



Sexual Well-Being Across the Lifespan: Is Sexual Satisfaction Related to Adjustment to Aging?

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Abstract

Introduction Sexual satisfaction is relevant to aging well, throughout the lifespan. This study aims to compare the perspectives of sexual satisfaction and adjustment to aging (AtA) in three age cohorts across the lifespan and to analyze whether sexual satisfaction influences the perceptions of AtA.

Methods This cross-sectional study comprised 619 participants from three different age cohorts (18–44, 45–64, and 65+ years). Three measures were used to meet the defined objectives: (a) Adjustment to Aging Scale (ATAS), (b) New Sexual Satisfaction Scale (NSSS-S), and (c) sociodemographic, health, and lifestyle questionnaire. Data were subject to MANOVAs and hierarchical regression analyses.

Results Social support emerged as the most relevant dimension in the multifactorial nature of AtA. Generational differences were found in sense of purpose and ambitions [$F_{(2, 616)} = 14.203, p < .001$], zest and spirituality [$F_{(2, 616)} = 3.175, p = .042$], body and health [$F_{(2, 616)} = 8.732, p < .001$], and social support [$F_{(2, 616)} = 10.646, p < .001$], with participants aged 65 and older showing significantly lower levels in all dimensions. Younger participants showed the highest score for body and health. Age-related decreases in sexual satisfaction were also found, as younger participants showed statistically higher levels of sexual satisfaction, followed by middle-aged and older participants. Sexual satisfaction predicts all the dimensions of AtA, exception made for aging in place and stability. Ego-centered sexual satisfaction positively predicted sense of purpose and ambitions ($\beta = .225, p = .015$) and social support ($\beta = .297, p < .001$), while partner/sexual activity-centered sexual satisfaction was a positive predictor of zest and spirituality ($\beta = .243, p = .010$) and body and health ($\beta = .243, p = .008$).

Conclusions Sexual satisfaction decreases with age and is positively related to dimensions of AtA. Sexual satisfaction is a relevant variable for effective approaches to promoting healthy aging and overall well-being among (older) adults.

Policy Implications Gerontological program policies and interventions with older people would strongly benefit of including sexual satisfaction as a relevant variable for aging well along the lifespan.

Keywords Sexual well-being · Sexual satisfaction · Adjustment to aging · Generational groups · Lifespan

Globally, life expectancy has increased. In fact, the majority of individuals may anticipate living into their 60s and even beyond. The number of older people (aged 65 and above) will rise from 2.2 million to 3.0 million between 2018 and 2080 (World Health Organization, 2022). Additionally, due

to a decline in the young population and an increase in the senior population, Portugal's aging index will nearly quadruple from 159 to 300 older per 100 youth in 2080 (Instituto Nacional de Estatística [INE], 2020). Moreover, research has indicated that the common age of attaining legal adulthood is 18 to 21, middle age as the period of life from about 45 to about 64, and that age 65 is often a convenient cutoff for older age. Despite the fact that this statistic has been moving upward in recent years in western countries, a range between age 60 and 65 for older age seems to be a reasonable metric to use (INE, 2020; WHO, 2022). Opportunities come with living longer, not only for older individuals and their families but also for entire societies (WHO, 2022). Researchers are becoming increasingly conscious that well-being

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involves good physical, mental, and social conditions rather than only the absence of emotional suffering (Hsu, 2020; López et al., 2020).

Adults have sex and partake in genital (e.g., sexual encounters, oral sex), non-genitally oriented (e.g., touching, kissing, hugging), and solitary (e.g., masturbation) behavior across the lifespan (Schwartz & Velotta, 2018). Additionally, 40% of persons aged 65 to 80 are sexually active, and 73% stated that they were satisfied with their current sex life. Furthermore, whether or not they have an active sex life, more than half believe sex plays a vital role in their quality of life, and nearly two-thirds of older individuals are interested in sex (University of Michigan Institute for Healthcare Policy and Innovation, 2018).

In fact, older persons who engage in sexual activity report better levels of well-being (Smith et al., 2019). However, ageist views are among the many psychological and biological factors that affect older persons' sexual expression. Although research on sexuality shows that only a minority of people feel severe pain during a sexual experience, the frequency of sexual dysfunction rises with age (Srinivasan et al., 2019).

Sexual well-being (SWB) has traditionally been less present in the literature, even though it can contribute both directly and indirectly to aging well (Mona et al., 2011). Definitions of SWB vary greatly and usually emphasize sexual issues and dysfunctions (Mona et al., 2011). Nevertheless, sexual satisfaction has been reiterated as central to SWB, as well as positive interpersonal relationships, self-esteem, sexual attraction, and other psychosexual factors (Mona et al., 2011). Other authors pointed out sexual satisfaction, sexual desire, and sexual functioning in intimate and relational circumstances as relevant to SWB (Rosen & Bachmann, 2008). In relation to this, the Interpersonal Exchange Model of Sexual Satisfaction (IEMSS) highlighted sexual satisfaction in the relational contexts, rather than as an evaluation of individual sexual experiences. Communication, sexual compatibility, and relationship satisfaction seem to contribute to greater sexual satisfaction. Conversely, desire discrepancies and sexual dysfunction are common attenuators of sexual satisfaction (Freihart et al., 2020). Indeed, sexual satisfaction is related to relationship satisfaction, as well as life satisfaction, and is relevant to intimate romantic relationships (Smith et al., 2019). Both men and women reported feeling more satisfied with their lives when they engaged in sexual activity and felt emotionally close to their partners while doing so (Smith et al., 2019). Furthermore, research indicates that older adults are not asexual and that experiencing sexual satisfaction, hassle-free sexual activities, contributes to their SWB and overall well-being (Smith et al., 2019).

Despite ageist prejudices that believe sexual expression stops around middle age, sexual satisfaction and SWB are essential to well-being throughout the lifespan (Syme et al., 2019). Yet, a dysfunction-based narrative, a lack of a

sex-positive aging paradigm, and current metrics that are age-inappropriate and scope-restricted make it difficult to conceptualize sexual variables, such as SWB and sexual satisfaction across the lifespan, particularly in later life (Syme et al., 2019). Sexual satisfaction and SWB may promote healthy aging, physical activity, cardiovascular benefits, relaxation, and lower pain sensitivity (through physical, emotional, psychological, and social factors) (Brody, 2010; Laumann et al., 2006); decreased levels of depression; and better quality of life, self-esteem, and well-being (Trudel et al., 2010).

Across the lifespan, young, middle-aged, and older individuals' interest in sex, frequency of sex, quality of sex life, and overall health are all positively correlated with sexual activity, sexual partnership, and frequency of sex (Lindau & Gavrilova, 2010). Literature indicated that for the younger cohorts, frequent sexual activity can greatly impact individual physical and mental health and well-being (Lee, Nazroo, et al., 2016a; Syme, 2014; von Humboldt & Leal, 2014, 2015, 2017), and it appears to offer a number of health advantages for older groups (DeLamater, 2012; Syme, 2014). Additionally, for the younger adults, engaging sexually with the partner increased well-being, but only when it was motivated by the well-being of both partners or by promoting the intimacy of the relationship (Gómez-López et al., 2019). Both younger and older adult sexual activity is associated with higher life satisfaction, quality of life, subjective well-being, and sexual health (Lee, Nazroo, et al., 2016; Lee, Vanhoutte, et al., 2016; Smith et al., 2019; Træen, Carvalheira, et al., 2019; Træen, Štulhofe, et al., 2019). However, literature shows that achieving SWB in later adulthood is more challenging than for younger cohorts (Kleinstäuber, 2017). In relation to this, the ability to achieve sexual satisfaction, without fear of pressure, humiliation, or prejudice, is a crucial component of aging well and overall life satisfaction (Simpson et al., 2017; Syme et al., 2019). In this sense, it is crucial to approach the discussion of sexual activity and intimacy as integral components of overall well-being for adults across the lifespan. This approach offers valuable perspectives on SWB, which can, in turn, assist adults, including the emerging generations, in effectively managing and addressing the diverse dimensions of growing older (Træen & Villar, 2020).

Although Portuguese men stated that age was a barrier to being sexually active when they are chronologically older, they had favorable opinions regarding sex as being beneficial for older individuals' well-being. Portuguese women did not see becoming older as a barrier to enjoying their sexuality since they thought it was beneficial for their well-being (Træen, Carvalheira, et al., 2019; Træen, Štulhofe, et al., 2019). Furthermore, the aging process raises the incidence of sexual disorders while decreasing the frequency of sexual engagement. However, it is probable that sexually active men and women have more favorable aging characteristics and less

chronic illnesses, hence more enjoyment of life (Smith et al., 2019; Syme, 2014). Men's decrease in sexual desire and women's reduction in the frequency of their sexual activities were both linked to reduced life satisfaction. Furthermore, there is a strong correlation between increased depressive symptoms, a worse quality of life, and a lower level of life satisfaction and decline in erectile function in males and sexual arousal in women (Jackson et al., 2019).

In order to adjust to aging, older people must be able to preserve a strong sense of self-purpose, in the face of the changes that come with growing older (Atchley, 1999). The flexible use of adaptive techniques to enhance one's functioning and well-being within the limitations of one's own competence and resources has been described as adjustment to aging (AtA) (von Humboldt, Low, et al., 2020).

AtA encompasses biological, emotional, and physical factors that result from adaptive self-regulation of frequent age-related difficulties (von Humboldt, Leal, Pimenta, 2013; von Humboldt, Leal, Pimenta, Niculescu, 2013). Indeed, AtA incorporates several components, such as sense of purpose and ambitions, zest and spirituality, body and health, aging in place and stability, and social support (von Humboldt, Low, et al., 2020; von Humboldt, Ribeiro-Gonçalves, et al., 2020). It includes a dynamic relationship between self-determination, self-control, acceptance of oneself, personal development, a supportive social network, and a sense of purpose (von Humboldt, Leal, Pimenta, Niculescu, 2013). Goals and abilities are balanced via emotional control and self-efficacy in relation to aging and health concerns, which is part of AtA. In fact, AtA is important for facilitating healthy aging and, ultimately, for aging well (von Humboldt, Low, et al., 2020, 2021; von Humboldt, Ribeiro-Gonçalves, et al., 2020). According to the literature, older individuals' capacity to adjust is a significant factor in predicting outcomes, including physical health and disability, mental health, functional status, and autonomy (von Humboldt et al., 2021).

Less studied, yet crucial, the relationship between AtA and SWB is relevant for overall health and well-being. For older adults, sexuality is a significant aspect of life, and research reiterated the variety of sexual expression after middle life (Wang et al., 2015). It is commonly known that maintaining an active sexual life has several advantages for AtA. Moreover, sexual satisfaction and regular sexual activity have been linked to greater mental and physical health, with positive implications in AtA (DeLamater, 2012; von Humboldt et al., 2021), including improved well-being, cardiovascular health, decreased levels of depression, lower death rates, and increased relationship satisfaction (Brody, 2010; Lindau & Gavrilova, 2010). In contrast, lower levels of sexual activity and greater levels of sexual issues (such as erectile dysfunction, a fall in desire, and arousal) have been linked to poor physical health and chronic health diseases like diabetes and arthritis (Lee, Nazroo, et al., 2016; Tetley et al., 2018; Towler et al., 2021 von Humboldt, Leal, Santos, et al., 2013).

Literature has demonstrated the intricate interplay between relationship, lifestyle, and health factors, which may influence sexual satisfaction and AtA along the life cycle. Health professionals must consider each person's lifestyle, needs, and preferences while addressing healthy aging (Erens et al., 2019). Moreover, as the older population continues to rise, understanding the relationship between AtA and sexual satisfaction will be crucial in the coming years (von Humboldt, Low, et al., 2022; von Humboldt, Rolo, et al., 2022). There is a lack of a body of knowledge that focuses on SWB, sexual satisfaction, and AtA across the lifespan, and up to date, there is no study comparing these variables in different age cohorts. This study intends to fill this gap in the literature. Hence, it aims (1) to compare sexual satisfaction and AtA in three different age cohorts (18–44, 45–64, and 65+ years) across the lifespan and (2) to analyze whether sexual satisfaction influences the perceptions of AtA.

Method

Participants

A total of 619 Portuguese individuals participated in this study, aged between 18 and 92 years old ($M=47.53$; $SD=18.34$). Participants' sociodemographic characteristics are displayed in Table 1.

All participants were 18 years old or older and lived in the community. As the questionnaire was individually and voluntarily answered online, participants were assumed to be in good health and cognitive conditions. In fact, when reporting on their health and lifestyle, 88.2% of participants

Table 1 Sociodemographic characteristics of the participants

Characteristics	Frequency (n)	Percentage (%)
Total (overall)	619	100
<i>Gender</i>		
Male	260	42.0
Female	359	58.0
<i>Age group</i>		
18–44 years	251	40.5
45–64 years	218	35.2
65+ years	150	24.2
<i>Educational level</i>		
< Secondary	175	28.3
Secondary	223	36.0
> Secondary	221	35.7
<i>Marital status</i>		
Single	182	29.4
Married/de facto union	331	53.6
Divorced/separated	63	10.2
Widow	41	6.6

answered feeling in good health conditions. Only 13.6% of participants reported having recently had a psychological problem, the large majority of these being related to anxiety and/or depression. Also, 85.0% of participants reported not having received recently any type of pharmacological therapy or psychotherapy.

Most participants (72.1%) reported being in a relationship and the majority being heterosexual (64.3%), with only 3.2% reporting being homosexual. A considerable amount of participants (32.5%) preferred not to report on their sexual orientation.

Materials

Adjustment to Aging Scale (ATAS)

Adjustment to aging was assessed with the Adjustment to Aging Scale (AtAS; von Humboldt et al., 2014), which assesses the factors that adults recognize as indicators of their AtA. The five factors of AtA were considered: (1) sense of purpose and ambitions, (2) zest and spirituality, (3) body and health, (4) aging in place and stability, and (5) social support. A 7-point Likert-type scale was used to group the responses into categories, in which 1 is *not at all important* and 7 is *very important*. Scores for each dimension are generated by scoring the mean value of all items in that dimension. The validation study showed good psychometric properties in different samples, suggesting it serves as a suitable cross-cultural tool for study, clinical use, and health program creation (von Humboldt & Leal, 2014). A high reliability of the data was established by the scale's internal consistency, as well as its five subscales: the internal consistency by Cronbach's alpha obtained for the total scale was 0.891 and for the five scales mentioned above was 0.874, 0.927, 0.904, 0.862, and 0.932, respectively (von Humboldt et al., 2014).

New Sexual Satisfaction Scale (NSSS-S)

Sexual satisfaction was assessed with the Portuguese version (Pechorro et al., 2016) of the New Sexual Satisfaction Scale and Its Short Form (NSSS-S; Brouillard et al., 2019; Štulhofer et al., 2010). NSSS-S is a 12-item scale with a two-dimensional factor structure: subscale A, also known as the Ego-Centered subscale, and subscale B, also known as the Partner/Activity-Centered subscale. The NSSS-S is composed of 5-point ordinal categories, where 1 is the *not at all satisfied* and 5 is the *completely satisfied*. The overall NSSS-S score is acquired by adding the scores for all items, and the scores for each dimension are generated by adding the scores for each item in that dimension. Significantly higher ratings on the scale are associated with higher levels of sexual satisfaction. NSSS-S has demonstrated strong psychometric qualities, including an internal consistency by Cronbach's alpha of 0.94 in the Portuguese version (Pechorro et al., 2016).

Sociodemographic, Health, and Lifestyle Questionnaire

Background questions about the participants' living situation, health, age, nationality, education, family, and lifestyle were performed. Descriptive statistics were used to characterize the sample.

Procedure

Every participant received the study information and was required to fill out an informed consent form. Participants responded to an online questionnaire (Google Forms), and telephone or online support was available. The link to the questionnaire was disseminated by email and social/personal networks to achieve a wider and varied sample. Participants were informed that their participation was completely optional and that they might quit at any time. Confidentiality and anonymity of the data were assured. Data collection was performed between October 1 and December 30, 2021. All procedures were approved by the Research Ethics Committee of the William James Center for Research and ISPA—Instituto Universitário. The Helsinki Declaration on ethical criteria for human subjects' research, as well as the Portuguese Psychologists' Code of Ethics, was followed. After completing the questionnaires, participants were not compensated.

Data were first explored through descriptive, correlational, and multivariate analyses of variance (MANOVA). Pearson correlations were computed to explore the associations between sexual satisfaction and adjustment to aging. Multivariate analyses of variance (MANOVAs) were performed to explore group differences in adjustment to aging, taking relationship status (being in a relationship vs. not being in a relationship) and sexual activity with partner (having an active sexual life with partner vs. not having an active sexual life with partner) as independent variables. Age effects were also explored with dimensions of adjustment to aging and sexual satisfaction as dependent variables and generational age cohorts (18–44 years of age, 45–64 years of age, and 65 years of age and older) as independent variable. MANOVAs were used to decrease the chance of Type I error associated with multiple significance testing with correlated outcome variables. Identified differences were further explored with univariate tests. Tukey's HSD test was used for post hoc comparisons.

Prior to the exploration of the relations between sexual satisfaction and adjustment to aging, tolerance and variance inflation factors (VIFs) of the independent variables were examined to test for potential multicollinearity among variables. VIF values that exceed 10 and tolerance values that are less than 0.1 indicate potential multicollinearity problems (Hair et al., 2010). Since the observed values of tolerance ranged between 1.63 and 0.930 and those of VIF between 1.076 and 6.122, no severe problems regarding multicollinearity were found. Hierarchical linear regression was used to

assess the relations of sexual satisfaction and adjustment to aging. After identifying the effects of age, relationship status (being in a relationship vs. not being in a relationship), and sexual life with partner (having an active sexual life with partner vs. not having an active sexual life with partner) on participants' adjustment to aging, these independent variables were controlled in the regression model, with predictors being input in blocks.

Statistical analyses were performed with the Statistical Package for the Social Sciences (SPSS version 27), and results with $p < .05$ were considered statistically significant.

Results

Preliminary Analysis: Descriptive, Correlational, and Differential Analyses

Table 2 shows the means, standard deviations, and inter-correlations of the measured variables. Although all factors concerning AtA are generally considered important, participants value social support as the most significant factor, with the highest score. Participants showed close to average levels on the two sexual satisfaction factors. AtA and sexual satisfaction are positively correlated, with correlations ranging between 0.22 and 0.91, $p < .001$.

The MANOVA identified a significant multivariate effect of relationship status (being in a relationship vs. not being in a relationship) on sexual satisfaction [Wilk's $\Lambda = .892$; $F(5, 613) = 14.774$, $p < .001$; partial $\eta^2 = .108$]. Further, ANOVA analyses showed significant differences between means in all AtA dimensions: sense of purpose and ambitions [$F(1, 617) = 9.359$, $p = .002$; partial $\eta^2 = .015$], zest and spirituality [$F(1, 617) = 13.456$, $p < .001$; partial $\eta^2 = .021$], body and health [$F(1, 617) = 5.846$, $p = .016$; partial $\eta^2 = .009$], aging in place [$F(1, 617) = 11.647$, $p = .001$; partial $\eta^2 = .019$], and social support [$F(1, 617) = 47.337$, $p < .001$; partial $\eta^2 = .071$]. Participants in a relationship reported significantly higher levels of adjustment to aging when compared to those not being in a relationship.

In addition, a multivariate effect of sexual activity with partner (having an active sexual life with partner vs. not having an active sexual life with partner) was found in adjustment to aging [Wilk's $\Lambda = .903$; $F(10, 1224) = 6.375$, $p < .001$; partial $\eta^2 = .050$]. Again, subsequent univariate tests showed significant differences between means in all AtA dimensions: sense of purpose and ambitions [$F(1, 617) = 11.355$, $p < .001$; partial $\eta^2 = .036$], zest and spirituality [$F(1, 617) = 9.538$, $p < .001$; partial $\eta^2 = .030$], body and health [$F(1, 617) = 8.508$, $p < .001$; partial $\eta^2 = .027$], aging in place [$F(1, 617) = 7.688$, $p < .001$; partial $\eta^2 = .024$], and social support [$F(1, 617) = 26.593$, $p < .001$; partial $\eta^2 = .079$]. Participants with an active sexual life with partner reported significantly higher levels of adjustment to aging when compared to those not having an active sexual life with partner.

A small main effect of family income (low vs. moderate vs. high) on adjustment to aging [Wilk's $\Lambda = .967$; $F(10, 1180) = 2.001$, $p = .030$; partial $\eta^2 = .017$] was identified, although further ANOVA analyses showed no significant difference in any of AtA dimensions.

Adjustment to Aging and Sexual Satisfaction: Differences Between Age Groups

A MANOVA was used to compare age groups across dimensions of adjustment to aging and sexual satisfaction. A significant multivariate effect of age group was found [Wilk's $\Lambda = .743$; $F(14, 1220) = 13.962$, $p < .001$; partial $\eta^2 = .138$], indicating different levels of adjustment to aging and sexual satisfaction between age groups. Subsequent univariate tests illustrate that generational differences are found in sense of purpose and ambitions [$F(2, 616) = 14.203$, $p < .001$], zest and spirituality [$F(2, 616) = 3.175$, $p = .042$], body and health [$F(2, 616) = 8.732$, $p < .001$], social support [$F(2, 616) = 10.646$, $p < .001$], ego-centered sexual satisfaction [$F(2, 616) = 71.707$, $p < .001$], and partner/activity centered [$F(2, 616) = 72.114$, $p < .001$]. Tukey post hoc tests revealed that older participants scored lower in all these dimensions when compared to young and middle-aged participants. Table 3 displays the results of age group comparisons in adjustment to aging and sexual satisfaction.

Table 2 Descriptive statistics and correlations between adjustment to aging and sexual satisfaction

	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7
1. AtAS_Sense of purpose and ambitions	5.86	1.32	(.92)						
2. AtAS_Zest and spirituality	5.76	1.24	.82***	(.85)					
3. AtAS_Body and health	5.95	1.28	.81***	.83***	(.91)				
4. AtAS_Aging in place and stability	5.90	1.24	.76***	.83***	.82***	(.89)			
5. AtAS_Social support	6.02	1.40	.75***	.75***	.78***	.79***	(.88)		
6. NISS-S_Ego-centered	3.63	1.13	.35***	.31***	.37***	.22***	.45***	(.96)	
7. NISS-S_Partner/activity-centered	3.53	1.13	.37***	.32***	.38***	.29***	.44***	.91***	(.95)

Cronbach's alpha coefficients are presented in diagonal

*** $p < .001$

Table 3 Adjustment to aging and sexual satisfaction: Descriptives per age group and univariate tests

	18–44 years	45–64 years	≥ 65 years		
	Mean (SD)	Mean (SD)	Mean (SD)	<i>F</i>	<i>p</i>
<i>Adjustment to aging</i>					
Sense of purpose and ambitions	6.113 (1.067) <i>a</i>	5.889 (1.320) <i>a</i>	5.405 (1.557) <i>b</i>	14.203	<.001
Zest and spirituality	5.837 (1.033) <i>a</i>	5.823 (1.259) <i>a</i>	5.540 (1.489) <i>b</i>	3.175	.042
Body and health	6.177 (1.091) <i>a</i>	5.911 (1.314) <i>ab</i>	5.636 (1.458) <i>b</i>	8.732	<.001
Aging in place and stability	5.872 (1.108)	5.979 (1.2627)	5.817 (1.417)	.833	.435
Social support	6.259 (1.245) <i>a</i>	6.030 (1.356) <i>a</i>	5.602 (1.605) <i>b</i>	10.646	<.001
<i>Sexual satisfaction</i>					
Ego-centered	4.061 (.918) <i>a</i>	3.710 (.989) <i>b</i>	2.809 (1.207) <i>c</i>	71.707	<.001
Partner/activity-centered	3.950 (.980) <i>a</i>	3.627 (.980) <i>b</i>	2.702 (1.179) <i>c</i>	72.114	<.001

Measures marked with different letters differ statistically between age categories, at the level of $\alpha < .05$, according to the Tukey HSD test

Adjustment to Aging: Age and Sexual Satisfaction as Predicting Factors

Three-stage hierarchical multiple regressions were conducted to determine whether age and sexual satisfaction

incrementally predicted factors of AtA. Overall, independent variables were associated with substantial variation toward AtA (Table 4). Control variables were entered first (Model 1), then control variables and ego-centered sexual satisfaction (Model 2), and finally control variables, ego- and

Table 4 Adjustment to aging, age, and sexual satisfaction: Results of hierarchical regression analysis

	F1. Sense of purpose and ambitions	F2. Zest and spirituality	F3. Body and health	F4. Aging in place and stability	F5. Social support
<i>Model 1</i>					
Age	-.205***	-.071	-.165***	.006	-.172***
In a relationship	.073	.088	.046	.068	.199***
Having sex with partner	.111*	.112*	.108*	.119*	.143***
<i>R</i> ²	.075	.038	.052	.027	.124
<i>R</i> ² Δ	.075	.038	.052	.027	.124
<i>F</i>	16.477***	7.998***	11.101***	5.740***	28.929***
<i>Model 2</i>					
Age	-.074	.050	-.023	.093*	-.018
In a relationship	.033	.051	.003	.041	.153***
Having sex with partner	-.029	-.017	-.044	.027	-.022
Ego-centered sexual satisfaction	.349***	.321***	.377***	.230***	.408***
<i>R</i> ²	.146	.098	.135	.058	.222
<i>R</i> ² Δ	.071	.061	.083	.031	.098
<i>F</i>	26.178***	16.656***	23.812***	9.477***	43.564
<i>Model 3</i>					
Age	-.065	.066	-.007	.103*	-.010
In a relationship	.027	.041	-.006	.035	.147***
Having sex with partner	-.033	-.023	-.050	.023	-.025
Ego-centered sexual satisfaction	.225*	.113	.168	.095	.297***
Partner/activity-centered	.145	.243*	.243**	.158	.129
<i>R</i> ²	.150	.108	.145	.062	.224
<i>R</i> ² Δ	.004	.010	.010	.004	.003
<i>F</i>	21.498***	14.794***	20.646***	8.142***	35.359***

Standardized coefficients are displayed in the table

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

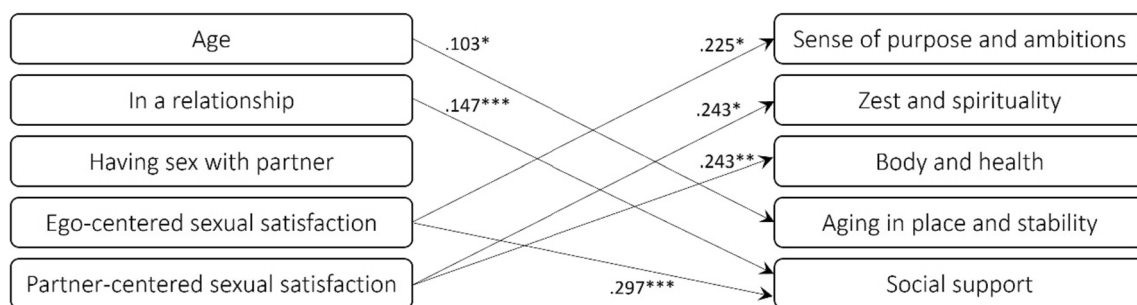


Fig. 1 Diagram of the relations between sexual satisfaction and adjustment to aging (Model 3). Note: * $p < .05$, ** $p < .01$, *** $p < .001$. Values are standardized coefficients. Non-significant paths have been omitted for clarity

partner/activity-centered sexual satisfaction (Model 3). Focus is herein provided on Model 3, where all variables are considered. Age was a positive predictor of aging in place and stability ($\beta = .103$, $p = .024$), and being in a relationship positively predicted social support ($\beta = .147$, $p < .001$). Also, ego-centered sexual satisfaction positively predicted the importance given to sense of purpose and ambitions ($\beta = .225$, $p = .015$) and to social support ($\beta = .297$, $p < .001$) in AtA, while partner/activity-centered sexual satisfaction was a positive predictor of the importance given to zest and spirituality ($\beta = .243$, $p = .010$) and body and health ($\beta = .243$, $p = .008$) in AtA. A diagram of results (Model 3) is presented in Fig. 1.

Discussion

Sexual health has been defined as the continuing process of social, psychological, and physical well-being associated to sexuality (Pan American Health Organization [PAHO], WHO, World Association for Sexology [WAS], 2000). Adults show the ability to express their sexuality freely and responsibly, beyond being free from dysfunction and/or disability, which promotes societal harmony and individual and social well-being (PAHO et al., 2000). Although the importance of sexuality for well-being has been recognized, a more profound understanding of sexual satisfaction and AtA across the lifespan is still lacking. The purpose of the present study was to contribute to research, by comparing the perspectives of sexual satisfaction and AtA across three distinct age groups across the lifespan and by assessing the relation between sexual satisfaction and AtA.

Aging is an enduring process, requiring continuous adjustment to changes regarding aging and adjustment capacity. The construct of AtA has been theoretically proposed as a multifactor adjustment process with implications on well-being, health, and adapted functioning (von Humboldt et al., 2014). Consistent with such a perspective, our findings indicated that participants recognized

the multidimensional nature of AtA. In particular, these participants pointed social support, such as sharing intimacy with a partner and being cherished by family, as the most relevant factor for AtA, underlining growing evidence that suggests the importance of social connectivity and support for well-being and aging well (Czaja et al., 2021; Domenech-Abella et al., 2019; Read et al., 2020). These findings also revealed the importance of sense of purpose, zest and spirituality, and aging in place for these participants. Growing literature highlights sense of purpose and accomplishment as pertinent along the lifespan, as it has been associated to positive attitudes, with improved mental and physical health outcomes (Musich et al., 2018; Windsor et al., 2015), as with better cognitive function and lower dementia risk (Sutin et al., 2021). Similarly, implications of spirituality and of aging in place for aging well have been found in the literature. Indeed, being spiritual has been associated with positive beliefs, such as gratitude, faith, and tranquility (Lima et al., 2020), and aging in place with positive attitudes, sense of belonging, peacefulness, and community integration (Smith et al., 2018; Staudinger & Kunzmann, 2005).

Although the importance of multiple factors for AtA is largely acknowledged by participants of our study, a pattern emerges from a more in-depth analysis of cross-group comparisons: when compared to younger generations, participants aged 65 and older evidence significantly lower levels of importance attributed to sense of purpose, zest and spirituality, body and health, and social support. Indeed, purpose in life has been pointed as an indicator of healthy aging for several reasons, including its potential for reducing mortality risk (Hill & Turiano, 2014; Shiba et al., 2022) and for contributing to healthy behaviors (Kim et al., 2020). Additionally, research indicated that several factors influence the degree to which individuals report a strong purpose in life, including a higher socioeconomic status, good physical and mental health, and being of younger age (Shiba et al., 2022). Younger participants with clear goals and purpose seem to look into the future with some expectation of accomplishing

meaningful goals. Given that individuals' goals and the amount of perceived time remaining in life differ with age, potential changes to purpose in life and goals achievement across the lifespan might be expected (Hill & Turiano, 2014; Shiba et al., 2022). Additionally, normative transitions in old age, such as from work to retirement, may compromise sense of purpose and contribute to increased health risks (Shiba et al., 2022). Indeed, while experiencing psychological distress from the transition to retirement (Lahdenperä et al., 2022), older individuals are more probable to experience age-related diseases, such as hearing and vision loss, cardiovascular disease, diabetes, and other chronic conditions (Jaul & Barron, 2017).

Sexual satisfaction is increasingly recognized as an important component of well-being throughout the life course and for maintaining relationships, promoting self-esteem, and contributing to health (Wellings & Johnson, 2013) in a relational context (IEMS; Freihart et al., 2020). In line with previous research, these findings show that sexual satisfaction, both ego- and partner/sexual activity-centered satisfaction, changes with increasing age. Indeed, age-related decreases in sexual satisfaction have been previously shown in a large number of studies (Lee, Vanhoutte, et al., 2016; Lindau et al., 2007; Thomas et al., 2015; Trompeter et al., 2012). Even though the relationship between sexuality and aging well has often been overlooked, a study has found a positive link between sexual satisfaction and aging well among older European couples (Štulhofer et al., 2019). In this sense, these findings suggest that sexual satisfaction may play a pivotal role in AtA, and in particular to the social support dimension of AtA, by contributing to the relationship quality, self-esteem, and emotional regulation (Freihart et al., 2020; Jaul & Barron, 2017; von Humboldt et al., 2014). However, this discussion is still limited by a scarcity of empirical research on the relationship between sexual satisfaction, AtA, and aging well.

All models showed to be significant; therefore, independent variables were related to AtA with variation. In Model 1, age was negatively related to three dimensions of AtA: sense of purpose and ambitions, body and health, and social support. Literature highlighted challenges in the aging process along the life cycle; hence, not surprisingly, data from Model 1 indicated the inverse relation between age and AtA (von Humboldt & Leal, 2014; von Humboldt et al., 2014).

When sexual satisfaction was introduced in Model 3, results indicated that ego-centered sexual satisfaction was positively related to sense of purpose and ambitions ($\beta = .349$, $p < .001$) and to social support ($\beta = .297$, $p < .001$), while being in a relationship was also positively related to social support ($\beta = .147$, $p < .001$). Indeed, sense of purpose and social support have long been relevant concepts in lifespan research. These have been viewed as relevant dimensions of AtA, a dynamic, life-course process whereby early

experiences contribute to coping with challenges in later life (Schmidt & Matthiesen, 2003; Slagsvold & Strand, 2005). In this context, younger adults are likely to have positive beliefs and attitudes on sexuality, which may contribute to higher sense of purpose and ambitions and to social support (Prairie et al., 2011). Additionally, in comparison to older generations, younger individuals are expected to place greater value in their sexual satisfaction (Schmidt & Matthiesen, 2003; Slagsvold & Strand, 2005). Literature suggested that participating in satisfying intimate activities was linked to meaningful social support and higher sense of purpose (Prairie et al., 2011; von Humboldt et al., 2014). These results are in line with the view of sexual satisfaction in a relational context as indicated in IEMSS (Freihart et al., 2020) and the importance of significant relationships along the lifespan (Carstensen et al., 2020; Freihart et al., 2020).

Interestingly, partner/sexual activity-centered sexual satisfaction was a positive predictor of zest and spirituality ($\beta = .243$, $p = .010$) and body and health ($\beta = .243$, $p = .008$). Indeed, literature highlighted that a sexual satisfaction can facilitate a satisfactory spiritual life and promote attitudes of gratitude and beliefs on a holist perception of love (Cranney, 2020; Dew et al., 2020). Moreover, social support, relationship satisfaction, well-being, and mental health are influenced by sexual satisfaction during partnered sexual activity (Freihart et al., 2020; May & Johnston, 2022), and perceived partner support was discovered to be a significant predictor of self-reported sexual satisfaction among a large random community sample (Freihart et al., 2020; Ojanlatva et al., 2006). Considering that older adults value significant emotional relationships, sexual satisfaction is central for the development for meaningful and deep relationships in old age, and therefore AtA (Carstensen et al., 2020).

Limitations and Future Research

This study encompasses a number of limitations. Despite having a diverse sample of participants, the sample is not representative of the whole population, and results cannot be generalized to other populations. Furthermore, this study may have not fully captured the complexity of the relationship between these themes and may have excluded the experiences of people who show different sexual identities. Data only reveal the perspectives of these participants, in order to explore the untapped potential of sexual satisfaction and AtA. Self-report bias is a further limitation, since it is possible for participants to not be totally truthful when answering questions on sensitive subjects, such as sexual satisfaction. The association between sexual satisfaction and AtA may also be influenced by other variables, including one's general state of health, relationship quality, and sexual frequency and functioning.

Contribution and Implication of Findings

The results of the present study may be helpful for public health professionals in developing and putting into practice future programs to support older people's sexual health and well-being. Knowledge encompassing AtA and sexual satisfaction could have an impact on the emergence of interventions and programs that support older individuals' sexual health and well-being. Additionally, these findings might be utilized to build educational resources for healthcare professionals that promote older persons' sexual satisfaction and its influence on AtA. Conversely, future studies may explore the influence of AtA on sexual satisfaction across the lifespan. The importance of sexual satisfaction for AtA and the differences found across the lifespan on which sexual satisfaction influenced different dimensions of AtA may be used for interventions within couple's therapy or sex education programs (May & Johnston, 2022; Schwartz & Velotta, 2018), and in the formulation of program policies, in particular when concerning decisions on sexual health promotion or prevention (e.g., intimacy satisfaction, protected sex, contraception, sexually transmitted diseases, and sexual dysfunction) (von Humboldt, Leal, Pimenta, 2013; von Humboldt, Leal, Pimenta, Niculescu, 2013; von Humboldt, Low, et al., 2020).

This study highlighted the importance of considering SWB and AtA in social policies and interventions across the lifespan. Social support, a key factor in AtA, showed generational differences, with older participants reporting lower levels of certain AtA dimensions. Simultaneously, age-related decreases in sexual satisfaction were evident, with younger participants reporting higher levels. These results underscore the relevance of addressing SWB to enhance healthy aging and overall well-being, suggesting that integrating sexual satisfaction as a relevant variable to AtA can lead to more effective community interventions and program policies.

Despite the relevance of sexual satisfaction and well-being across the lifespan, older people's sexual health has received insufficient public health attention. Our aim is that these results, as well as those from comparable research, will contribute to the evidence required to address this pertinent subject. Moreover, these results could help to shed light into the pertinence of SWB across the lifespan, and particularly, by disputing adverse stereotypes, negative beliefs and attitudes toward sexuality in older persons. These findings show that age-appropriate interventions and support networks are required to improve sexual health in different generations across the lifespan. By recognizing and attending to different cohort needs, healthcare professionals and governments may eventually enhance the sexual health and overall AtA across the lifespan. In relation to this, there are still gaps in the literature, when it comes to communicating sexual concerns between healthcare professionals and their clients. Although sexual issues are fairly common, a large

number of older people in their 70 s and 80 s still engage in sexual activity. Healthcare practitioners should be proactive in delivering treatment and counseling to older individuals who have sexual health difficulties. Future studies should take into account the fact that interactions between SWB and AtA are frequently more complex than anticipated and that various aspects of AtA are affected differently.

Conclusion

For the first objective, this study found generational differences related with AtA dimensions. Older people showed significantly lower levels of sense of purpose and ambition, zest and spirituality, body and health, and social support, while younger participants showed the highest scores for body and health. Concerning the second objective, findings indicated age-related decreases in sexual satisfaction and that sexual satisfaction predicted all the dimensions of AtA, except for aging in place and stability. Additionally, age is the main predictor of aging in place. Moreover, this study stressed the importance of ego-centered sexual satisfaction to the sense of purpose and ambitions and social support and the relevance of partner/sexual activity-centered sexual satisfaction to zest and spirituality, body and health, and social support across the lifespan. These results are central to help us better understand the connection between sexual satisfaction and AtA along the life cycle, which might have an impact on how society views the process of aging and sexuality. Moreover, this study highlighted the need for a broader awareness and support for sexual health across generations, recognizing that sexual satisfaction is relevant for AtA across the lifespan.

As this research contributes to the discussion about the intricate link between sexual satisfaction and well-being, it has the potential to foster a more positive and inclusive view on aging and sexuality, thereby challenging prevailing stereotypes, negative beliefs, and attitudes. Ultimately, this study contributes to a broader understanding of how sexual satisfaction influences AtA across different generations, setting the stage for continued exploration of this vital topic.

Authors Contribution IM: study concept and design, analysis, and interpretation of data; recruitment of subjects; and preparation of manuscript; SVH: study concept and design, analysis, and interpretation of data; and preparation of manuscript; and IL: study concept and design and interpretation of data.

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Data Availability The data that support the findings of this study are available from the corresponding author [IM], upon reasonable request.

Declarations

Ethics Approval and Consent to Participate The study was conducted according to the guidelines of the Declaration of Helsinki

and the Portuguese Psychologists' Code of Ethics. The study did not involve experimental protocols. Informed consent was obtained from all subjects.

Consent for Publication Not applicable.

Competing Interests The authors declare no competing interests.

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