested in a sample of the nursing home residents the unique associations of all three basic psychological needs with subjective well-being. In addition, we determined the similarities or differences in the strength of these relationships.

Furthermore, high satisfaction of one need may not compensate for low satisfaction of another need any more than giving a plant more water can make up for a lack of sunlight. Sheldon and Niemiec (2006) proposed in their balance hypothesis that all three needs should be equally satisfied for optimal well-being. An equal amount of satisfaction for all needs (e.g., 4 on a scale from 1 to 5 for each need) would be better than a variability between the needs in amount of satisfaction (e.g., 5, 4, and 3 for autonomy, relatedness, and competence, respectively), even though the aggregated mean would be the same. Indeed, when controlling for the absolute scores of need satisfaction across several studies with differing designs,

it was found that the balance of need satisfaction was associated to the well-being of college students from various countries (Sheldon, Abad, & Omoile, 2009; Sheldon & Niemiec, 2006). Remarkably, no other study has yet tried to replicate these findings in other populations. Consequently, the current study tested whether balanced satisfaction of the three needs is important for well-being in a nursing home sample.

This is the first longitudinal study in a nursing home context that tests the relationship of psychological need satisfaction to both the affective and the cognitive-evaluative components of subjective well-being. No other study in this setting has focused specifically on the unique contribution of these needs and the balance between the levels of satisfaction of the needs. Based on the premises of SDT, we hypothesized that:

1. The satisfaction of the basic psychological needs is positively related to subjective well-being across time.
2. The satisfaction of each basic psychological need has a unique positive relation to subjective well-being across time.
3. The satisfaction of each basic psychological need has an equally strong positive relation to subjective well-being across time.
4. Balance among the basic psychological needs has a positive relation to well-being across time, independent of the amount of need satisfaction.

Research Design and Methods

Sample and Procedure

The participants in this study were physically frail residents in somatic long-term care units at four Dutch nursing homes managed by a single long-term care provider. The first two measurement waves (T0, T1) of a longitudinal study were used, with a 5- to 8-month-period between T0 and T1. Self-reported general basic psychological need satisfaction was measured at T0, and subjective well-being was measured at T0 and T1.

All residents of the participating units received informational letters. Exclusion criteria were as follows: (a) major hearing, speech or cognitive problems or dementia and (b) a recent major life event (e.g., hospital admission, illness, the recent death of a child) as determined by a professional caregiver of the unit. The first author—or another trained member of the research team consisting of two psychology undergraduates and two psychologists—approached each eligible resident. Participants signed an informed consent form. A pilot study showed that some residents had trouble understanding the scale answer options. To minimize the number of options, the researcher first read the questions aloud in a closed question format (yes/no) and then provided only the relevant scale options. After completing the questionnaire, the researcher informed the resident about the continuation of the study.

Measures

Satisfaction of basic psychological needs was measured using the Basic Need Satisfaction in Life Scale (BNS-LS; Gagne, 2003). The Dutch translation of this scale has been validated in previous nursing home research (Custers et al., 2010). This scale consists of 21 items measuring satisfaction of the need for autonomy (seven items, e.g., “I feel like I can decide for myself how to live my life”), relatedness (eight items, e.g., “I really like the people I interact with”), and competence (six items, e.g., “I often do not feel very capable”, reverse scored). The answers are given on a scale from 1 *never* to 5 *always*. Subscale means are calculated, with higher scores indicating greater satisfaction. The autonomy and relatedness subscales were reliable in the current sample, with alpha coefficients of .70 and .80, respectively. The subscale competence had a Cronbach’s alpha of .60; deleting items did not increase reliability.

To test the balance hypothesis, a *balance score* was calculated by computing the absolute difference between the satisfaction scores of all three pairs of needs (i.e., autonomy-relatedness; autonomy-competence; relatedness-competence). These three values were then summed, following the method proposed by Sheldon and Niemiec (2006). Using our 5-point scale, this score could range from 0 (equal satisfaction among the needs) to 8 (maximal difference between the needs, with scores of 1, 3, and 5). The scores were transformed by subtracting them from the maximum possible score of 8, to create a variable in which a higher score corresponds to a greater balance.

Subjective well-being was measured with two scales. The affective component of subjective well-being was measured using the Dutch version of the Geriatric Depression Scale (GDS; Jongenelis et al., 2007). This scale consists of eight items (e.g., “Do you feel that your life is empty?”), measuring the presence of both positive and negative emotions, answered with yes/no, and is specifically designed for nursing home residents. A sum score is computed, with higher scores indicating more depressive feelings. In the current sample, this scale had a reliability of $\alpha = .85$ at T1.

The cognitive-evaluative component was measured using the Satisfaction With Life Scale (SWLS; Diener et al., 1985; Pavot & Diener, 1993). This scale consists of five items measuring one’s evaluation of life as a whole. The Dutch translation of the scale was used (e.g., Custers et al., 2010), with answers adapted to a scale from 1 *totally disagree* to 5 *totally agree*. A pilot study showed residents experienced difficulty with understanding the negatively stated question (*If I could live my life over, I would change almost nothing*), so it was restated to a positive question (*If I were able to do my life over, I would do it very differently*). A sum score was calculated, with higher scores indicating greater life satisfaction. In the current sample, this scale had a reliability of $\alpha = .76$ at T1.

Analysis Plan

Missing data were dealt with in two ways: mean replacement and imputation. Missing data on individual items

(T0 = 2.5%, T1 = 0.7%) from questionnaire completers were replaced with the respondent's mean for that subscale for that measurement wave. For the dropouts at T1, missing data (28.9%) were imputed using the expectation maximization (EM) algorithm (Dempster, Laird, & Rubin, 1977) for the total group, with 25 iterations. Imputations were conducted at the subscale level. Imputation was suitable since the Little's Missing Completely At Random (MCAR) test showed that the missing data were completely at random ($\chi^2 = 36.4$, $df = 49$, $p = .909$). Given the relatively high percentage of missing data, we also reported results of completers-only for every main analysis. Tables with completers-only data are available as Supplementary Materials.

To test the first hypothesis, correlations between the subscales of need satisfaction and both depressive feelings and satisfaction with life were analyzed, with $r \leq .29$ indicating weak, $r \leq .49$ moderate and $r \leq .50$ strong correlations (Cohen, 1988). The unique contribution of each need (Hypothesis 2) was tested using two separate multiple regression analyses, with depressive feelings and satisfaction with life at T1 as dependent variables and the three needs subscales entered simultaneously. To compare the strength of the relationship of each need to subjective well-being at T1 (Hypothesis 3), Fisher's r -to- z transformation was conducted using the computer software of Lee and Preacher (2013). The balance hypothesis (Hypothesis 4) was tested with two hierarchical multiple regression analyses, with depressive feelings and satisfaction with life at T1 as dependent variables. In the first step, the three needs subscales were entered simultaneously as control variables, and in the second step, the balance score was entered as a control variable. With both the basic needs satisfaction scales and the composite balance score included, multicollinearity was a potential problem in this analysis. A variance inflation factor (VIF) score of around 10 was considered indicative of multicollinearity between independent variables (Myers, 1990), leading to the removal of the control variable from further analysis.

Results

Participants

The participating nursing home units had 286 residents. Of the 197 eligible residents, 65 declined to participate (see the flowchart in Figure 1). In addition, the data of four participants were not included in the analyses as they answered fewer than half of the independent variable questions (understanding difficulties $n = 3$, unwilling to continue $n = 1$). This resulted in a final sample of 128 residents, with a mean age of 85.01 years (range 56–101 years, $SD = 6.92$). Most were female (72.7%) and born in the Netherlands (99.2%). The vast majority (75%) had been widowed for an average of 13.45 years ($SD = 12.54$). A minority of the participants (4.7%) had never married, 3.1% were divorced, 17.2% were currently married, and four participants (3.1%) indicated they currently had a partner. Most

Figure 1. Flowchart of participants, dropouts, and imputation.

(88.3%) had children (ranging in number from 1 to 8 children). The majority of participants indicated that they had a religious faith (80.5%), of whom 53.4% experienced their religious faith as “quite supportive” or “very supportive.” Most (64.8%) needed help with bathing and showering, 46.1% needed help with dressing, 29.7% needed help with toileting, 11.7% needed help with standing up from a chair, and only 3.9% needed help with eating. Based on the GDS cutoff score of 2/3 (Jongeneel et al., 2007), 30 residents (23.4%) had an indication for depressive disorder.

Between baseline and T1, 37 respondents dropped out of the study due to death ($n = 11$), cognitive or health problems ($n = 7$), or their choice to discontinue their participation ($n = 19$). No significant differences were found at T0 between dropouts and completers on the sociodemographic variables (location, age, gender, marital status/ having a partner, number of children, or having a religious faith; all p 's $> .15$), and dropouts did not differ significantly from completers on the main independent and dependent variables at baseline (basic psychological needs, depressive feelings, and life satisfaction; all p 's $\geq .08$).

Descriptive Statistics

Means, SD , and correlations of the main variables are presented in Table 1. A one-way repeated-measures ANOVA

with post hoc analyses (paired samples *t* tests) showed that residents had significantly higher satisfaction scores on relatedness ($M = 4.27, SD = 0.58$) and autonomy ($M = 4.18, SD = 0.61$), than on competence ($M = 3.15, SD = 0.81$), Wilks' lambda = 0.37, $F(2, 126) = 107.77, p < .001$. The three basic psychological needs subscales were positively interrelated, with a strong correlation between autonomy and relatedness ($r = .58$), and weak to moderate correlations of competence with relatedness and autonomy ($r = .23$ and $r = .30$ respectively). The balance between the satisfaction scores of the basic psychological needs was highly variable (the balance score ranging from 0.8 to 7.8). The balance score had a weak negative correlation with relatedness ($r = -.23$) and a strong positive correlation with competence ($r = .83$), indicating that the balance score was highly dependent on competence satisfaction scores. Depressive feelings were highly negatively related to life satisfaction ($r = -.71$). Depression scores did not change significantly between baseline ($M = 1.19, SD = 1.70$) and T1 ($M = 1.29, SD = 1.84; F(1,127) = 0.73, p = .40$), nor did satisfaction with life change between baseline ($M = 19.28, SD = 3.98$) and T1 ($M = 19.34, SD = 4.17; F(1,127) = 0.05, p = .82$).

Main Findings

We hypothesized that the satisfaction of the three basic psychological needs would be positively related to subjective well-being across time. The three basic needs satisfaction scales related negatively to depressive feelings and positively to satisfaction with life, with weak to strong correlations (Table 1). These results support the first hypothesis: higher basic need satisfaction scores of all three needs are related to lower depressive feelings and higher satisfaction with life 5–8 months later. Completers-only analyses do suggest, however, that autonomy is especially related to both well-being outcomes as the correlations between relatedness and depressive feelings and between competence and satisfaction with life became nonsignificant.

Regarding the separate basic need satisfaction scales, we hypothesized that each need would have a unique positive relation to subjective well-being later in time. The multiple

regression analysis showed that all three need satisfaction subscales were unique predictors of depressive symptoms at T1 when entered simultaneously into the analysis, but relatedness became a positive predictor of depressive feelings (H2 in Table 2). When data for completers-only were analyzed, autonomy remained a significant predictor of depressive feelings, with both other predictors remaining marginally significantly related to outcomes (autonomy $\beta = -0.57, p > .001$; relatedness $\beta = 0.21, p = .05$; competence $\beta = -0.18, p = .05$). The multiple regression analysis showed that autonomy was the only need that explained unique variance of satisfaction with life in both the imputed data (Table 2) and the completers-only data. The results do not support the second hypothesis: autonomy was the only need that was consistently uniquely related to both well-being measures in combined models.

We also hypothesized that all three needs would have an equally strong positive relation to subjective well-being 5–8 months later. When imputed data were analyzed, autonomy had a significantly stronger correlation ($r = -.55$) with depressive feelings, compared to the moderate correlation of competence with depressive feelings ($r = -.35, z = -2.24, p = .02$) as well as to the weak correlation of relatedness with depressive feelings ($r = -.19, z = -5.00, p < .001$; Table 1). For completers-only, a similar significant stronger relation was found between autonomy and depressive feelings compared to relatedness with depressive feelings ($z = -2.15, p = .03$). The moderate correlation of autonomy with satisfaction with life ($r = .43$) was significantly stronger than the weak correlation of competence with satisfaction with life ($r = .23, z = 2.07, p = .04$) and marginally significantly stronger than the weak correlation of relatedness with satisfaction with life ($r = .29, z = 1.87, p = .06$). For completers-only, autonomy also had stronger correlations with life satisfaction than relatedness with life satisfaction, but this difference was not significant ($z = 1.13, p = .26$). The third hypothesis was rejected: autonomy had the strongest relations to subjective well-being in the imputed dataset.

Finally, we hypothesized that balance among the basic psychological needs would have a positive relation to

Table 1. Means, *SD*, and Correlations of the Basic Needs Satisfaction Scales

	Scale	<i>M</i>	<i>SD</i>	1.	2.	3.	4.	5.
T0 Need satisfaction								
1. Autonomy	1–5	4.18	0.61	—				
2. Relatedness	1–5	4.27	0.58	.58**	—			
3. Competence	1–5	3.15	0.81	.30**	.23**	—		
4. Balance score	0–8	5.30	1.54	-.08	-.23**	.83**		
T1 Well-being								
5. GDS	0–8	1.29	1.84	-.55**	-.19**	-.35**	-.27*	—
6. SWLS	7–25	19.34	4.17	.43**	.29**	.23**	.12	-.71**

Note: GDS = Depressive feelings, SWLS = Satisfaction With Life Scale.

* $p < .05$. ** $p < .01$ (two tailed).

Table 2. Beta's and Additional Explained Variance of the Multiple Regression Models

	GDS T1			SWLS T1		
	H2	H4		H2	H4	
		Step 1	Step 2		Step 1	Step 2
Autonomy	−0.61***	−0.66***	−0.64***	0.36**	0.39***	0.37***
Relatedness	0.21*	0.19*	0.12	0.06	0.07	0.12
Competence	−0.21**	–	–	0.11	–	–
Balance			−0.29***			0.19*
R ² change	.37	.33	.08	.20	.19	.03

Note: GDS = Depressive feelings; H2 = Analysis for Hypothesis 2; H4 = Analyses for Hypothesis 4; SWLS = Satisfaction With Life Scale.

* $p < .05$. ** $p < .01$. *** $p < .001$.

well-being, independent of the amount of basic need satisfaction. Competence was not included as a control variable in Step 1 of the analyses because the competence satisfaction scores correlated highly with the balance score ($r = .83$) and analyses show high VIF scores (9.9 for both GDS and SWLS). The regression analyses showed that the balance score was a significant predictor of both depressive feelings and satisfaction with life beyond autonomy and relatedness, adding 8% and 3% of explained variance, respectively (Table 2). Analyses of completers-only data showed similar results, with the balance score adding 6% and 4% to the explained variance of depressive feelings and satisfaction with life, respectively. These results support the fourth hypothesis: the balance of the satisfaction of the needs is related to subjective well-being, independent of the amount of the satisfaction of the needs for autonomy and relatedness.

Discussion and Implications

The aim of this longitudinal study was to test the longitudinal relations of the satisfaction of the basic psychological needs for autonomy, relatedness, and competence with subjective well-being in a nursing home context. This is the first study to specifically focus on the unique contribution of these needs to both the affective and the cognitive-evaluative components of subjective well-being as well as the first study to test whether relatively equal satisfaction of the three basic psychological needs is important for well-being in this context. As expected, the satisfaction of the three needs was related to well-being measures over time. The current study replicates the past findings of the longitudinal study of Custers and colleagues (2014) showing a relation between the satisfaction of the needs and the affective component of subjective well-being (i.e., depressive feelings) and adds support for the relation to the cognitive-evaluative component of subjective well-being (i.e., satisfaction with life) in a nursing home context. This study is also in line with previous cross-sectional studies of one or more basic psychological needs and subjective well-being of nursing home residents (Custers et al., 2010, 2011, 2013; Kasser

& Ryan, 1999; Vallerand & O'Connor, 1989; Vallerand et al., 1989). The results of the current study also support the SDT statement that the basic psychological needs are important for well-being across one's life span (Ryan & Deci, 2000).

Although all three needs were related to well-being in nursing home residents over time, these relations were stronger with regard to depressive feelings than to satisfaction with life. This finding is in line with previous cross-sectional nursing home research that found general need fulfillment was strongly correlated to depressive feelings and moderately correlated to satisfaction with life (Custers et al., 2010, 2013). Additionally, autonomy was the only need that was uniquely associated with both subjective well-being measures. Autonomy also had the strongest relationship with both subjective well-being measures. It seems that having a sense of choice and volition is of particular importance for residents' well-being. Initial studies of basic psychological needs and well-being in nursing homes also seem to assign special priority to the need for autonomy, as exemplified by the researchers including only this need in their studies (Vallerand & O'Connor, 1989; Vallerand et al., 1989). This emphasis is in line with past research that has assigned great importance to autonomy in care for older adults (e.g., Lyttle & Ryan, 2010).

In the current study, the satisfaction of the need for competence was much lower than the satisfaction of the needs for autonomy and relatedness. It is likely that these lower levels of satisfaction of the need for competence are a primary cause for imbalances in the satisfaction of the different needs. The competence scale had a low reliability in the current sample, and several participants indicated the irrelevance of competence at this stage of their life (e.g., "I can't/don't do anything anymore"). However, the current study revealed that competence was related to both well-being measures and that it had a unique longitudinal relation to depressive feelings. Consequently, even though nursing home residents may not view this need as particularly relevant to their situation, competence is still important for well-being and should therefore be given suitable attention in nursing homes.

Beyond the specific position of the needs for autonomy and competence, the results show that the three basic psychological needs should be considered together. A *balanced* satisfaction of the three needs was found to be important for well-being beyond the *amount* of satisfaction of the basic needs, which supports our Hypothesis 4. This finding corresponds with previous studies that tested this balance hypothesis on students (Sheldon et al., 2009; Sheldon & Niemiec, 2006), and it shows that high satisfaction of one need cannot compensate for low satisfaction of another.

There are some limitations to this study. First, these nursing home residents had higher independence of daily activities, no major cognitive impairments or dementia, and had higher life satisfaction and lower depression scores than others previously reported (Custers et al., 2010, 2011, 2013; Jongenelis et al., 2007), which may limit the generalizability of results. Furthermore, the need for competence subscale had a low reliability; consequently, future research in a nursing home setting should test another potentially suitable questionnaire such as the Balanced Need Satisfaction Scale (Sheldon & Hilpert, 2012).

There were some variances in results between analyses on imputed data and on completers-only data. Overall, the results based on completers-only data seemed to strengthen the general trend in the imputed dataset. Although all three needs are related to subjective well-being of this sample of nursing home residents, autonomy has the strongest and most consistent relationship with the two well-being outcomes. These small differences can be explained by the power differences between both datasets.

It should also be noted that relatedness uniquely predicted depressive feelings when entered in multivariate models, but in the opposite direction to what was expected. Further inspection suggested that this change in direction occurred when both the relatedness scale and the autonomy scale were included in the regression analysis, suggesting that both the strong relationship between these scales and some overlap in content of the items might account for the direction change. Based on this and as the full correlation was negative as expected, we interpreted this primarily as a mathematical artifact of the multiple regression analysis and thus concluded that relatedness did not uniquely explain variance in depressive feelings.

Concerning the balance hypothesis, due to multicollinearity of the competence scale, we could only control for the satisfaction scores of autonomy and relatedness. Other studies using the same analysis method for testing the balance hypothesis for students did not have this problem (Sheldon et al., 2009; Sheldon & Niemiec, 2006). Balance scores in the current sample were highly dependent on the low competence satisfaction scores compared to the higher autonomy and relatedness satisfaction scores, which underlines our previous recommendation that competence should receive special attention in this population.

Despite these limitations, the results largely support the SDT (Ryan & Deci, 2000). The outcomes of this study

can be used both in the culture-change movement and in clinical practice. The six domains of culture change already include two SDT-based psychological needs: *autonomy* (resident direction) and *relatedness* (close relationships; Koren, 2010). Our results support the relation of these two domains for nursing home residents' well-being and provide a theoretical basis for choosing to focus on these specific indicators. The importance of *physical* competence is also widely recognized in elderly care and is embodied in the well-known "use it or lose it" slogan. However, our results show the importance of incorporating the psychological equivalent of physical competence, *feeling* competent or effective, in the list of resident culture-change domains. These three needs are basic and interrelated, and the satisfaction of one need cannot compensate for another. The satisfaction of these three needs should be considered as one unit and be given a central role in culture-change interventions.

In clinical practice, it is highly desirable that support be provided for these three needs. *Relatedness* can be supported by showing warm interest, making conversation, and providing emotional support, whereas the need for *competence* is best supported by encouraging the resident to carry out activities as independently as possible and structuring each situation (Custers et al., 2011). Offering meaningful and favorable choices, while diminishing perceived difficulty associated with those choices supports nursing home residents' *autonomy* (Bangerter, Heid, Abbott, & Van Haitsma, 2017). On a broader level, including nursing home residents in the implementation of culture change efforts and using their expertise is a key opportunity for improving the satisfaction of autonomy, relatedness, and competence, which is often overlooked (Shura, Siders, & Dannefer, 2011).

This current longitudinal study has shown that the satisfaction of all three basic psychological needs is important for the subjective well-being of physically frail nursing home residents and, therefore, these needs should be considered together. Supporting the needs for autonomy, relatedness, and competence should, consequently, have a central role in nursing home culture-change interventions.

Supplementary Material

Supplementary data is available at *The Gerontologist* online.

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Conflict of Interest

None reported.

References

- Baard, P. P., Deci, E. L., & Ryan, R. M. (2004). Intrinsic need satisfaction: A motivational basis of performance and well-being in two work settings. *Journal of Applied Social Psychology*, 34, 2045–2068. doi:10.1111/j.1559-1816.2004.tb02690.x
- Bangerter, L. R., Heid, A. R., Abbott, K., & Van Haitsma, K. (2017). Honoring the everyday preferences of nursing home residents: Perceived choice and satisfaction with care. *The Gerontologist*, 57, 479–486. doi:10.1093/geront/gnv697
- Chen, B., Van Assche, J., Vansteenkiste, M., Soenens, B., & Beyers, W. (2015). Does psychological need satisfaction matter when environmental or financial safety are at risk? *Journal of Happiness Studies*, 16, 745–766. doi:10.1007/s10902-014-9532-5
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Lawrence Earlbaum Associates. doi:10.4324/9780203771587
- Corazzini, K., Twersky, J., White, H. K., Buhr, G. T., McConnell, E. S., Weiner, M., & Colón-Emeric, C. S. (2015). Implementing culture change in nursing homes: An adaptive leadership framework. *The Gerontologist*, 55, 616–627. doi:10.1093/geront/gnt170
- Custers, A. F. J., Cillessen, A. H. J., Westerhof, G. J., Kuin, Y., & Riksen-Walraven, J. M. (2014). Need fulfillment, need importance, and depressive symptoms of residents over the first eight months of living in a nursing home. *International Psychogeriatrics*, 26, 1161–1170. doi:10.1017/S1041610214000659
- Custers, A. F. J., Kuin, Y., Riksen-Walraven, M., & Westerhof, G. J. (2011). Need support and wellbeing during morning care activities: An observational study on resident–staff interaction in nursing homes. *Ageing and Society*, 31, 1425–1442. doi:10.1017/S0144686X10001522
- Custers, A. F. J., Westerhof, G. J., Kuin, Y., Gerritsen, D. L., & Riksen-Walraven, J. M. (2013). Need fulfillment in the nursing home: Resident and observer perspectives in relation to resident well-being. *European Journal of Ageing*, 10, 201–209. doi:10.1007/s10433-013-0263-y
- Custers, A. F. J., Westerhof, G. J., Kuin, Y., & Riksen-Walraven, M. (2010). Need fulfillment in caring relationships: Its relation with well-being of residents in somatic nursing homes. *Ageing & Mental Health*, 14, 731–739. doi:10.1080/13607861003713133
- Dempster, A. P., Laird, N. M., & Rubin, D. B. (1977). Maximum likelihood from incomplete data via the EM algorithm. *Journal of the Royal Statistical Society Series B (Methodological)*, 39, 1–38. doi:10.2307/2984875
- Diener, E., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985). The satisfaction with life scale. *Journal of Personality Assessment*, 49, 71–75. doi:10.1207/s15327752jpa4901_13
- Drageset, J., Kirkevold, M., & Espehaug, B. (2011). Loneliness and social support among nursing home residents without cognitive impairment: A questionnaire survey. *International Journal of Nursing Studies*, 48, 611–619. doi:10.1016/j.ijnurstu.2010.09.008
- Ferrand, C., Martinet, G., & Durmaz, N. (2014). Psychological need satisfaction and well-being in adults aged 80 years and older living in residential homes: Using a self-determination theory perspective. *Journal of Aging Studies*, 30, 104–111. doi:10.1016/j.jaging.2014.04.004
- Gagne, M. (2003). The role of autonomy support and autonomy orientation in prosocial behaviour engagement. *Motivation and Emotion*, 27, 199–223. doi:10.1023/a:1025007614869
- Jongenelis, K., Gerritsen, D. L., Pot, A. M., Beekman, A. T., Eisses, A. M., Kluiter, H., & Ribbe, M. W. (2007). Construction and validation of a patient- and user-friendly nursing home version of the geriatric depression scale. *International Journal of Geriatric Psychiatry*, 22, 837–842. doi:10.1002/gps.1748
- Jongenelis, K., Pot, A. M., Eisses, A. M., Beekman, A. T., Kluiter, H., & Ribbe, M. W. (2004). Prevalence and risk indicators of depression in elderly nursing home patients: The AGED study. *Journal of Affective Disorders*, 83, 135–142. doi:10.1016/j.jad.2004.06.001
- Kasser, V. G., & Ryan, R. M. (1999). The relation of psychological needs for autonomy and relatedness to vitality, well-being, and mortality in a nursing home. *Journal of Applied Social Psychology*, 29, 935–954. doi:10.1111/j.1559-1816.1999.tb00133.x/full
- Koren, M. J. (2010). Person-centered care for nursing home residents: The culture-change movement. *Health Affairs*, 29, 312–317. doi:10.1377/hlthaff.2009.0966
- Lee, I. A., & Preacher, K. J. (2013). Calculation for the Test of the Difference Between two Dependent Correlations with one Variable in Common [Computer software]. Retrieved November 10, 2017, from <http://quantpsy.org>
- Lyttle, D. J., & Ryan, A. (2010). Factors influencing older patients' participation in care: A review of the literature. *International Journal of Older People Nursing*, 5, 274–282. doi:10.1111/j.1748-3743.2010.00245.x
- Myers, R. (1990). *Classical and Modern Regression with Applications* (2nd ed.). Boston: Duxbury.
- Ng, J. Y., Ntoumanis, N., Thøgersen-Ntoumani, C., Deci, E. L., Ryan, R. M., Duda, J. L., & Williams, G. C. (2012). Self-determination theory applied to health contexts: A meta-analysis. *Perspectives on Psychological Science*, 7, 325–340. doi:10.1177/1745691612447309
- Pavot, W., & Diener, E. (1993). Review of the satisfaction with life scale. *Psychological Assessment*, 5, 164–172. doi:1040-3590/93
- Reinboth, M., Duda, J. L., & Ntoumanis, N. (2004). Dimensions of coaching behavior, need satisfaction, and the psychological and physical welfare of young athletes. *Motivation and Emotion*, 28, 297–313. doi:10.1023/B:MOEM.0000040156.81924.b8
- Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *The American Psychologist*, 55, 68–78. doi:10.1037/0003-066X.55.1.68
- Ryan, R. M., & Deci, E. L. (2001). On happiness and human potentials: A review of research on hedonic and eudaimonic well-being. *Annual Review of Psychology*, 52, 141–166. doi:10.1146/annurev.psych.52.1.141

- Ryan, R. M., & Deci, E. L. (2017). *Self-determination theory: Basic psychological needs in motivation, development, and wellness*. New York: The Guilford Press.
- Ryan, R. M., Huta, V., & Deci, E. L. (2008). Living well: A self-determination theory perspective on eudaimonia. *Journal of Happiness Studies*, 9, 139–170. doi:10.1007/s10902-006-9023-4
- Ryan, R. M., & La Guardia, J. G. (2000). What is being optimized over development?: Self-determination theory and basic psychological needs. In S. Qualls & R. Abeles (Eds.), *Psychology and the aging revolution: How we adapt to longer life* (pp. 145–172). Washington, DC: American Psychological Association.
- Sheldon, K. M., Abad, N., & Omoile, J. (2009). Testing self-determination theory via Nigerian and Indian adolescents. *International Journal of Behavioral Development*, 33, 451–459. doi:10.1177/0165025409340095
- Sheldon, K. M., & Hilpert, J. C. (2012). The balanced measure of psychological needs (BMPN) scale: An alternative domain general measure of need satisfaction. *Motivation and Emotion*, 36, 439–451. doi:10.1007/s11031-012-9279-4
- Sheldon, K. M., & Niemiec, C. P. (2006). It's not just the amount that counts: Balanced need satisfaction also affects well-being. *Journal of Personality and Social Psychology*, 9, 331–341. doi:10.1037/0022-3514.91.2.331
- Shier, V., Khodyakov, D., Cohen, L. W., Zimmerman, S., & Saliba, D. (2014). What does the evidence really say about culture change in nursing homes? *The Gerontologist*, 54(Suppl. 1), S6–S16. doi:10.1093/geront/gnt147
- Shura, R., Siders, R. A., & Dannefer, D. (2011). Culture change in long-term care: Participatory action research and the role of the resident. *The Gerontologist*, 51, 212–225. doi:10.1093/geront/gnq099
- Souesme, G., Martinent, G., & Ferrand, C. (2016). Perceived autonomy support, psychological needs satisfaction, depressive symptoms and apathy in French hospitalized older people. *Archives of Gerontology and Geriatrics*, 65, 70–78. doi:10.1016/j.archger.2016.03.001
- Tian, L., Tian, Q., & Huebner, E. S. (2016). School-related social support and adolescents' school-related subjective well-being: The mediating role of basic psychological needs satisfaction at school. *Social Indicators Research*, 128, 105–129. doi:10.1007/s11205-015-1021-7
- Vallerand, R. J., & O'Connor, B. P. (1989). Motivation in the elderly: A theoretical framework and some promising findings. *Canadian Psychology*, 30, 538–550. doi:10.1037/h0079828
- Vallerand, R. J., O'Connor, B. P., & Blais, M. R. (1989). Life satisfaction of elderly individuals in regular community housing, in low-cost community housing, and high and low self-determination nursing homes. *International Journal of Aging & Human Development*, 28, 277–283. doi:10.2190/JQ0K-D0GG-WLQV-QMBN
- Williams, G. C., Gagné, M., Ryan, R. M., & Deci, E. L. (2002). Facilitating autonomous motivation for smoking cessation. *Health Psychology*, 21, 40–50. doi:10.1037//0278-6133.21.1.40