



Patterns of Sexuality, Adjustment to Aging and Satisfaction with Life: A Cluster Analysis of Adults Across the Lifespan

Sofia von Humboldt¹ · Isabel Miguel² · Gail Low³ · Isabel Leal¹

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Abstract

Sexual satisfaction, adjustment to aging, and satisfaction with life are relevant dimensions of overall well-being across the life cycle. Through cluster analysis procedures, this study aims to describe the specific profile of adjustment to aging, sexual satisfaction and satisfaction with life of adults across the life span. This cross-sectional study involved a community-based sample of 619 Portuguese individuals, aged between 18 and 92 years old ($M=47.53$ $SD=18.34$) evaluated using a two-step cluster analysis. Four clusters emerged. The *most adjusted* participants were mostly of a younger age, women and had a high education. The *least adjusted* participants globally presented low education, poor perceived health, and poor engagement in leisure activities. *Well-being focused* participants were mostly women of older age, with high education and spirituality. Finally, *moderately satisfied* participants were mostly men of older age, had a lower education, and presented poor reported health. Complementary comparative analysis among the identified subgroups was performed. The *most adjusted* participants had the highest perceived overall sexual well-being, sexual attractiveness, sexual openness and communication, and sexual satisfaction. These data characterize the profile of this population and can be used as the basis for developing efficient strategies aimed at combining adjustment to aging, satisfaction with life and sexual satisfaction for tailored interventions to the specific needs of populations across the lifespan.

Keywords Adjustment to aging · Cluster analysis · Satisfaction with life · Sexual satisfaction · Sexual well-being

✉ Sofia von Humboldt
sofia.humboldt@gmail.com

¹ William James Center for Research, ISPA: Instituto Universitário de Ciências Psicológicas, Sociais e da Vida, Rua Jardim do Tabaco, 34, Lisbon 1149-041, Portugal

² Portucalense Institute of Psychology (I2P), Department of Psychology and Education, Portucalense University, Porto, Portugal

³ Faculty of Nursing, International Health Research, MacEwan University, Edmonton, AB, Canada

Introduction

Demographic changes due to longer average lifespans and lower birth rates are impacting all nations in different ways. The large increase in the older population rightly draws attention to aging as a social problem with a global impact (Donizzetti, 2019). Within such an international context, adjustment to aging (AtA) has been proposed as the flexible use of adaptive strategies to optimize personal functioning and well-being within the constraints of personal competence and resources (von Humboldt & Leal, 2017). How a person adjusts and adapts to aging is influenced by individual, biological, psychological, and social factors within the economic and political context in which they live, as well as lifestyle, educational, and environmental factors (von Humboldt & Leal, 2017). AtA is a different construct from quality of life and encompasses a dynamic interaction between autonomy, control, self-acceptance, personal growth, positive social network, and purpose in life (von Humboldt et al., 2013a; Humboldt et al., 2013c, 2022a). Quality of life, on the other hand, is a broader concept that encompasses overall well-being, including physical health, psychological state, social relationships, level of independence, and personal beliefs. While AtA focuses specifically on the process of adapting to age-related changes, quality of life considers a wider range of factors that contribute to a person's overall satisfaction with life and well-being (van Leeuwen et al., 2019). Health-related variables may subtly or otherwise affect adjustment in old age and allow older adults to maintain a sense of control, especially when facing late-life challenges (von Humboldt et al., 2021a).

Personal and environmental variables have an impact on how people age. Keeping a lively, active mind and staying socially integrated are particularly difficult for older adults (Berger, 2014; von Humboldt et al., 2022b; Humboldt et al., 2023a). Although a limited number of studies analyzing AtA among older adults were found, the literature reflected a growing and widespread interest in understanding what AtA means to adults (von Humboldt & Leal, 2017).

Indeed, the older population is also rapidly expanding. Developing the most adjusted healthcare for an aging population first requires a comprehensive understanding of how people think about old age (Escourrou et al., 2022). In this context, the Lifespan Developmental Theory, articulated by Baltes (1987), emphasized that development is a lifelong process, starting from childhood and continuing through old age. According to Baltes, development occurs across the entire lifespan, from birth to death, with significant psychological changes, challenges and growth happening, at every stage of life. This lifespan perspective highlights that development is not only lifelong but it is also multidimensional, as it encompasses biological, cognitive, and socioemotional processes; it is multidirectional, with varying trajectories of growth and decline; it is malleable, as it indicates potential for change throughout life; it is contextual, as it is influenced by historical, cultural, and social factors; and last, it is multidisciplinary, since it requires insights from various fields to fully understand human development (Baltes, 1987).

Satisfaction with life (SwL) is a cognitive evaluation of one's own life as a whole. Importantly, SwL judgements are based on one's own subjective criteria, rather than necessarily reflecting outward conditions. SwL can be inferred not only from direct

statements, but also from statements regarding coveting others' lives, regrets about the past, and a yearning to relive one's own life. To the extent that SwL is an important construct worth measuring, it should involve both the positive affirmation that one is satisfied or content with one's life, as well as an absence of serious regret, desire to change, and envy of others' lives (Margolis et al., 2019). SwL and happiness showed a positive curvilinear relationship with age (An et al., 2020). In older persons, sexual satisfaction was a reliable indicator of overall SwL (Skałacka & Gerymski, 2019). Moreover, sexual health and general well-being depend particularly on being sexually satisfied. Many older people still engage in sexual activity, and many of them are happy with their level of sexual activity (Buczak-Stec et al., 2023).

Sexuality is a complex concept having to do with partnerships, behaviors, attitudes, identity, orientation, beliefs, and activity (World Health Organization [WHO], 2020). More specifically, sexual activity can encompass a plethora of acts including penetrative sex (vaginal, anal), oral sex, and mutual masturbation. Importantly, a frequent and trouble-free sex life is associated with several physical and mental health benefits and sexual activity can be an important activity for maintaining physical health and emotional well-being (Jacob et al., 2020).

Sexual well-being pertains to sexual interest, functioning, and satisfaction within personal and relational contexts that provide opportunities for desired levels of intimacy and expression (Syme et al., 2013). Studies have begun to recognize sexual well-being as a lifelong consideration (DeLamater, 2012; Thompson et al., 2011). Ties between sexual attitudes and sexual well-being have been studied mostly among adolescents and pre-marital young adults, but increasingly, sexual attitudes are being explored in older age groups (Waite et al., 2009).

Sexual health and sexual satisfaction are important aspects of quality of life for many adults, including people in poor health (Flynn et al., 2016). Engaging in sexual activity with a partner increases well-being, but only when these motives are based on positive consequences (e.g., happiness of the partner or promoting the intimacy of the relationship), as opposed to avoiding negative ones (Gómez-López et al., 2019).

Sexual experiences play an important role in individuals' relational well-being (Leavitt et al., 2019). However, sexual activity frequency has consistently been shown to decline with age, while sexual interest and sexual satisfaction also decline, but not as sharply (Schick et al., 2010; Thompson et al., 2011).

Prior studies show a decline in sexual activity with age, but these studies often fail to consider the role of sexual satisfaction. A considerable proportion of midlife and older women remain sexually active if they have a partner available. Psychosocial factors (e.g., relationship satisfaction, communication with a romantic partner, and the importance of sex) matter more to sexual satisfaction than aging among midlife and older women (Thomas et al., 2015). Being mindful is important to the sexual and relational well-being, and self-esteem of middle-aged men and women as it teaches them how to approach sexual experiences with greater awareness and less judgement (see Leavitt et al., 2019).

Beyond simply living longer, it is becoming more and more vital to age with greater and better health (von Humboldt & Leal, 2013; von Humboldt et al., 2021b). Sexual well-being, which is mostly unstudied in the older population, contributes to health and well-being in later life (von Humboldt et al., 2023b). Older adults seem-

ingly adjust to aging and to probable health difficulties by engaging in an enjoyable activity rather than its frequency (Skalacka & Gerymski, 2019; von Humboldt et al., 2013c; Humboldt et al., 2023a).

The correlates and consequences of a satisfying sex life are important areas of research that are gaining increasing attention in the psychological and medical literature. While it has long been assumed that sexual activity affects the overall quality of life for men, few studies have begun to report similar findings for women (Stephenson & Meston, 2015). Sexual happiness and satisfaction, and the effects of sexual well-being on physical and emotional well-being, have been given comparatively little attention (Shifren et al., 2008). Moreover, older adults who are independent seem to have a higher satisfaction in life and most easily adjust to age-related changes (Zainab & Naz, 2017).

Severe mental disorders can interfere with sexual function and satisfaction, while patients wish to preserve a previously satisfactory sexual activity. In many patients, a lack of intimate relationships and chronic deterioration in mental and physical health can be accompanied by either a poor sexual life or a more frequent risky sexual behavior than in the general population (Montejo et al., 2018).

Adequate sexual expression can improve overall well-being, restore confidence and dignity, and allow patients with psychosis to overcome problems such as social disengagement and stigma. In a study comparing sexual life in patients with psychosis and healthy controls, sexual activity improved self-esteem and feelings of acceptance, as well as sleep, anxiety and mood similarly for both groups (Montejo et al., 2014). Sexual relationships were considered highly relevant by most patients, who were more concerned about affection and companionship than physical pleasure (Montejo et al., 2018).

Sexual health is fundamental to the overall health and well-being of individuals, couples and families, and to the social and economic development of communities and countries. Sexual health, when viewed affirmatively, requires a positive and respectful approach to sexuality and sexual relationships, as well as the possibility of having pleasurable and safe sexual experiences, free of coercion, discrimination and violence (WHO, 2022).

People are naturally inclined to desire to grow old with good health, own independence, and good living conditions (Mari et al., 2016). To age is to be human. Understanding how individuals adapt to age-related changes is essential to promoting healthy aging.

Currently, there is a notable absence of cluster studies that comprehensively compare AtA, SwL, and sexual satisfaction across various age groups throughout the life cycle. Such studies would provide valuable insights into how specific groups perform optimally in these domains. Investigating the interplay between them could shed light on the impact of age on overall well-being and inform strategies for improving quality of life across different age cohorts.

The present study uses cluster analysis to identify distinct subgroups of individuals across the life course, based on their level of AtA, sexual satisfaction and SwL, and with further clarity from sociodemographic and lifestyle factors. Additionally, this study identifies patterns of sexual well-being in all such empirically derived groups of individuals.

Methods

Participants

The 619 Portuguese people taking part in this study were between 18 and 92 ($M=47.53.20$; $SD=18.34$) years of age. Table 1 lists other sociodemographic characteristics.

The following were study eligibility criteria: (a) at least 18 years old, (b) clearly understanding their decision to participate; and (c) no history of cognitive limitations, psychiatric or neurological disorders, drug or alcohol abuse, or other similar issues. They must also have a basic understanding of how to use new technologies (such as smartphones, tablets, computers, apps, etc.).

Participants were taken to meet these eligibility requirements, both in terms of decision-making and cognitive abilities because the questionnaire was completed voluntarily and independently online. In addition, 88.2% of participants perceived themselves to be in good health. Only 13% of participants said that they had recently experienced a psychological issue that was mostly anxiety- and/or depression-related.

Material

Adjustment to Aging Scale (ATAS)

An evaluation of AtA in older individuals might be supplemented by the Adjustment to Aging Scale (AtAS). The Adjustment to Aging Scale (AtAS) comprised five different subscales, and the internal reliability of the scale and its five subscales proved to be strong: sense of purpose and ambitions (0.874); zest and spirituality (0.927); body and health (0.904); aging in place and stability (0.862); and social support (0.932).

Table 1 Sociodemographic characteristics of the participants

Characteristics	Frequency (<i>n</i>)	Percentage (%)
Total (overall)	619	100
Sex-at-birth		
Male	260	42.0
Female	359	58.0
Age group		
18–44 years	251	40.5
45–64 years	218	35.2
65+ years	150	24.2
Educational level		
< Secondary	175	28.3
Secondary	223	36.0
> Secondary	221	35.7
Marital status		
Single	182	29.4
Married/ <i>de facto</i> union	333	53.8
Divorced/separated	63	10.2
Widow	617	6.6

Possible responses span a seven-point Likert scale, with 1 denoting *Not at all important* and 7 denoting *Very Important*. This measure is a beneficial cross-cultural tool for research, clinical usage, and the development of health programs because it was validated and demonstrated good psychometric qualities in different samples (von Humboldt & Leal, 2017; von Humboldt et al., 2013a; Humboldt et al., 2013b, c). Internal consistency reliabilities were $\alpha=0.891$ for the AtAS as a whole, and ranged from $\alpha=0.862$ (body and health) to $\alpha=0.932$ (social support) across the five subscales (von Humboldt et al., 2014; von Humboldt & Leal, 2017). In the present study, excellent internal consistency was also obtained: 0.97 for the entire scale; 0.92, 0.85, 0.91, 0.89, and 0.88 for the five subscales mentioned above, respectively.

New Sexual Satisfaction Scale (NISS-S)

The NISS-S is a 12-item scale with a two-dimensional factor structure that is split into two subscales: the Self-Centeredness subscale, and the Partner-Centeredness and Sexual Activity subscale (Brouillard et al., 2019; Štulhofer et al., 2010). The NISS-S consists of an ordinal scale ranging from 1 (not at all satisfied) to 5 (very satisfied). Adding items within dimensions yields dimension-specific scores; adding all 12 items generates a total NISS-S score. The NISS-S is a valid and reliable scale. In this study, its internal consistency reliability was $\alpha=0.94$. In the present study, Cronbach's alphas of 0.96 and 0.95 were obtained for self-centered and partner-centered sexual satisfaction, respectively.

Satisfaction with Life (SwL)

The Satisfaction with Life Scale (SWLS; Diener et al., 1985) was used to measure SwL. This five-item unidimensional scale affords a cognitive evaluation of one's life as a whole (e.g., "I am satisfied with life.") (Pavot & Diener, 2008). Each item is rated along a 7-point Likert scale (1=strong disagreement and 7=strong agreement). In this study, the internal consistency reliability of the SwL was $\alpha=0.78$. In the present study, the internal consistency reliability of scale was $\alpha=0.89$.

Sociodemographic, Health and Lifestyle Questionnaire

For descriptive and cluster analysis purposes, participants were also asked about their age, education, health, nationality, and living circumstances (e.g., family household; marital status, professional status, hobbies).

Procedure

Data Collection Procedure

Each participant was given the study materials and asked to complete an informed consent form. Individuals were contacted through unofficial social networks. It was made clear to all potential participants that they could withdraw at any time. Their participation was completely voluntary. Data confidentiality and anonymity were guaranteed. Participants answered a Google Forms online survey and were assisted over the phone or by email, at their convenience. Data was collected from October 1 to December 30, 2021. The [Institutional name] Research Ethics Committee and [Institutional name] approved all such study procedures. The Portuguese Psychologists' Code of Ethics and the Helsinki Declaration on ethical standards for human subject research were adhered to. No financial incentives were offered for survey completion.

Data Analysis Procedure

All analyses were performed using IBM SPSS Statistics Version 27. Cluster analysis was employed to classify 619 study participants into unique clusters based on their AtA scores (sense of purpose and ambitions, zest and spirituality, body and health, aging in place and stability, social support), sexual satisfaction (ego-centered and partner/sexual activity centered), and SwL. Hierarchical cluster analysis was employed using the Ward method or the squared Euclidean distance to measure dissimilarity between subjects. Numbers of clusters to retain were identified using the R^2 statistic. A non-hierarchical *k-Means* procedure permitted further cluster refinements. *F* statistics generated in clusters. Analysis of variance [ANOVA] helped us to identify the most important variables in all four clusters. Chi-square analyses were then employed to examine sociodemographic and lifestyle differences between individuals in each of the four clusters. To further validate the four clusters and using ANOVA-based Tukey HSD tests, we were able to discern statistically significant between-cluster differences in scores across the two NISS-S subscales.

Results

According to the R^2 criterion, four clusters were retained, which explains 62.6% ($R^2=0.626$) of the total variance. Table 2 presents the centers of the clusters and the *F* statistic for each variable. The dimensions that most differentiate the clusters are AtA dimensions, and namely “body and health” ($F=687.081$), followed by “zest and spirituality” ($F=552.125$), “sense of purpose and ambitions” ($F=530.622$), “aging in place and stability” ($F=497.242$) and “social support” ($F=495.143$). Ego-centered ($F=244.197$) and partner/sexual activity centered ($F=222.715$) sexual satisfaction also differentiated clusters. The SwL ($F=28.423$) was the dimension least differentiating the four clusters.

Table 2 Clusters centers, frequencies, and F statistics for each variable

	Most adjusted (<i>n</i> =364)	Least adjusted (<i>n</i> =53)	Wellbeing focused (<i>n</i> =111)	Moderate- ly satisfied (<i>n</i> =90)	F (3, 614)
1. Sense of purpose and ambitions	6.477	2.788	6.243	4.714	530.622***
2. Zest and spirituality	6.282	2.691	6.240	4.887	552.125***
3. Body and health	6.522	2.698	6.397	5.003	687.081***
4. Aging in place and stability	6.331	2.723	6.490	5.275	497.242***
5. Social support	6.664	2.660	6.339	4.981	495.143***
6. Ego-centered sexual satisfaction	4.306	2.645	2.349	3.069	244.197***
7. Partner/sexual activity centered sexual satisfaction	4.197	2.609	2.311	2.893	222.715***
8. Satisfaction with life	3.865	2.879	3.659	3.315	28.423***

*** $p < .001$

Distinct groups of participants ($n=364$; 58.9%) were those having relatively high levels of AtA, sexual satisfaction and SwL (*Most adjusted*) versus low levels of AtA, sexual satisfaction and SwL (*Least adjusted*; $n=53$; 8.6%). In Cluster 3, there were 111 (18.0%) participants with high levels of AtA, low levels of sexual satisfaction and moderate levels of SwL (*Well-being focused*). The fourth cluster of participants ($n=90$; 14.6%) had moderate levels of AtA, sexual satisfaction and SwL (*Moderately satisfied*).

ANOVA results illustrate cluster differences in participants' age [$F_{(3, 614)} = 34.39$, $p < .001$, partial $\eta^2 = 0.144$]. Tukey post-hoc tests revealed that 'most adjusted' participants are significantly younger ($M=41.82$; $SD=16.75$) when compared to 'least adjusted' ($M=53.45$; $SD=17.75$), 'well-being focused' ($M=56.99$; $SD=16.46$) and 'moderately satisfied' ($M=55.79$; $SD=18.15$) participants.

Additionally, chi-square analyses showed differences between individuals in each of the four clusters according to sociodemographic and lifestyle characteristics (Table 3). There were significant differences by biological sex between the four clusters ($\chi^2(3, 616) = 7.87$, $p = .049$, $V = 0.113$), with more women than men being *most adjusted* and *wellbeing focused*. Level of education also mattered ($\chi^2(6, 616) = 60.47$, $p < .001$, $V = 0.221$). Participants with lower educational levels tended to present with low to moderate levels of AtA, sexual satisfaction and SwL (*least adjusted* and *moderately satisfied*). Those with higher levels of education were mainly 'most adjusted' and *wellbeing focused*. Clusters also significantly differed based on marital [$\chi^2(6, 616) = 80.52$, $p < .001$, $V = 0.192$] and professional [$\chi^2(3, 616) = 72.63$, $p < .001$, $V = 0.344$] status. For example, among *most adjusted* individuals, only 7.1% and 1.4% were respectively divorced/separated or widowed, and 90% were working. Being a spiritual person [$\chi^2(3, 616) = 9.26$, $p = .026$, $V = 0.122$] seems to grant participants a high AtA, despite their low sexual satisfaction and moderate SwL (*wellbeing focused*). Poorer perceived health was more typical [$\chi^2(3, 616) = 36.85$, $p < .001$, $V = 0.244$] of 'least adjusted' and 'moderately satisfied' individuals. Having a good love life [$\chi^2(3, 616) = 15.63$, $p = .001$, $V = 0.159$] also seemed to characterize the *most adjusted* participants. Not having leisure activity was a more salient characteristic of *least adjusted* individuals [$\chi^2(3, 616) = 17.86$, $p = .001$, $V = 0.171$].

Table 3 Four cluster solution according to sociodemographic and lifestyle characteristics

	N	Most adjusted n=364 %	Least adjusted n=53 %	Wellbeing focused n=111 %	Moderately satisfied n=90 %	χ^2	df	sig.	Cramer's V
Biological sex									
Female	359	59.6	52.6	64.9	46.7	7.87	3	0.049	0.113
Male	259	40.4	47.2	35.1	53.3				0.221
Educational level									
< Secondary	175	17.3	47.2	39.6	47.8	60.47	6	<0.001	
Secondary	222	42.3	35.8	23.4	25.6				
> Secondary	221	40.4	17.0	36.9	26.7				
Marital status									
Single	181	36.8	22.6	18.2	16.9	68.45	9	<0.001	0.192
Married/ <i>de facto</i> union	331	54.7	43.4	54.5	55.1				
Divorced/separated	63	7.1	13.2	15.5	14.6				
Widow	41	1.4	20.8	11.8	13.5				
Retired									
Yes	133	10.0	30.2	39.6	41.1	72.63	3	<0.001	0.344
No	482	90.0	69.8	60.4	58.9				
Spiritual person									
Yes	391	63.1	64.2	73.0	52.2	9.26	3	0.026	0.122
No	226	36.9	35.8	27.0	47.8				
Perceived general health									
Good	545	94.8	75.5	80.9	78.9	36.85	3	<0.001	0.244
Poor	72	5.2	24.5	19.1	21.1				
Love experience in life									
Good	516	88.5	75.5	75.5	78.9	15.63	3	0.001	0.159
Bad	101	11.5	24.5	24.5	21.1				
Leisure activity									
Yes	312	58.4	37.7	40.9	43.7	17.83	3	<0.001	0.171
No	296	41.6	62.3	59.1	56.3				

As shown in Table 4, clusters remarkably differed on perceived overall sexual well-being [$F_{(451,3)}=50.097, p<.001$; partial $\eta^2=0.250$], sexual attractiveness [$F_{(586,3)}=69.249, p<.001$; partial $\eta^2=0.262$], sexual openness and communication [$F_{(591,3)}=56.491, p<.001$; partial $\eta^2=0.223$] and sexual satisfaction [$F_{(587,3)}=99.306, p<.001$; partial $\eta^2=0.337$]. Findings from the Tukey HSD Test indicated that the *most adjusted* participants presented statistically significant higher scores in sexual well-being ($M=5.57$), sexual attractiveness ($M=5.33$), sexual openness and communication ($M=5.88$) and sexual satisfaction ($M=5.74$) when compared to participants who are *least adjusted*, *wellbeing focused* and *moderately satisfied*. Also, *least adjusted*, *wellbeing focused* and *moderately satisfied* participants do not differ in their levels of sexual attractiveness and sexual openness and communication. However, *least adjusted* participants present statistically significant higher scores in sexual well-being ($M=4.43$) and sexual satisfaction ($M=4.13$) when compared to well-being focused participants.

Discussion

The purpose of the present study was to identify a typology of individuals based on their level of AtA, sexual satisfaction and SwL, sociodemographic and lifestyle factors, and how these differentiate in terms of sexual well-being. The four distinct subgroups emerging from cluster analyses speak to the heterogeneity of experiences among individuals, and the need to adopt diverse and targeted strategies to promote well-being and aging well. Our findings support Baltes' Lifespan Developmental Theory (1987), which posits that development is a continuous process occurring across the entire lifespan. The observed variations in sexuality, AtA, and satisfaction with life, at different ages underscore the multidimensional, malleable and multidirectional nature of development.

The *most adjusted* participants in the first cluster cohesively endorsed positive aspects of AtA, such as purpose, zest for life, spirituality, health, and social support. They also generally enjoy contentment in various life aspects and report higher levels of sexual well-being and overall SwL. Indeed, the literature indicates that younger adult romantic relationships significantly impact well-being and SwL, with emotional, cognitive, and behavioral skill development (Gómez-López et al., 2019). Participants in this cluster are mostly young (18–44 years old), women, who have a high level of education and are in good health. Previous research indicates that individuals with high levels of SwL tend to have higher education, good physical and mental health, and are younger. *Most adjusted* participants were also mostly married and had good love experiences throughout life. Sharing intimacy with a partner and being cherished by family is an important factor associated with AtA and SwL. Social connectivity and support are resources for well-being and for aging well. The results of this study highlight the malleability of human development, demonstrating that individuals can adapt and change throughout their lives. This aligns with Baltes' notion (1987) that development is not fixed but flexible, allowing for growth and adaptation in response to life's challenges and opportunities.

Table 4 Four cluster groups according to sexual well-being items: descriptive and univariate tests

	Cluster	M	SD	F	p	df	η^2
How do you classify your sexual well-being?	Most adjusted	5.57 <i>a</i>	1.21	50.097	<0.001	3	0.250
	Least adjusted	4.43 <i>b</i>	2.28				
	Wellbeing focused	3.53 <i>c</i>	1.64				
	Moderately satisfied	4.08 <i>b, c</i>	1.39				
How do you classify your sexual attractiveness?	Most adjusted	5.33 <i>a</i>	1.23	69.249	<0.001	3	0.262
	Least adjusted	3.83 <i>b</i>	2.33				
	Wellbeing focused	3.30 <i>b</i>	1.64				
	Moderately satisfied	3.64 <i>b</i>	1.75				
How do you classify your sexual openness and communication?	Most adjusted	5.88 <i>a</i>	1.29	56.491	<0.001	3	0.223
	Least adjusted	4.15 <i>b</i>	2.41				
	Wellbeing focused	4.04 <i>b</i>	1.96				
	Moderately satisfied	4.11 <i>b</i>	2.01				
How do you classify your sexual satisfaction?	Most adjusted	5.74 <i>a</i>	1.17	99.306	<0.001	3	0.337
	Least adjusted	4.13 <i>b</i>	2.45				
	Wellbeing focused	3.20 <i>c</i>	1.67				
	Moderately satisfied	3.85 <i>b, d</i>	1.84				

Note: Measures marked with different letters (*a, b, c, d*) differ statistically, at the level of $\alpha < 0.05$, according to the Tukey HSD test. Cluster groups sharing the same letter (*a, b, c, d*) do not differ statistically

The *least adjusted* cluster of individuals struggled in various domains, displaying lower engagement in AtA, sexual satisfaction, and overall SwL. Research reveals that low levels of AtA are related to low satisfaction of life and sexual satisfaction (Smith et al., 2019; von Humboldt & Leal, 2017). Participants in this cluster had a lower level of education and poorer perceived general health, putting them at a high-risk for low SwL and difficulties in adjusting to aging. While adults may prioritize social activities over intimate interactions (Skalacka & Gerymski, 2019), this did not seem to be the case for *least adjusted* individuals who were also least engaged in leisure activities. Leisure activities help maintain mental and physical health, and cognitive functioning, all of which contribute to successful aging function. *Least adjusted* individuals were thus seemingly at a higher risk of presenting low levels of AtA and low SwL.

Well-being focused participants had high scores in AtA and SwL, but very low scores in sexual satisfaction. Participants in this cluster prioritize health, independence, and dignity, perhaps striving to evade physical limitations. They also find fulfillment in valued activities, nurturing relationships, optimism, peace, and spirituality, and thus seek balance and fulfillment in many aspects of life. The sexual well-being of *well-being focused* individuals remains a concern, however. Sexual satisfaction is often a challenge for older adults (Smith et al., 2019; von Humboldt & Leal, 2017; von Humboldt et al., 2023b). *Well-being focused* individuals are also older and mostly married women. In the literature, key demographic determinants of sexual satisfaction include age, education, financial standing, and having children. Although research has reported high sexual activity and satisfaction at advanced ages, older people do not always experience sexual satisfaction. While a higher level of sexual satisfaction has been shown to be related to better SwL, *well-being focused*

participants seem to derive SwL from other social and psychological factors like spiritual experiences. Spirituality can enhance well-being and SwL at any age. Our study's findings emphasize the importance of contextual influences on development, as proposed by Baltes (1987). The diverse experiences of participants across different age groups also reflect the impact of historical, cultural, and social contexts on their adjustment to aging and satisfaction with life.

The *Moderately satisfied* cluster represents individuals with moderate satisfaction levels in AtA and their lives as a whole, while their sexual well-being is in a balanced range, without extreme highs and lows. SwL is positively related to sexual satisfaction among adults who engage in sexual activity (Smith et al., 2019). However, worries about one's sexual life and issues related to sexual functioning may closely contribute to reduced levels of life enjoyment (Smith et al., 2019; von Humboldt et al., 2023b). Participants in this cluster are mostly married men aged 65 years old and above. Although the literature has generally shown that men are more sexually active than women at all ages, sexual dissatisfaction appears to be more common among men versus women in later life. Consistent with the Lifespan Developmental Theory (1987), our results illustrate the multidimensionality of human development. Biological, cognitive, and socioemotional factors shape patterns of sexuality and satisfaction with life and speak to human development across the lifespan as complex.

Results also show that the *most adjusted* participants had the highest scores for sexual well-being, attractiveness, openness and communication, and satisfaction. These participants generally enjoy positive and fulfilling sexual experiences. They report feeling sexually well, attractive, openly discussing sexual needs, and experiencing high sexual satisfaction. In fact, young adults demonstrate a keen interest in taking a more active role in managing their sexual health, actively searching for responses to their individual questions, which intensifies with maturity. Interestingly this cluster did not have the highest score for sexual satisfaction. Literature highlights the positive relationship between sexuality and SwL across the life cycle (Gómez-López et al., 2019; Callens et al., 2021; von Humboldt et al., 2023b).

In contrast, *least adjusted* participants presented lower scores across all aspects of sexual well-being. Their sexual openness/communication and satisfaction scores are notably higher than their attractiveness score. This suggests that while they may feel less attractive, their ability to communicate about sex is relatively strong. Research highlights factors influencing sexual satisfaction across the life cycle, emphasizing the importance of positive communication and a supportive partner's significance, for aging well (von Humboldt et al., 2023b).

Well-being focused participants also display relatively low scores across all aspects of sexual well-being. Although their attractiveness, openness/communication, and satisfaction scores are higher than *moderately satisfied* participants, they remain notably lower overall. These results point to older adults' challenges with their sexual lives, with this potentially leading to reduced life enjoyment (Smith et al., 2019). Older adults may encounter challenges in managing their sexual health concerns due to misconceptions about age-related declines in sexual interest (Træen et al., 2019).

Moderately satisfied participants show higher sexual well-being scores compared to their *well-being focused* counterparts, but to a lesser degree than *most adjusted* and

least adjusted. Their openness/communication scores surpass their sexual satisfaction and sexual attractiveness scores. This suggests moderate sexual well-being, and positive openness and communication, despite potential attractiveness and satisfaction challenges. A recent systematic review tells of people in their 60s or their 80s shifting their perspective on sexuality, viewing it as more than sexual intercourse (Bell et al., 2017). Sexual expressions are demonstrations of care, affection and companionship; physical attractiveness or desire are less important (Langer, 2009; Træen et al., 2019). The findings also corroborate Baltes' concept (1987) of multidirectional development, where objective dimensions, such as satisfaction with life may improve with age, while others may decline or remain stable. This nuanced understanding of the process of aging highlights the importance of considering multiple developmental trajectories.

This study shows some limitations, which must be considered when interpreting the results. One limitation is the potential for selection bias. The recruitment of adults who are willing to take part in research about any aspect of sex is challenging. Therefore, the sample may not have fully represented the diversity of adults in terms of their cultural background, socioeconomic status, or health status, which could limit the external validity or generalizability of the results.

Our reliance on self-report measures is another limitation, which may introduce bias and measurement error into the data. Individuals may choose not to accurately report their sexual behavior or satisfaction. Additionally, social desirability bias may have influenced the responses, as participants may have either minimized or exaggerated their answers or refused to disclose negative experiences or behaviors related to sexuality.

Another limitation of the study design is the potential for confounding variables to affect the observed relationships between sexual satisfaction, AtA, and SwL. Cross-sectional data does not permit causal inferences. There are likely unmeasured variables or contextual factors influencing cluster membership and cluster associations with dependent variables. For example, the quality of interpersonal relationships, religious beliefs, or access to healthcare may all affect how sexual satisfaction and SwL are perceived. In addition, the study may be limited by the quality and validity of the measurement tools used to assess sexual satisfaction, AtA, and SwL. Existing measures may not fully capture the experiences of adjusting to aging and sexual well-being, or they may not be sensitive enough to detect meaningful changes over time.

Notwithstanding the implications of this study are significant in terms of informing interventions and policies aimed at improving aging well. Understanding the relationship between sexual satisfaction, AtA, and SwL is essential for designing interventions that address the needs of the population. For example, promoting sexual health and providing education and resources for sexual functioning may help to enhance overall SwL in older adults. Additionally, interventions aimed at promoting positive attitudes towards aging and promoting resilience in the face of age-related changes may improve AtA and, in turn, improve overall well-being.

Another implication of this study is the need to challenge ageist stereotypes and attitudes toward sexuality, especially in older adults. Many individuals hold negative views about sexuality in old age, perceiving it as inappropriate or unimportant. This stigma can prevent older adults from seeking help and support for sexual health con-

cerns and may contribute to social isolation and loneliness. Understanding the relationship between sexual satisfaction and SwL in older adults can help to challenge these stereotypes and promote more positive attitudes towards sexuality in old age. By acknowledging and valuing the sexual experiences and desires of older adults, we can create a more inclusive and supportive society for all individuals, regardless of age (WHO, 2022).

The findings of this study may also have implications for clinical practice, as healthcare providers working with older adults should be aware of the potential impact of sexual satisfaction on overall health and well-being. Addressing sexual health concerns sensitively and appropriately may help to improve the quality of life and prevent negative health outcomes (Mitchell, Lewis, O'Sullivan & Fortenberry, 2021; WHO, 2022). Moreover, understanding the relationship between sexual satisfaction and SwL can help healthcare providers to identify individuals who may be at risk of depression or other mental health issues, and to provide appropriate support and treatment.

Finally, another important implication of this study is the need to recognize the diversity of experiences and needs. Adults and older adults are a heterogeneous population with varying cultural backgrounds, socioeconomic status, and health status. The implications of our study extend to the broader framework of lifelong development as proposed by Baltes (1987). By recognizing that significant developmental changes occur at every stage of life, we can better understand and support the ongoing processes of adjustment and satisfaction throughout the adult lifespan. This study highlights the importance of understanding how sexual satisfaction, AtA, and SwL are experienced and valued by different groups of older adults.

In conclusion, results revealed four distinct clusters. The *most adjusted* encompasses a cohesive integration of positive aspects of AtA, higher levels of sexual well-being and overall SwL. *Least adjusted* participants face struggles in various domains, displaying lower engagement in both AtA and sexual well-being. *Well-being focused* emphasizes overall SwL and well-being and detrimental sexual satisfaction. Finally, *moderately satisfied* participants show moderate satisfaction levels in AtA and overall life, while maintaining moderate levels of sexual well-being. By recognizing and addressing these differences, we can develop interventions and policies that are tailored to the specific needs and preferences of different populations. This can help to improve the effectiveness of interventions and reduce health disparities among (older) adults. Understanding these differences across the life cycle can also inform the development of more culturally sensitive and inclusive healthcare services that promote aging well for all.

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Data Availability This manuscript has associated data in a data repository.

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.

Competing Interests The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the paper.

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