

# Sexual Conservatism and Sexual Satisfaction in Older Women: A Cross-Sectional Mediation Analysis

Priscila A. Vasconcelos, Catarina Ramos, Constança Paúl & Pedro J. Nobre

To cite this article: Priscila A. Vasconcelos, Catarina Ramos, Constança Paúl & Pedro J. Nobre (2021) Sexual Conservatism and Sexual Satisfaction in Older Women: A Cross-Sectional Mediation Analysis, *Clinical Gerontologist*, 44:3, 249-258, DOI: [10.1080/07317115.2021.1872755](https://doi.org/10.1080/07317115.2021.1872755)

To link to this article: <https://doi.org/10.1080/07317115.2021.1872755>



Published online: 22 Jan 2021.



Submit your article to this journal [↗](#)



Article views: 212



View related articles [↗](#)



View Crossmark data [↗](#)



Citing articles: 1 View citing articles [↗](#)



## Sexual Conservatism and Sexual Satisfaction in Older Women: A Cross-Sectional Mediation Analysis

Priscila A. Vasconcelos MSc<sup>a</sup>, Catarina Ramos MSc<sup>a</sup>, Constança Paúl PhD<sup>b</sup>, and Pedro J. Nobre PhD <sup>a</sup>

<sup>a</sup>Faculty of Psychology and Education Sciences, Center for Psychology at University of Porto, Porto, Portugal; <sup>b</sup>ICBAS, University of Porto, Porto, Portugal

### ABSTRACT

**Objectives:** The present study aims to assess the relationship between age and sexual satisfaction in older women and testing the potential mediating role of conservative sexual beliefs on this association.

**Methods:** A total of 106 women ( $M_{\text{age}} = 68.71$ ;  $SD = 6.31$ ) completed measures of sexual beliefs (SDBQ), sexual functioning (FSFI), and sexual satisfaction (GMSEX). Bivariate correlation analyses were performed to assess the association between age, sexual conservatism, sexual satisfaction, and sexual function. Mediation analysis with bootstrap samples was performed to test the mediating effect of sexual conservatism.

**Results:** Findings suggest a mediating effect of conservative sexual beliefs on the relationship between age and sexual satisfaction in a community-based sample of older women ( $F(3,102) = 9.31$ ,  $p < .001$ ,  $R^2 = .215$ ).

**Conclusions:** The negative association between sexual conservatism and sexual satisfaction of the participants, and the non-significance of the direct effect of age in sexual satisfaction when including sexual conservatism in the mediation model, highlight the relevance of cognitive factors in sexual health in later life.

**Clinical Implications:** Results such as the mediating role of sexual conservatism on the relationship between age and sexual satisfaction provide opportunities for developing and testing sexual health programs based on the demystification of sexual beliefs.

### KEYWORDS

Older age; conservative sexual beliefs; sexual satisfaction

### Introduction

The global population continues to grow in unprecedented manner, with older population with 65 years old or above outnumbering younger subjects (United Nations, 2019), as a result of increased life expectancy and low birth rates (Kowal, Goodkind, & He, 2016). Simultaneously, sexual health rights recognize the positive effects of healthy sexual experiences on personal fulfillment and well-being throughout the lifespan (WAS, 2008; WHO, 2015). In fact, the aging process may benefit from maintaining sexual experiences in older age (Kirkman, Fox, & Dickson-Swift, 2016): recent studies have shown that maintaining sexual interest in older age is associated with higher successful aging across four European countries (Stulhofer, Hinchliff, Jurin, Hald, & Traeen, 2018). Even though studies tend to report an increasing likelihood to develop sexual difficulties as age progresses (Lewis et al., 2004; Peixoto & Nobre, 2015), studies

also suggest that older women are increasingly tending to be sexually active as age progresses (Traeen et al., 2019b). Physical changes inherent to the process of aging may contribute to prejudices in sexual function (Fisher et al., 2010). However, physical changes and age itself are not the sole determinants of sexuality in older age. Sexuality in later life is rather a product of biological, psychological, and sociocultural determinants (DeLamater & Karraker, 2009), which indicates a greater variability in sexual expression (Hillman, 2012).

### Sexual beliefs

Several studies have suggested that sexual beliefs are determining factors of sexual function and satisfaction. In particular, sexual beliefs are often regarded as predisposing and maintaining factors of sexual dysfunction in both men and women (Nobre & Pinto-Gouveia, 2006; Nobre, Pinto-

Gouveia, & Allen Gomes, 2003), being an intervention target in treating sexual difficulties (Brotto et al., 2016). According to the cognitive-emotional model of sexual dysfunction developed by Nobre and colleagues (Nobre, 2009, 2010), men and women who present more sexual beliefs (e.g., “a real man has sexual intercourse very often” or “after menopause women lose their sexual desire”) are more likely to activate negative self-schemas when an unsuccessful sexual event takes place, which in turn, along with trait factors such as neuroticism, increases their vulnerability to developing sexual dysfunctions.

Sexual conservatism can be defined as a set of beliefs “characterized by the idea that coitus is the central aspect of human sexuality, considering masturbation, oral and anal sex deviant and sinful activities” (Nobre et al., 2003, p. 178). The authors also suggest that sexual conservatism includes considering female’s sexual role as being passive, implying virginity as an important value for non-married women. Results from studies addressing the role of sexual beliefs or attitudes toward sex tend to point out that older adults have more traditional and conservative sexual attitudes (Le Gall, Mullet, & Shafiqhi, 2002; Nobre et al., 2003; Waite, Laumann, Das, & Schumm, 2009).

Regarding the role of sexual attitudes, positive attitudes toward sex emerge as significant predictors of sexual behavior (Fischer, Træen, & Hald, 2018; Træen, Carvalheira, Hald, Lange, & Kvaem, 2019a) and sexual desire (DeLamater & Sill, 2005) in older population. More specifically, positive attitudes regarding the importance of sex for well-being and positive attitudes toward aging and sexual changes are linked with lower changes in sexual interest and with higher frequency of partnered and individual sexual activities (Træen et al., 2019a). Furthermore, by using an experimental design, Carvalho, Ferreira, Rico, and Santos (2017) demonstrated that sexual conservatism, rather than age, emerged as predictor of negative appraisal of sexually explicit pictures.

### **Sexual satisfaction**

Lawrance and Byers (1995, p. 268) define sexual satisfaction as “an affective response arising from one’s subjective evaluation of the positive and negative dimensions associated with one’s sexual

relationship”. Many studies link increasing age with decreased sexual satisfaction (Chao et al., 2011; Field et al., 2013; Træen & Schaller, 2010). However, given the large methodological variability, many studies have failed to relate increasing age with lower levels of sexual satisfaction. Another issue that arises when assessing sexual satisfaction in older age is that measures often define sexual satisfaction in terms of sexual frequency, excluding physical and emotional satisfaction with one’s sexual life (Træen et al., 2017).

More recent studies indicate that age itself may not be the most relevant predictor of sexual satisfaction of older adults, with relationship status emerging as a more relevant factor than age itself (DeLamater & Sill, 2005; Field et al., 2013; Freak-Poli, 2020; Gott, 2005; Traeen et al., 2019b). Recently, Freak-Poli (2020) showed that lack of partner availability emerged as the greatest barrier to being sexually active in older age, and not age per se. Regarding sociodemographic correlates of sexual satisfaction, Traeen et al. (2019b) demonstrated that having a partner emerged as the main predictor of older adults’ sexual satisfaction from four European countries. This is consistent with the assumption that sexuality in older age entails more than physiological determinants (DeLamater & Karraker, 2009; DeLamater & Sill, 2005).

A consistent finding among studies that address the correlates of sexual satisfaction in later life is that gender emerges as an important correlate of sexual satisfaction in older age, with older women presenting lower levels of sexual satisfaction than older men (Laumann et al., 2006; Thompson et al., 2011). Even though one of the reasons that may explain these findings is the higher likelihood of older women lacking an available partner (DeLamater & Sill, 2005), little is known about why older women are less sexually satisfied than older men.

Regarding the relationship between sexual beliefs and sexual satisfaction, Abdolmanafi, Nobre, Winter, Tilley, and Jahromi (2018) found that conservative sexual beliefs emerge as significant predictors of Iranian women’s sexual dissatisfaction. More specifically, ageist sexual attitudes contribute negatively to both older women’s and older men’s sexual well-being (Graf & Patrick, 2014).

Findings clarify that despite age and sexual beliefs being regarded as determining factors of

sexual experience – such as sexual function and sexual satisfaction – little is known about their role on older women's sexual experience, which highlights the importance of considering sexual beliefs when addressing sexuality in older age.

### Aims

As noted above, age and sexual beliefs seem to have a negative relation with sexual satisfaction. However, there is no empirical evidence about the mediating role of sexual beliefs on the association between age and older women's sexual satisfaction. Hence, this study aims to assess the relationship between age and sexual satisfaction and test the mediating role of conservative sexual beliefs.

Considering previous findings, our study proposes the following hypotheses: i) age will be positively correlated with sexual conservatism; ii) age will be negatively correlated with sexual satisfaction; iii) sexual conservatism will be negatively correlated with sexual satisfaction; iv) sexual conservatism will play a mediating role in the relationship between age and sexual satisfaction.

### Method

#### Participants and procedure

With the collaboration of RUTIS (Senior University Network Association), participants were recruited through a convenience sampling method upon contacting seven Universities of the Third Age. Universities of the Third Age (U3A's) or Senior Universities (SU) can be regarded as formal support networks that emerge as socio-educational responses aiming to create and promote regular social, cultural and educational activities, which can be provided by public or private entities. Contrary to the original French model for U3A (Lemieux, Boutin, & Riendeau, 2007), Portuguese Senior Universities adopted an English approach based in non-formal education (Pinto, 2003).

Upon receiving approval from the University Ethics Committee, participants were asked to complete a paper-and-pencil self-administered questionnaire assessing sociodemographic variables, sexual beliefs, female sexual function, and sexual satisfaction. After giving their informed consent,

participants completed an anonymous online questionnaire. No personal information that could lead to the identification of the participants was required (e.g. e-mail or IP addresses). Data collection was accomplished by paper-and-pencils self-administered protocols in group sessions. Inclusion criteria was defined by age and sex, with participants having to be female and at least 55 years old to engage in the current study. Relationship status and sexual orientation were not assumed to be exclusion criteria. However, all participants identified themselves as being exclusively heterosexual. There was no monetary compensation or other incentive to participate in the study. Data was collected between May and July 2018.

#### Measures

*Sociodemographic variables*, such as age, marital status, education level, occupation, duration of current relationship, sexual orientation, and religiosity were assessed to characterize the sample.

*Female Sexual Function* was measured through the Portuguese version of the Female Sexual Function Index (Rosen et al., 2000), which is a 19-item questionnaire that assesses six dimensions of female sexual functioning: sexual desire, subjective sexual arousal, lubrication, orgasm, sexual satisfaction, and sexual pain. In addition to specific indexes for each of these dimensions, a total index of sexual function can be calculated (minimum = 3; maximum = 36). The original version of the measure revealed adequate temporal stability (correlations between  $r = 0.79$  and  $r = 0.86$ ) and discriminant validity (Rosen et al., 2000). The Portuguese version also presented similar characteristics, revealing adequate psychometric qualities regarding internal consistency (Cronbach's  $\alpha$  values between .88 and .93). In the current study, this measure revealed adequate global internal consistency with Cronbach's  $\alpha$  of .92.

*Conservative Sexual Beliefs* were evaluated with the female version of the Sexual Dysfunctional Beliefs Questionnaire (SDBQ-F; Nobre et al., 2003). SDBQ is a 40-item questionnaire that assesses specific stereotypical sexual myths regarded in clinical literature as predisposing factors for the development of female sexual dysfunctions (Nobre, 2009; Nobre & Pinto-Gouveia, 2006).

The original version of the questionnaire presented adequate reliability and validity. SDBQ had adequate temporal stability, presenting statistically significant correlation for the total scale ( $r = .80$ ) between two consecutive administrations (Nobre et al., 2003). Higher scores in both the global index of SDBQ-F and in the domains (e.g. sexual conservatism) indicate that respondents present more stereotypical sexual beliefs. High internal consistency of the questionnaire was supported by Cronbach's  $\alpha$  of .81. In the current study, the questionnaire revealed adequate global internal consistency (Cronbach's  $\alpha = .93$  for the total scale). The domain of sexual conservatism (see Table 1) also showed adequate global internal consistency (Cronbach's  $\alpha = .90$ ).

The Portuguese version of the Global Measure of Sexual Satisfaction (GMSEX; Lawrance & Byers, 1995; Pascoal, Narciso, Pereira, & Ferreira, 2012) was used to assess *Sexual Satisfaction*. GMSEX assesses subjective appreciation of current partnered sexual relationship through 5 items that characterize the sexual relationship by using a 7-point *Likert* scale ranging from 7 to 1 (i.e. "good-bad", "pleasant-unpleasant", "positive-negative", "satisfying-unsatisfying", "valuable-worthless"). The original version of the scale supported the high internal consistency of the scale through Cronbach's  $\alpha$  of .96 (Lawrance & Byers, 1995). The Portuguese version of the scale maintained its psychometric properties, presenting temporal stability ( $r = .84$ ), and high internal consistency with Cronbach's  $\alpha$  of .98 (Pascoal et al., 2012). In the current study, the scale equally presented high internal consistency, presenting Cronbach's  $\alpha$  of .97.

### Data analysis

According to some authors, mediation analysis must be performed exclusively with longitudinal data for controlling temporal sequence between variables included in the model (Maxwell, Cole, & Mitchell, 2011; O'Laughlin, Martin, & Ferrer, 2018; Shrout, 2011). We recognize that causal relations may only be established with longitudinal data that assesses change over time. However, similarly to different forms of multiple regression analysis and

partial correlation, cross-sectional mediation analysis can be regarded as a type of variance partitioning that may be useful even in studies without multiple waves of data collection (Salthouse, 2011). According to Salthouse (2011, p. 797), "it is worth considering whether the problem is the analytical methods or the inferences about developmental phenomena based upon results of the methods"; hence, the non-rejection of cross-sectional mediation analysis as an informative method when considering its limitations. Implementing mediation analysis will allow to explore potential patterns of correlations between age, sexual conservatism, and sexual satisfaction.

A descriptive analysis was conducted regarding age, relationship status, educational level, and sexual functioning for characterizing the sample. Bivariate correlation analyses were performed to determine associations between age, sexual conservatism, sexual satisfaction, and sexual function. Kolmogorov-Smirnov test revealed problems with normality (all  $ps < .05$ ). Linearity and homoscedasticity assumptions were fulfilled. In order to alleviate problems with the assumptions required to carry out mediation analysis (normality assumption), the bootstrap method (5000 bootstrap samples) was applied through using PROCESS macro 3.5 for IBM-SPSS (Hayes, 2018). Conclusions on the indirect effect (i.e., the path from age to sexual satisfaction via sexual conservatism, controlling for the effect of sexual function) were based on the 95% Bias-Corrected Bootstrap Confidence Intervals (95% BCBCI) (Preacher & Hayes, 2008). The 95% BCBCI that did not include 0 were considered significant for the indirect effect of the predictor (X) on the dependent variable (Y) via a mediator (M). Effect size was assessed based on completely standardized indirect effect size ( $ab_{cs}$ ), which indicates that the predicted variable (Y) is expected to decrease by the magnitude of effect size standard deviations for every standard deviation increase in the predicting variable (X) indirectly via the mediator (M). Effect size was interpreted according to the criteria proposed by Preacher and Kelley (2011): small size effect (.01), medium size effect (.09), and large size effect (0.25). The proportion of total effect mediated ( $P_m$ ), which is defined as  $ab/c$  was also analyzed (Shrout & Bolger, 2002)

**Table 1.** Sexual conservatism items (female SDBQ).

|  |
|--|
| 1. Masturbation is wrong and sinful.                                 |
| 2. The best gift woman could bring to marriage is her virginity.     |
| 3. Masturbation is not a proper activity for respectable women.      |
| 4. Reaching climax/orgasm is acceptable for men but not for women.   |
| 5. Sexual activity must be initiated by a man.                       |
| 6. Orgasm is possible only by vaginal intercourse.                   |
| 7. Sexual intercourse during menstruation can cause health problems. |
| 8. Oral sex is one of the biggest perversions.                       |
| 9. Anal sex is a perverted activity.                                 |

## Results

### Participants

A total of 106 women with at least 55 years participated in the study ( $M_{\text{age}} = 68.71$ ;  $SD = 6.31$ ;  $\text{Min} = 56$ ;  $\text{Max} = 82$ ). Most of the participants were married or in common-law marriage (64.2%) and completed middle school (28.3%) or had a least one college degree (20.4%). Based on average values on the domains of the FSFI (Rosen et al., 2000), descriptive analysis regarding sexual function indicated that 63.5% of the participants had lower or absent sexual desire, with more than 75% having self-reported arousal difficulties. Eighty-five percent of the participants presented lubrication problems, thus consisting the most prevailing sexual complaint. Difficulties pertaining to orgasm were reported by more than 66% of the sample. Pain-related symptoms were the least reported sexual problems (48.9%).

### Age, sexual conservatism and sexual satisfaction

Means, standard deviation, and range of the responses to age, SDBQ-F (domain of sexual conservatism), GMSEX, and FSFI are presented in Table 2. Correlations between variables are shown in Table 3. Age, sexual conservatism, and sexual satisfaction present weak or moderate correlations with one another (Cohen, 1988). More specifically, older age is linked with higher sexual conservatism ( $p < .05$ ) and with lower levels of sexual satisfaction ( $p < .01$ ). Sexual conservatism and sexual

**Table 2.** Means, SD, and range of age, sexual beliefs, and sexual satisfaction.

| Variable            | Mean  | SD   | Range |
|---------------------|-------|------|-------|
| Age                 | 68.71 | 6.31 | 56–82 |
| Sexual conservatism | 20.35 | 7.75 | 9–45  |
| Sexual satisfaction | 20.97 | 5.83 | 5–35  |
| Sexual function     | 18.12 | 9.55 | 2–36  |

\*  $p < .05$ . \*\*  $p < .01$ .**Table 3.** Correlation matrix.

| Variable               | 1     | 2      | 3   | 4 |
|------------------------|-------|--------|-----|---|
| 1. Age                 | 1     |        |     |   |
| 2. Sexual conservatism | .24*  | 1      |     |   |
| 3. Sexual satisfaction | -.26* | -.44** | 1   |   |
| 4. Sexual function     | -.06  | -.21*  | .87 | 1 |

**Table 4.** Mediation role of sexual conservatism (n = 106).

| Predictors              | b     | t        | F       | df    | R <sup>2</sup> |
|-------------------------|-------|----------|---------|-------|----------------|
| Model 1                 |       |          |         |       |                |
| Age (X)                 | -.25  | -2.67**  | 3.97*   | 2,103 | .071           |
| Model 2                 |       |          |         |       |                |
| Sexual conservatism (M) | -.398 | -4.32*** |         |       |                |
| Age (X)                 | -.164 | -1.82    | 9.31*** | 3,102 | .215           |

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

satisfaction are negatively correlated ( $p < .01$ ). Female sexual function is exclusively correlated with sexual conservatism ( $p < .05$ ).

### Mediating role of sexual conservatism

Considering that sexual conservatism is significantly correlated with sexual function ( $r = -.21$ ,  $p < .05$ ), and that Hayes (2018) suggests managing confounding and epiphenomenal associations by statistically controlling their influence in the estimation of the other effects in the model, a mediation analysis was performed with age as the predicting variable (X), sexual satisfaction as the predicted variable (Y), sexual conservatism as the mediator (M) and sexual function as covariate. Results from the mediation analysis are shown in Table 4. The analysis indicated a negative significant total effect of age on sexual satisfaction ( $c = -.23$ , 95% BCBCI [-.409, -.060]). However, when including sexual conservatism as mediator on the association between age and sexual satisfaction, a non-significant direct effect of age was found ( $c' = -.15$ , 95% BCBCI [-.317, .014]) which demonstrates the mediation of the effect of age on sexual satisfaction by sexual conservatism ( $ab = -.083$ , 95% BCBCI [-.155, -.004]), with a medium size effect ( $ab_{\text{cs}} = -.090$ , 95% BCBCI [-.167, -.004]). Also, 36.1% of the effect of age on sexual satisfaction is mediated by sexual conservatism ( $P_{\text{m}} = .361$ ).

## Discussion

The present study aimed to analyze the associations between age, sexual conservatism, and sexual satisfaction in older women. Moreover, the main goal

was to explore the mediating role of sexual conservatism on the relationship between age and sexual satisfaction.

Our first hypothesis – age will be positively correlated with sexual conservatism – was confirmed. Results from bivariate correlation analysis indicated that increasing age is significantly related with higher sexual conservatism. As stated above, previous findings consistently demonstrated that older age is correlated with more traditional and conservative sexual attitudes (Le Gall et al., 2002; Waite et al., 2009).

Results suggest that our second hypothesis – age will be negatively correlated with sexual satisfaction – was also confirmed. Correlation analysis indicated a significant negative association between age and sexual satisfaction, with increasing age being linked with decreased sexual satisfaction. This result is consistent with earlier findings. Even though more recent studies demonstrate that increasing age does not imply changes in sexual satisfaction, earlier research is consensual in

establishing a negative association between older age and sexual satisfaction (Chao et al., 2011; Field et al., 2013; Træen & Schaller, 2010).

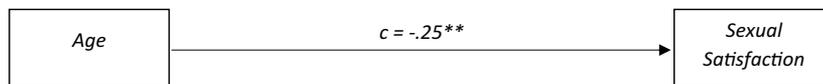
As expected, results from correlation analysis also indicate that our third hypothesis – sexual conservatism will be negatively correlated with sexual satisfaction – was confirmed. Abdolmanafi et al. (2018) found that women that reported more sexual conservative beliefs showed higher sexual dissatisfaction. Also, Graf and Patrick (2014) found that having more ageist sexual attitudes was linked with lower sexual well-being for both older men and women, which is consistent with our findings.

Finally, in order to test our fourth hypothesis – sexual conservatism plays a mediating role in the relationship between age and sexual satisfaction – we analyzed the direct effect of age on sexual satisfaction, and its effect via conservative sexual beliefs in older women. We found that sexual conservatism presented a mediating effect between age and sexual satisfaction (see Figure 1). Our data suggest that older women are more prone to present higher

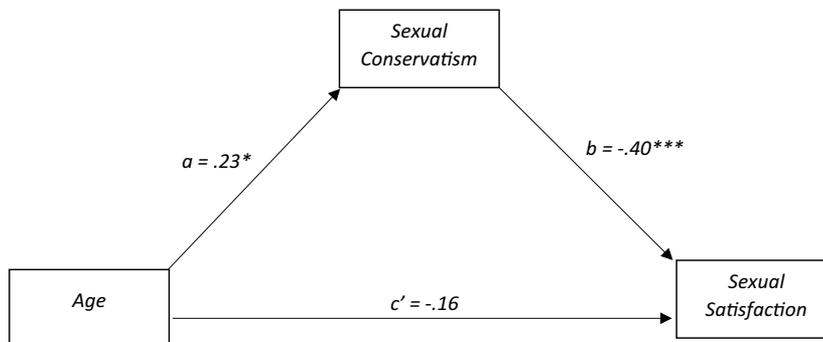
\*  $p < .05$

\*\*  $p < .01$

\*\*\*  $p < .001$



a) Direct Pathway



b) Indirect or Mediated Pathway

**Figure 1.** Graphical representation of the mediating role of sexual conservatism on the association between age and sexual satisfaction.

sexual conservatism, thus reporting lower sexual satisfaction. Overall, the inclusion of sexual conservatism as a mediating variable reduced the effect of age on older women's sexual satisfaction, which supports the idea that age itself is not the sole explanatory factor of sexual satisfaction of older women. Studies consensually indicate that older age is linked with more traditional and conservative sexual attitudes (Le Gall et al., 2002; Waite et al., 2009). Also, recent studies propose that relationship status, rather than age, emerges as a more relevant factor for sexual satisfaction (Traeen et al., 2018). Hence, results from the mediation analysis suggest that other factors must be considered when predicting sexual satisfaction of older women, such as interpersonal factors (e.g. availability of sexual partner) and person-related factors (e.g. sexual beliefs). In fact, the mediation model we proposed only explains 36.3% of sexual satisfaction in our sample, which is compatible with the idea that other explanatory factors should be addressed when explaining older women's sexual satisfaction.

These findings should however be regarded with caution, since the study has limitations that should be reflected upon. The convenience sampling method not only limits the heterogeneity of the sample but is also not representative of the Portuguese Population, since those women that agreed to participate although showing sexual conservatism, might be less conservative than older women with lower levels of education.

The non-assessment of cohort or generational effects is also a limitation of the current study. In particular, coming of age before or after the sexual revolution of the 1960s has implications on sexual attitudes (Fisher et al., 2010). Recently, Thorpe (2019) showed that despite women who were educated during the sexual revolution presented more liberal attitudes toward sexuality in later life, they also shared traditional heteronormative notions of sexual expression. This points out to the relevance of considering cohort as a potential moderator in the relationship between age and sexual conservatism and, consequently, with sexual satisfaction.

Even though this study assessed sexual satisfaction independently from sexual function, using a validated measure, the use of FSFI (Rosen et al., 2000) for measuring sexual function has limitations that should

be reflected upon. Despite being a widely used instrument for screening female sexual dysfunction, norms remain scarce for applying the FSFI in older age. By validating the FSFI to older francophone women, Dargis et al. (2012) recommended that sexual dysfunction in older age should be redefined by setting specific interpretation standards according to different age groups as occurs when using other measures of psychological functioning. Specifically, new standards should be defined when accounting the lowest scores from participants who reported having no sexual activity recently. Considering the frequency decrease of sexual activities with age, the authors propose extending the evaluation period to the last 6 months rather than the previous 4 weeks. Also, since measures of sexual function tend to reduce sexual activities to vaginal intercourse, a broader conceptualization of sexual function that includes non-genital activities – such as tenderness and caresses – should be considered (Dargis et al., 2012).

Another limitation that should be pointed out is that due to the cross-sectional nature of the study, causality cannot be established. Still, according to Salthouse (2011), cross-sectional mediation analysis may be informative when taken into account its limitations. In this sense, the current study has the strength of consisting, to the best of our knowledge, of the first study to test the mediating role of sexual conservatism on the association between age and sexual satisfaction in older women.

Despite these limitations, the current study may contribute as a starting point to future research aiming to test the mediating role of sexual conservatism, in particular, or sexual beliefs, as a whole, on the relationship between age and sexual health indicators (e.g. sexual function, sexual satisfaction, sexual well-being, and sexual pleasure) in older population. In fact, our results are consistent with those of previous research in respect to the negative relationship of age and sexual conservatism with sexual satisfaction in heterosexual older women. To the best of our knowledge, previous research had yet to test the mediating role of sexual conservatism on the relationship between age and sexual satisfaction. Also, using GMSEX to assess sexual satisfaction allowed to define sexual satisfaction according to the subjective evaluation of one's sexual life rather than define it in terms of the frequency of sexual activities, which lessens the

measurement bias against age when addressing sexual satisfaction.

Hence, one of our goals was to fill this gap in research in the field of aging and sexuality. By applying longitudinal designs, future research might contribute to determine causal associations between these factors in groups that vary in age, gender, sexual diversity, and that present different sexual difficulties.

### Clinical implications

- The negative association between sexual conservatism and sexual satisfaction of the participants highlights the relevance of cognitive factors in sexual health.
- Given the mediating role of sexual conservatism on the relationship between age and sexual satisfaction, these findings may contribute to a better understanding of the determinants of sexual satisfaction in older age.
- Results such as the non-significant direct effect of age on sexual satisfaction provide opportunities for and normalize sexual satisfaction in older age.
- Future clinical research can determine the benefits of including the demystification of conservative sexual beliefs in sex education programs that aim at promoting sexual satisfaction of older men and women.

### Disclosure statement

No potential conflict of interest was reported by the authors.

### ORCID

Pedro J. Nobre PhD  <http://orcid.org/0000-0003-2571-6972>

### References

- Abdolmanafi, A., Nobre, P., Winter, S., Tilley, P. J. M., & Jahromi, R. G. (2018). Culture and sexuality: Cognitive-emotional determinants of sexual dissatisfaction among iranian and new zealand women. *Journal of Sexual Medicine*, 15(5), 687–697. doi:10.1016/j.jsxm.2018.03.007
- Brotto, L., Atallah, S., Johnson-Agbakwu, C., Rosenbaum, T., Abdo, C., Byers, E. S., ... Wylie, K. (2016). Psychological and interpersonal dimensions of sexual function and dysfunction. *Journal of Sexual Medicine*, 13(4), 538–571. doi:10.1016/j.jsxm.2016.01.019
- Carvalho, J., Ferreira, L., Rico, R., & Santos, I. (2017). The effect of age and sexual beliefs in the cognitive and emotional appraisal of sex pictures in a sample of portuguese women. *Journal of Sexual Medicine*, 14(5), e255–e256. doi:10.1016/j.jsxm.2017.04.259
- Chao, J.-K., Lin, Y.-C., Ma, M.-C., Lai, C.-J., Ku, Y.-C., Kuo, W.-H., & Chao, I. C. (2011). Relationship among sexual desire, sexual satisfaction, and quality of life in middle-aged and older adults. *Journal of Sexual & Marital Therapy*, 37(5), 386–403. doi:10.1080/0092623X.2011.607051
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences*. Hillsdale, N.J.: L. Erlbaum Associates.
- Dargis, L. D., Trudel, G., Cadieux, J., Villeneuve, L., Préville, M., & Boyer, R. (2012). Validation of the female sexual function index (FSFI) and presentation of norms in older women. *Sexologies*, 21(3), 126–131. doi:10.1016/j.sexol.2012.01.002
- DeLamater, J., & Karraker, A. (2009). Sexual functioning in older adults. *Current Psychiatry Reports*, 11(1), 6–11. doi:10.1007/s11920-009-0002-4
- DeLamater, J. D., & Sill, M. (2005). Sexual desire in later life. *The Journal of Sex Research*, 42(2), 138–149. doi:10.1080/00224490509552267
- Field, N., Mercer, C. H., Sonnenberg, P., Tanton, C., Clifton, S., Mitchell, K. R., ... Johnson, A. M. (2013). Associations between health and sexual lifestyles in Britain: Findings from the third national survey of sexual attitudes and lifestyles (Natsal-3). *The Lancet*, 382(9907), 1830–1844. doi:10.1016/S0140-6736(13)62222-9
- Fischer, N., Træen, B., & Hald, G. M. (2018). Predicting partnered sexual activity among older adults in four European countries: The role of attitudes, health, and relationship factors. *Sexual and Relationship Therapy*, 1–19. doi:10.1080/14681994.2018.1468560
- Fisher, L., Anderson, G. O., Chapagain, M., Montenegro, X., Smoot, J., & Takalkar, A. (2010). *Sex, romance, and relationships: AARP survey of midlife and older adults*. Washington, DC. 10.26419/res.00063.001
- Freak-Poli, R. (2020). It's not age that prevents sexual activity later in life. *Australasian Journal on Ageing*, 39(1), 22–29. doi:10.1111/ajag.12774
- Gott, M. (2005). *Sexuality, sexual health and ageing*. Berkshire, England: Open University Press.
- Graf, A. S., & Patrick, J. H. (2014). The influence of sexual attitudes on mid-to late-life sexual well-being: Age, not gender, as a salient factor. *The International Journal of Aging and Human Development*, 79(1), 55–79. doi:10.2190/AG.79.1.c
- Hayes, A. F. (2018). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach* (2nd ed.). New York, NY, USA: Guilford Press.
- Hillman, J. (2012). *Sexuality and aging: Clinical perspectives*. Reading, PA, USA: Springer Science.
- Kirkman, L., Fox, C., & Dickson-Swift, V. (2016). A case for sexual health policy that includes midlife and older adult

- sexuality and sexual health. *Aging and Society*, 6. doi:10.18848/2160-1909/CGP/v06i02/17-27
- Kowal, P., Goodkind, D., & He, W. (2016). *An aging world: 2015*. International population reports. U.S. Government Printing Office. Retrieved from <http://www.census.gov/library/publications/2016/demo/P95-16-1.html>
- Laumann, E. O., Paik, A., Glasser, D. B., Kang, J.-H., Wang, T., Levinson, B., ... Gingell, C. (2006). A cross-national study of subjective sexual well-being among older women and men: Findings from the global study of sexual attitudes and behaviors. *Archives of Sexual Behavior*, 35(2), 145–161. doi:10.1007/s10508-005-9005-3
- Lawrance, K. A., & Byers, E. S. (1995). Sexual satisfaction in long-term heterosexual relationships: The interpersonal exchange model of sexual satisfaction. *Personal Relationships*, 2(4), 267–285. doi:10.1111/j.1475-6811.1995.tb00092.x
- Le Gall, A., Mullet, E., & Shafiqhi, S. R. (2002). Age, religious beliefs, and sexual attitudes. *The Journal of Sex Research*, 39(3), 207–216. doi:10.1080/00224490209552143
- Lemieux, A., Boutin, G., & Riendeau, J. (2007). Faculties of education in traditional universities and universities of the third age: A partnership model in gerontology. *Higher Education in Europe*, 32(23), 151–161. doi:10.1080/03797720701840666
- Lewis, R. W., Fugl-Meyer, K. S., Bosch, R., Fugl-Meyer, A. R., Laumann, E. O., Lizza, E., & Martin-Morales, A. (2004). Epidemiology/risk factors of sexual dysfunction. *J Sex Med*, 1(1), 35–39. doi:10.1111/j.1743-6109.2004.10106.x
- Maxwell, S. E., Cole, D. A., & Mitchell, M. A. (2011). Bias in cross-sectional analyses of longitudinal mediation: Partial and complete mediation under an autoregressive model. *Multivariate Behavioral Research*, 46(5), 816–841. doi:10.1080/00273171.2011.606716
- Nobre, P. J. (2009). Determinants of sexual desire problems in women: Testing a cognitive-emotional model. *Journal of Sexual & Marital Therapy*, 35(5), 360–377. doi:10.1080/00926230903065716
- Nobre, P. J. (2010). Psychological determinants of erectile dysfunction: Testing a cognitive-emotional model. *Journal of Sexual Medicine*, 7(4 Pt 1), 1429–1437. doi:10.1111/j.1743-6109.2009.01656.x
- Nobre, P. J., & Pinto-Gouveia, J. (2006). Dysfunctional sexual beliefs as vulnerability factors to sexual dysfunction. *The Journal of Sex Research*, 43(1), 68–75. doi:10.1080/00224490609552300
- Nobre, P. J., Pinto-Gouveia, J., & Allen Gomes, F. (2003). Sexual dysfunctional beliefs questionnaire: An instrument to assess sexual dysfunctional beliefs as vulnerability factors to sexual problems. *Sexual and Relationship Therapy*, 18(2), 171–204. doi:10.1080/1468199031000061281
- O'Laughlin, K. D., Martin, M. J., & Ferrer, E. (2018). Cross-sectional analysis of longitudinal mediation processes. *Multivariate Behavioral Research*, 53(3), 375–402. doi:10.1080/00273171.2018.1454822
- Pascoal, P., Narciso, I., Pereira, N., & Ferreira, A. (2012). Validation process of the global measure of sexual satisfaction in three samples of the portuguese population. *Psicologia: Reflexao E Critica*, 26, 691–700.
- Peixoto, M. M., & Nobre, P. (2015). Prevalence and socio-demographic predictors of sexual problems in Portugal: A population-based study with women aged 18 to 79 years. *Journal of Sexual & Marital Therapy*, 41(2), 169–180. doi:10.1080/0092623x.2013.842195
- Pinto, M. (2003). As universidades da terceira idade em Portugal: Das origens aos novos desafios no futuro [Universities of the third age in Portugal: From its origins to new challenges in the future]. *Revista Da Faculdade De Letras - Linguas E Literaturas*, 20(2), 467–478.
- Preacher, K., & Kelley, K. (2011). Effect size measures for mediation models: Quantitative strategies for communicating indirect effects. *Psychological Methods*, 16(2), 93–115. doi:10.1037/a0022658
- Preacher, K. J., & Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior Research Methods*, 40(3), 879–891. doi:10.3758/BRM.40.3.879
- Rosen, R., Brown, C., Heiman, J., Leiblum, S., Meston, C., Shabsigh, R., ... D'Agostino, R., Jr. (2000). The female sexual function index (FSFI): A multidimensional self-report instrument for the assessment of female sexual function. *Journal of Sexual & Marital Therapy*, 26(2), 191–208. doi:10.1080/009262300278597
- Salthouse, T. A. (2011). All data collection and analysis methods have limitations: Reply to Rabbitt (2011) and Raz and Lindenberger (2011). *Psychological Bulletin*, 137(5), 796–799. doi:10.1037/a0024843
- Shrout, P., & Bolger, N. (2002). Mediation in experimental and nonexperimental studies: New procedures and recommendations. *Psychological Methods*, 7(4), 422–445. doi:10.1037/1082-989X.7.4.422
- Shrout, P. E. (2011). Commentary: Mediation analysis, causal process, and cross-sectional data. *Multivariate Behavioral Research*, 46(5), 852–860. doi:10.1080/00273171.2011.606718
- Stulhofer, A., Hinchliff, S., Jurin, T., Hald, G. M., & Traeen, B. (2018). Successful aging and changes in sexual interest and enjoyment among older European men and women. *Journal of Sexual Medicine*, 15(10), 1393–1402. doi:10.1016/j.jsxm.2018.08.011
- Thompson, W. K., Charo, L., Vahia, I. V., Depp, C., Allison, M., & Jeste, D. V. (2011). Association between higher levels of sexual function, activity, and satisfaction and self-rated successful aging in older postmenopausal women. *Journal of the American Geriatrics Society*, 59(8), 1503–1508. doi:10.1111/j.1532-5415.2011.03495.x

- Thorpe, R. (2019). Tensions and contradictions: Women's stories of ageing and sexuality in the context of the past. *Sexualities*, 22(5–6), 969–986. doi:10.1177/1363460718779968
- Træen, B., Carvalheira, A., Hald, G. M., Lange, T., & Kvalem, I. L. J. S.; Culture. (2019a). Attitudes towards sexuality in older men and women across europe: Similarities, differences, and associations with their sex lives. *Sexuality & Culture*, 23(1), 1–25.
- Træen, B., Enzlin, P., Kvalem, I. L., Stulhofer, A., Janssen, E., Graham, C. A., ... Enzlin, P. (2017). Sexuality in older adults (65+) - an overview of the literature, part 2: Body image and sexual satisfaction. *International Journal of Sexual Health*, 29(1), 1–10. doi:10.1080/19317611.2016.1227012
- Træen, B., & Schaller, S. (2010). Subjective sexual well-being in a web sample of heterosexual norwegians. *International Journal of Sexual Health*, 22(3), 180–194. doi:10.1080/19317611003776087
- Træen, B., Stulhofer, A., Janssen, E., Carvalheira, A., Hald, G. M., Lange, T., & Graham, C. (2019b). Sexual activity and sexual satisfaction among older adults in four european countries. *Archives of Sexual Behavior*, 48(3), 815–829. doi:10.1007/s10508-018-1256-x
- United Nations, Department of Economic and Social Affairs, Population Division. (2019). World population prospects: highlights (Report No. ST/ESA/SER.A/423). New York, NY: United Nations.
- Waite, L. J., Laumann, E. O., Das, A., & Schumm, L. P. (2009). Sexuality: Measures of partnerships, practices, attitudes, and problems in the national social life, health, and aging study. *The Journals of Gerontology. Series B, Psychological Sciences and Social Sciences*, 64(Suppl 1), i56–i66. doi:10.1093/geronb/gbp038
- World Association for Sexua Health (WAS). (2008). *Declaration of sexual rights*. Retrieved from <http://www.worldsexology.org/resources/declaration-of-sexual-rights/>
- World Health Organization (WHO). (2015). *Sexual health, human rights and the law* (Author ed.). Geneva, Switzerland.