ANDROPAUSE REPRESENTATIONS: A MIXED-METHODS STUDY WITH PORTUGUESE WOMEN

REPRESENTAÇÕES DA ANDROPAUSA: UM ESTUDO DE MÉTODOS MISTOS COM MULHERES PORTUGUESAS

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ABSTRACT: Since psychosocial factors have some impact on andropause, and this phenomenon can affect conjugal relationships (and women tend to be health information seekers) it becomes important to study the representations of andropause using the Common-Sense Model – a model used to understand the representations of menopause. This research aimed to assess Portuguese women's representations of andropause, the suitability of the Common-Sense Model in explaining those representations, and to explore differences among participants with different characteristics (e.g., level of education), regarding andropause representations. Interviews to 30 women were analysed (directed qualitative content analysis). A multiple correspondence analysis explored the association between the emergent categories. Mann-Whitney U tests were performed to test differences regarding the frequency of emergent categories. Undefined identity was the most frequently mentioned feature regarding andropause *Identity*, whereas Sexual Function was the most mentioned *Negative Consequence*; few *Positive Consequences* were mentioned, being the Absence of positives consequences and the Lack of information the most frequent ones. Two bidimensional models were found - one for *Identity* of andropause: (1) Aging related changes, and (2) Sexual changes/lack of information; the other for *Negative Consequences*: (1) Symptoms/health problems, and (2) Depression/lack of information. No differences were found in the frequency of andropause representations between women with different characteristics (e.g., with a romantic relationship vs. without a romantic relationship). The suitability of the Common-Sense Model to explain these women's andropause representations did not differ among participants with distinctive characteristics. This research may help healthcare professionals to develop comprehensive interventions (based on this theoretical model) in order to help couples to better understand and cope with andropause.

Keywords: Andropause; Mixed-methods; Representations; Women; Common-sense model

RESUMO: Uma vez que os fatores psicossociais têm algum impacto sobre a andropausa, e esse fenómeno pode afetar as relações conjugais (e as mulheres tendem a procurar informação sobre saúde), torna-se importante estudar as representações da andropausa empregando o Modelo de Senso

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Comum – um modelo usado para entender as representações de menopausa. Este estudo teve como objetivo avaliar as representações de mulheres portuguesas sobre a andropausa, a adequação do modelo de senso comum para explicar essas representações e explorar as diferenças entre participantes com diferentes características (e.g., nível de escolaridade), em relação às representações da andropausa. Trinta mulheres foram entrevistas e posteriormente as entrevistas foram analisadas através da análise de conteúdo qualitativa dirigida. Uma análise de correspondência múltipla explorou a associação entre as categorias emergentes. Os testes U de Mann-Whitney foram realizados para testar as diferenças em relação à frequência das categorias emergentes. A Identidade indefinida foi a característica mais citada em relação à *Identidade*, enquanto que a Função Sexual foi a *Consequência Negativa* mais mencionada; poucas *Consequências Positivas* foram mencionadas, sendo a Ausência de consequências positivas e a Falta de informação as mais frequentes. Foram encontrados dois modelos bidimensionais – um para a *Identidade* da Andropausa: (1) Mudanças relacionadas com o envelhecimento e (2) Mudanças sexuais/Falta de informação; a outra para *Consequências Negativas*: (1) Sintomas/Problemas de saúde e (2) Depressão/Falta de informação. Não foram encontradas diferenças na frequência das representações da andropausa entre mulheres com características diferentes (e.g., com um relacionamento romântico vs. sem um relacionamento romântico). A adequação do Modelo de Senso Comum para explicar as representações da andropausa dessas mulheres não diferiu entre os participantes com características distintas. Esta investigação pode ajudar os profissionais de saúde a desenvolverem intervenções mais compreensivas (com base neste modelo teórico), a fim de ajudar os casais a compreender e lidar melhor com a andropausa.
Palavras-Chave: Andropausa; Métodos mistos; Representações; Mulheres; Modelo de senso comum

As life expectancy and focus on the quality-of-life increases, it also becomes increasingly important to study phenomena and features linked to the aging process—andropause included (Anderson et al., 2002; Lee et al., 2009; Yan, 2010). Andropause, also known as age-related hypogonadism (Anderson et al., 2002) or late-onset hypogonadism (Saad & Gooren, 2014; Wu et al., 2010), refers to the serum testosterone decline that might onset along with similar complaints and symptoms to those experienced by women during menopausal transition (Melby, 2006; Yan, 2010). This serum testosterone decline is gradual, typically around 1-2% per year after the age of 40 to 50 (Saad & Gooren, 2014), therefore making andropause a slower (Novák et al., 2002; Pines, 2011; Tan & Philip, 1999; Yan, 2010), less known and more unnoticeable process (Anderson et al., 2002; Melby, 2006; Samipoor et al., 2017; Tan & Philip, 1999; Yan, 2010) than menopause and, consequently, a less studied one (Pines, 2011).

Indeed, it seems difficult to correlate serum testosterone decline with specific symptoms (Novák et al., 2002), that in last instance may only reflect age-related and metabolic changes (Melby, 2006; Saad & Gooren, 2014; Yan, 2010) or medical conditions and disorders (Adebajo et al., 2007; Novák et al., 2002; Wu et al., 2010). According to the European Male Ageing Study (EMAS), some symptoms that seem significantly associated with low testosterone levels are decreased frequency in morning erection, low sexual desire, erectile dysfunction, inability to engage in vigorous activity (e.g., running), loss of energy, depression, and fatigue. In a syndromic perspective, the clustering of the three sexual symptoms mentioned with low testosterone levels appears to be more consistent (Wu et al., 2010). However, to our knowledge, the EMAS represent the largest study to date focusing aging in European men, and there is still a global lack of information in literature regarding andropause and men's general and sexual health comparatively to women's (Corona et al., 2010; Harrison, 2011; Lee et al., 2009). Specifically, the few studies that explore the existent awareness of andropause suggest little knowledge among men (Adebajo et al., 2007; Tan & Philip, 1999; Yan, 2010) and health care professionals (Adebajo et al., 2007; Harrison, 2011); even when general public and health professionals demonstrate some knowledge on the issue, misconceptions are still revealed (Anderson

et al., 2002). A recent study had also suggested that when men experience symptoms of andropause they still might not acknowledge that experience as andropause (Samipoor et al., 2017). Consequently, it is not surprising that some men in andropause might be unidentified or misidentified (Adebajo et al., 2007; Novák et al., 2002).

Nevertheless, the testosterone decline calls for clinical attention, since there are studies recognizing that physical and emotional changes associated with it might impact men's health (Lee et al., 2009; Novák et al., 2002; Saad & Gooren, 2014; Samipoor et al., 2017) and quality of life (Lee et al., 2009; Novák et al., 2002). Additionally, this phenomenon seems to be influenced by psychosocial factors. Aiming to address sexual health needs of aging couples, a recent study introduces the paradigm of "*couplepause*", highlighting that menopause and andropause might be processes occurring concurrently and interdependently—with both affecting the subject's sexual health and the sexual health of the subject's partner, and consequently the couple's sexual satisfaction and intimacy (Jannini & Nappi, 2018). Inclusive, erectile dysfunction had already been pointed out as a potentially shared sexual concern of couples (Fisher et al., 2009a, 2009b), and associations between women's and men's perceptions, beliefs and attitudes towards erectile dysfunction and its treatment had been emphasized (Fisher et al., 2009a, 2009b). It is suggested that men would more likely seek treatment if their female partner, for example, believed in erectile dysfunction as permanent and moderate to severe, held a positive view on treating erectile dysfunction, or had higher sexual satisfaction before erectile dysfunction had emerged (Fisher et al., 2009b). In fact, women's views on andropause might be particularly important, since men and women seem to behave differently in information-seeking, with women tending to adopt a mediator role on their families—looking for health information both regarding themselves and others within the family (Harrison, 2011). This might be because women, contrarily to men, are more used to medical care and medical procedures throughout life, firstly going to the doctor to contraceptives' prescription during adolescence, then being accompanied regarding pregnancy, and then regarding menopause (Gooren, 2000). Consequently, it might be hypostatized that in some cases women will adopt an active role in men's coping with andropause.

The Common-Sense Model (Leventhal et al., 1998) – also recognized in the literature as Self-Regulation Model - has been suggested to understand the menopausal experience among women since it accounts for cognitive representations of menopause, and for how women cope with related symptoms (Chou & Schneider, 2012; Hunter & O'Dea, 2001). Thus, Leventhal et al. (2016) emphasize the several dimensions of the model namely: 1) identity which focus the attributed label and symptoms of the menopausal experience, 2) perceived consequences which account for perceived severity of menopause and its impact (including negative and positive consequences), 3) cause, which entails the source (i.e., hormone changes) of menopause, 4) control, that is the perceived self-management of menopause, and 5) time frame which regards to the perceived short or long duration of menopause. However, the suitability of this to an analogous process such as andropause has not yet been studied.

Considering that psychosocial factors have some impact on andropause, potentially affecting both men's health and conjugal relationships, and since women may be particularly active in health information seeking, the present study aims 1) to assess Portuguese women's representations of andropause, 2) to explore the suitability of the Leventhal et al. (2016) model explaining women's andropause representations, and 3) to explore potential associations between women's sociodemographic characteristics and pertinent emergent categories regarding andropause representations.

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METHODS

Participants

The present study was based on an intentional non-probabilistic sample of 30 Portuguese heterosexual women with ages ranging from 40 to 86 years old ($M = 52.97$, $SD = 10.17$). Table 1 summarizes the main characteristics of the sample.

Table 1. Participant's sociodemographic, health, lifestyle and menopause-related variables.

Characteristic	Participants	
	n	*%*
Menopause status		
Pre-menopause	9	30.00
Peri-menopause	2	6.67
Post-menopause	19	63.33
Type of menopause		
Natural	11	57.90
Surgical	7	36.84
Undefined	1	5.26
Level of education		
< 9th grade	3	10.00
9th grade – 12th grade	12	40.00
Higher education	15	50.00
Professional status		
Active	21	70.00
Inactive	7	23.33
Current romantic relationship		
No	7	23.33
Yes	23	76.67
Current sexual life		
Non-active	8	26.67
Active	22	73.33
Parity		
No	3	10.00
Yes	27	90.00
Diseases/relevant clinical episodes		
No	17	56.67
Yes	13	43.33
Current hormonal problems[a]		
No	21	70.00
Yes	9	30.00
Psychological problem/mental disease		
No	24	80.00
Yes	6	20.00
Regular exercise/physical activity		
No	13	43.33
Yes	17	56.67
Body mass index (kg/m^2)		
Adequate weight (18.5 to 24.9)	13	43.33
Overweight/Obesity ($\geq$ 25)	17	56.67

Nota: [a] related to thyroid, suprarenal, pituitary, or other.

Material

A protocol of several questionnaires to assess participant's sociodemographic (e.g., age, level of education), health (e.g., diseases and relevant clinical episodes), lifestyle (e.g., physical exercise) and menopause-related (e.g., menopausal status and type of menopause) characterization was prepared by the authors of this research. To determine menopausal status, Harlow et al. (2012) criteria was followed and women were defined as pre-menopausal (i.e., absence of modifications in the menstrual cycle), peri-menopausal (having variable menstrual cycle length and/or amenorrhea periods superior to 60 days) or post-menopausal (an amenorrhea period equal or superior to 12 months).

A semi-structured interview was also performed. This regarded andropause representations ("What is andropause for you?"), perceived positive consequences of andropause ("Does andropause have any positive consequences? If so, which ones?"), and perceived negative consequences of andropause ("Does andropause have any negative consequences? If so, which ones?"), based on the conclusions of Hunter and O'Dea (2001) regarding the menopausal experience.

Procedure

The Health Committee of William James Center for Research, ISPA – Instituto Universitário approved the study. This study is part of a research project named "Experiências de Vida | Saúde na Adultícia" [Life Experiences | Health in Adulthood] (EVISA). The first stage of this study included women aged above 40 years and above, and multiple socio-demographic, health, lifestyle and menopause-related variables were assessed. At the end of this stage, participants were invited to leave their contact details if they would be available to be interviewed in a second stage regarding menopause and andropause representations. A total of 30 out of 59 women who had left their contact details proceeded to this second stage of this study (see Figure 1). Interviews were conducted by phone call, with the participants' consent and the authorization for audio recording and subsequent treatment of the data, at the beginning of the contact. Confidentiality was assured along with the possibility for withdrawal at any moment without any consequences. The privacy and suitability of the room where the interview was conducted were assured. Anonymity was secured by attributing alpha-numeric codes to participants and their transcribed interviews. This research followed the standards of the Portuguese Psychologists Association (2011) and the American Psychological Association (2003) regarding the ethical treatment of participants and ethical validation of the project was given by the Translational Group Coordination of the William James Center for Research.

Interviews were transcribed in a verbal and non-verbal content (e.g., pauses and laughter) using the Directed Approach, qualitative content analysis (Hsieh & Shannon, 2005). This approach also known as a deductive use of theory (Potter & Levine-Donnerstein, 1999) or as a deductive category application (Mayring, 2000), allows the identification of both units of the interviews and the frequency of each category regarding an initial coding scheme being developed and operationalized according to existing theory and prior research; this coding scheme may then be refined throughout the analysis.

Accordingly, the coding procedure followed was: (a) identification of mutually exclusive emerging categories regarding the latent content of each of the three pre-existing categories (Andropause Identity, Andropause Positive Consequences, and Andropause Negative Consequences); (b) conception of customized codes; (c) analysis and identification of speech excerpts which met the emerging categories; and (d) evaluation of coding decisions made by comparing speech excerpts with categories' theoretical definitions and with other speech excerpts within the existing categories—in some cases either extending the scope of certain categories or re-allocating some speech excerpts in more theoretical suitable categories. MAXQDA software (v. 2012) was used to code the interviews'

content, and this was made in a dependent way by two evaluators (psychologists) of 28 interviews. To assess inter-rater reliability (Cohen's kappa coefficient, κ), the last two transcribed interviews were coded in an independent way by two evaluators. However, as the reliability assessment indicated a fair agreement ($\kappa = .28$, $p = .014$), final codification of these interviews was afterwards achieved by consensus.

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│           336 women             │
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│     1st phase of the EVISA       │
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│ Sociodemographic, health,       │
│ lifestyle and menopause-related │
│ questionnaire                    │
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│ 59 women left their contact to   │        │ During contact:                   │
│ the 2nd phase of the EVISA       │──────▶ │ 10 changed their mind             │
└─────────────────────────────────┘        │ 7 with phone contact disconnected │
                │                           │ 6 did not answered the call       │
                ▼                           │ 3 with phone turned off repeatedly│
┌─────────────────────────────────┐        │ 3 excluded due to background noise│
│     2nd phase of the EVISA       │        │ during interview recording        │
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│ Semi-structured interview on     │        │           30 women               │
│ andropause representations       │        └──────────────────────────────────┘
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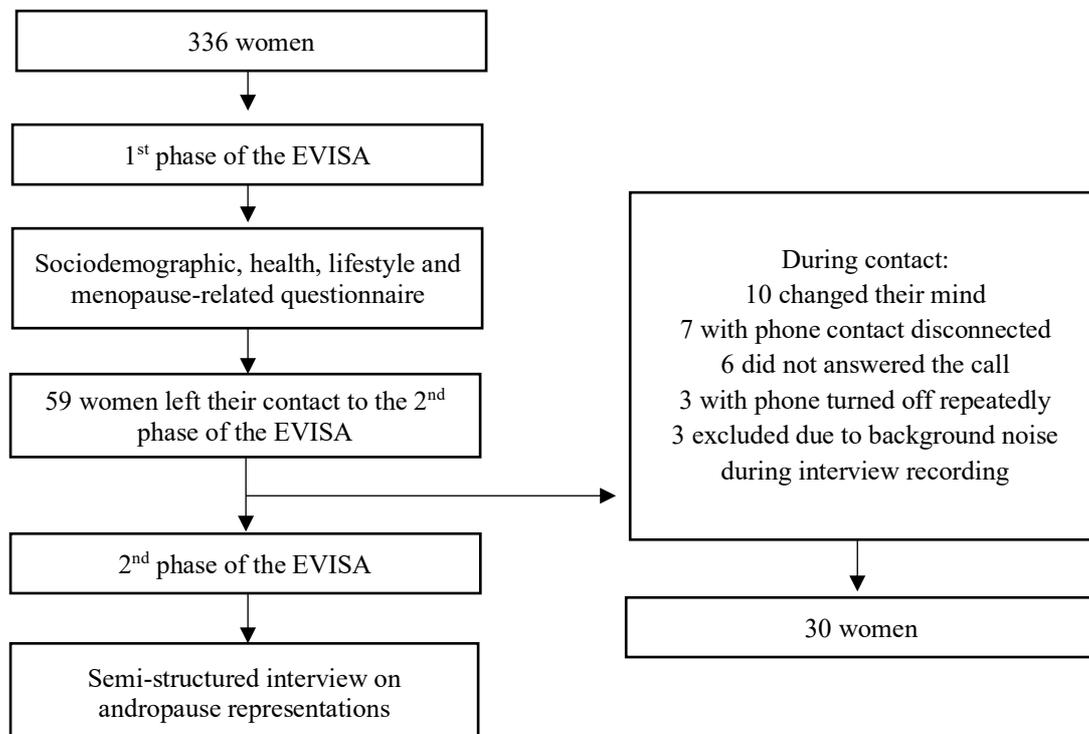
Figure 1. Participant process through the study.

Multiple correspondence analysis (MCA) was also performed to explore associations between the emergent categories derived from the Directed Qualitative Content Analysis and to acknowledge potential clusters regarding women's conceptualization of andropause. It was established as a criterion to only consider emergent categories that were mentioned by at least three participants (10% of the sample).

Finally, Mann-Whitney U tests were performed to test differences regarding the frequency of emergent categories, between groups of presence-absence of specific sociodemographic variables among our sample. Descriptive analysis, Cohen's kappa coefficient, MCA and Mann-Whitney U tests were done using SPSS software (v. 25, IBM Corp. Armonk, NY).

RESULTS

Regarding andropause's Identity dimension [having Leventhal et al. (2016) model as standard], the qualitative content analysis of the interviews revealed that an *Undefined identity* stood out the most, with the majority of women of this sample reporting a lack of information on andropause characterization. Another Identity category frequently mentioned was *Not Sharing*. The only category that was identified regarding the Cause of andropause was *Hormonal Changes*. Some categories regarding the Control dimension of Leventhal et al. (2016) model were also identified in women's

speech, although no categories were identified regarding the Time frame dimension. In what concerns the negative perceived consequences of andropause, the most frequently reported category was *Sexual Function*, although a higher number of women reported a lack of information on Negative Consequences of andropause. Concerning perceived Positive Consequences of andropause, few women were able to identify any; consequently, the undefined consequences' categories *Absence of Positive Consequences* and *Lack of Information on Positive Consequences* revealed to be the most frequent ones. All emergent categories, along with its frequencies and with speech excerpts examples of each category are presented in Table 2.

Table 2. Emergent categories resulting from the directed content analysis regarding andropause representations.

Categories	Examples	*n* (NM)	*n*%
Identity			
Lack of Information on Andropause Characterization	"in such a way that I do not even know what the symptoms and signs are"	19 (40)	63.33
Not Sharing	"People shut in themselves, they don't like to… talk about it, it's part of their intimacy"	13 (25)	43.33
Aging	"it has to do with age"	13 (18)	43.33
Process Equivalent to Menopause	"it's more or less the equivalent to menopause in men"	13 (16)	43.33
Not so Noticeable	"Andropause doesn't have… how should I say… while in menopause there's… a visible sign, in andropause there isn't… that delimitation."	7 (8)	23.33
Changes in Libido	"the lack of…. of…. sexual appetite"	6 (9)	20.00
Erectile Dysfunction	"eventually an erectile dysfunction"	6 (8)	20.00
Physical Changes	"I think that there are changes at a physical level"	5 (11)	16.67
Lack of Patience/Irritability	"They become less… tolerant"	5 (8)	16.67
Perception of Loss	"I think they feel that something is lacking or something like that"	5 (6)	16.67
Virility	"There are men who don't accept it and think that they will remain virile all life"	5 (5)	16.67
Natural Process	"I think that andropause is part of life"	4 (4)	13.33
Weight Gain	"The majority also… gains weight"	3 (5)	10.00
Decrease in Sex Investment	"in sexual activity, I think that they also become more sloppy"	3 (4)	10.00
Tiredness/Less Energy	"But I think that there's more tiredness (…) more… more… they want to be quieter"	2 (8)	6.67
Decline of Reproductive Capability	"there's a decline in sperm quantity, so with age, they also have more difficulty in getting a woman pregnant"	2 (4)	6.67
Higher Intimacy in Relationship	"it is not so much the number of sexual relations but the quality; so, they start adopting a more concerned attitude towards being with their partners"	1 (5)	3.33
Fear of Worse Sexual Performance	"he gets afraid of not being able to satisfy his partner anymore"	1 (3)	3.33
Psychological Changes	"and even if there are modifications at a… hmm… psychological level"	1 (3)	3.33
Less Strength	"but they also feel, they also feel weaker"	1 (3)	3.33
Prostate Related	"men need to start doing that prostate routine examination"	1 (3)	3.33
Flaccidity	"the skin gets more sagged"	1 (2)	3.33
Body Image	"it depends on the way that a man faces his own body"	1 (1)	3.33
Depression	"they get depressed"	1 (1)	3.33
Mood Swings	"mood swings"	1 (1)	3.33
Behavioral Changes	"maybe some specific behavioral changes"	1 (1)	3.33
Health Problems	"they have health problems"	1 (1)	3.33
Unspecific Changes	"I know that they also suffer… a change"	1 (1)	3.33
Cause			
Hormonal Changes	"the hormonal change"	3 (3)	10.00
Control			

Categories	Examples	n (NM)	$n\%$
Need Acceptance	"look, they have to accept"	5 (14)	16.67
Difficulties in Coping	"a complicated time"	5 (8)	16.67
Search for Other Sex Partner	"There are even some men that search for other women because they think that at home is not the same thing… as it used to be… and then they don't realize that they are going through that transformation, and they go looking for… younger women, to prove that they remain active and so on"	5 (6)	16.67
Need for Medical Care	"also more marked by… by, by medical examinations"	4 (10)	13.33
Informal Social Support	"if there's good support from his partner, hmm… I think it's manageable"	4 (9)	13.33
Undefined Consequences			
Ambivalence	"So, that also can be… it has good things, but it can also have bad things"	2 (4)	6.67
Negative Consequences			
Lack of Information on Negative Consequences	"… I don't have much more knowledge, sincerely I don't. I don't know what I can say"	8 (9)	26.67
Sexual Function	"It… it may have negative consequences… if sexual performance is affected"	5 (11)	16.67
Depression	"they can also get depressed"	5 (6)	16.67
Tiredness/Less Energy	"then it also … a person gets more tired"	4 (7)	13.33
Irritability/Lack of Patience	"Yes [laughs] sometimes they get grumpy, sometimes they do"	4 (5)	13.33
Health Problems	"health problems emerge"	4 (4)	13.33
Prostate Problems	"problems at a prostate level"	3 (5)	10.00
Lack of Self-Confidence	"Men may lose a bit of self-confidence"	2 (4)	6.67
Self-Esteem	"less, yes, self-esteem"	2 (3)	6.67
Aging	"that feeling of aging"	2 (3)	6.67
Low Libido	"doesn't have libido"	2 (2)	6.67
Physical Changes	"beyond physical changes"	2 (2)	6.67
Psychological Changes	"sometimes psychological"	2 (2)	6.67
Virility	"feel less of a man"	2 (2)	6.67
Vasomotor Symptoms	"uh… I think it's negative to have those flushes"	2 (2)	6.67
Decrease in Social Life	"hmm, men socialize less"	1 (3)	3.33
Less Memory	"less memory"	1 (1)	3.33
Stress	"they start to be a bit stressed"	1 (1)	3.33
Life Changes	"life is not the same, their life is not the same"	1 (1)	3.33
Fear of Worse Sexual Performance/Experience	"It is the fear that they have of not being able to reach an end [in sexual activity]"	1 (1)	3.33
Sleep Disturbance	"more insomnia"	1 (1)	3.33
Positive Consequences			
Absence of Positive Consequences	"I don't see any positive consequences"	12 (16)	40.00
Lack of Information on Positive Consequences	"I don't know, I don't know if there are positive consequences"	11 (14)	36.67
Serenity	"calm… I think that they become calmer"	2 (5)	6.67
Higher Fidelity	"During that time they may be more loyal… [laughs]"	1 (1)	3.33
Activities Changes	"alternative activities (…) Instead of going backpacking for three or four weeks, they go for a smaller trip, to a quieter place, so… instead of looking for noisier environments, they look for quieter environments, which is also good"	1 (1)	3.33

Note: n = number of women who mentioned the category; NM = number of times the category was mentioned; $n\%$ = percentage of women who mentioned the category.

Two MCA were performed, one regarding Identity emergent categories and other- regarding perceived Negative Consequences of andropause. MCA was not performed for Cause, Control and perceived Positive Consequences of andropause due to their reduced total number of categories.

Table 3. Bi-dimensional model for the identity of andropause and for negative perceived consequences of andropause

Categories	Identity Factors	
	Aging-Related Changes **(α = .66)**	**Sexual Changes/Lack of Information** **(α = .62)**
Lack of Information on Andropause Characterization	.02	**.57**
Not Sharing	.00	**.26**
Process Equivalent to Menopause	.07	**.25**
Changes in Libido	.07	**.16**
Erectile Dysfunction	.01	**.11**
Virility	.00	**.21**
Decrease in Sex Investment	.01	**.54**
Aging	**.41**	.00
Not so Noticeable	**.20**	.04
Physical Changes	**.49**	.05
Lack of Patience/Irritability	**.12**	.01
Perception of Loss	**.41**	.13
Natural Process	**.24**	.00
Weight Gain	**.54**	.04
Eigenvalue	2.58	2.37
Variance explained by factors (%)	18.43	16.94
Categories	Negative Consequences Factors	
	Symptoms/Health Problems **(α = .51)**	**Depression/Lack of Information** **(α = .40)**
Sex Function	**.28**	.20
Health Problems	**.11**	.00
Depression	.24	**.53**
Tiredness/Less Energy	**.12**	.04
Irritability/Lack of Patience	**.47**	.07
Prostate Problems	**.43**	.16
Lack of Information on Negative Consequences	.13	**.51**
Eigenvalue	1.79	1.51
Variance explained by factors (%)	25.51	21.61

A bi-dimensional model was found for Identity of andropause (Table 3). In this model, the identified factors—*Aging-Related Changes* and *Sexual Changes/Lack of Information*—accounted for 35.37% of the variance of Identity of andropause. Regarding perceived Negative Consequences of andropause, a bi-dimensional model was also found. In this model, the identified factors—*Symptoms/Health Problems* and *Depression/Lack of Information*—accounted for 47.12% of the variance of perceived Negative Consequences of andropause.

Finally, differences in the frequency of emergent categories were assessed with Mann-Whitney U Tests, particularly regarding frequent emergent categories between groups of presence-absence of sociodemographic variables. No significant differences were found in any of the Mann-Whitney U Tests performed (as shown in Table 4).

Specifically, when considering the Identity of andropause, no differences were revealed in the frequency of the *Lack of Information* category between women with higher education and women with the 12th grade or less; in the frequency of the *Changes in Libido* and *Erectile Dysfunction* categories, neither between women currently in a romantic relationship and women who were not, nor between sexually active and sexually non-active women.

Table 4. Andropause representations: comparisons of participants with different characteristics

	Subgroup	*N*	Mean rank	*U*	*W*	Significance level[a]
Identity						
Lack of information	Higher education	15	16.93	134.00	254.00	.389
	12th grade or less	15	14.07			
Changes in Libido	With a romantic relationship	23	15.80	73.50	101.50	.737
	Without a romantic relationship	7	14.50			
	Sexually active	22	15.95	78.00	114.00	.662
	Non-active	8	14.25			
Erectile Dysfunction	With a romantic relationship	23	15.15	88.50	116.50	.701
	Without a romantic relationship	7	16.64			
	Sexually active	22	15.27	93.00	129.00	.836
	Non-active	8	16.12			
Negative Consequences						
Lack of information	Higher education	15	13.43	81.50	201.50	.202
	12th grade or less	15	17.57			
Positive Consequences						
Lack of information	Higher education	15	18.30	154.50	274.50	.081
	12th grade or less	15	12.70			

Note: [a] *p*-value (two-tailed) from Mann-Whitney U test.

  Concerning perceived Negative Consequences of andropause and perceived Positive Consequences of andropause, our results also revealed no differences in the frequency of the *Lack of Information* category between women with higher education and women with the 12th grade or less.

DISCUSSION

  The principal aim of this study was to explore Portuguese heterosexual women's representations of andropause and the potential suitability of the Leventhal et al. (2016) model in explaining those representations. According to our results, most of the Common-Sense Model dimensions—specifically, Identity, perceived Consequences, Control and Cause—were supported as suitable to explain andropause from women's perspective, having these several content similarities as those suggested by Hunter and O'Dea (2001) and Pimenta et al. (2020) in explaining menopause.

  Regarding emergent categories of the qualitative content analysis for Identity of andropause, a *Lack of Information* on andropause characterization prevailed among the high majority of women, being the next most frequent category mentioned related to *Not Sharing*—that is, a lack of social dialogue and sharing on the phenomenon. Similarly, the most frequent category on perceived Negative Consequences was again *Lack of Information*, being this followed by a category related to *Sexual Function*. Concerning perceived Positive Consequences, most women reported an absence of those and, once again, *Lack of Information*. Therefore, together these results are in line with the already highlighted general lack of knowledge and awareness on andropause and men's health (Corona et al., 2010; Harrison, 2011; Lee et al., 2009), with the phenomenon sometimes not being correctly identified (Pines, 2011). This suggests the need for more research and information on what characterizes andropause and its possible consequences, especially considering that women tend to

be health information-seekers for their own and for those in their families (Harrison, 2011), with their views and attitudes influencing those of men towards erectile dysfunction (Fisher et al., 2009a, 2009b)—a symptom frequently linked to andropause (Wu et al., 2010). Indeed, the fact that women in our sample perceived sexual function as a negatively impacted feature in men during andropause, and that several women perceived no positive consequences, this study alerts for the possibility of men not only experiencing andropause without recognizing it but also experiencing it negatively.

Still considering the qualitative content analysis performed, categories related to Control and Cause of andropause were also identified; however, no Time Frame references were found, which is also in accordance with the literature. Specifically, several emergent categories of the Control dimension mentioned by women were similar to those found by Hunter and O'Dea (2001) and Pimenta et al. (2020) to explain menopause (e.g., need for acceptance, difficulties in coping); moreover, the fact that there were no time frame mentions and that hormonal changes were pointed as the cause of andropause is in line with andropause resulting from a gradual decline in serum testosterone levels (Melby, 2006; Saad & Gooren, 2014; Yan, 2010), which is sometimes a more unnoticeable process in comparison to menopause (Anderson et al., 2002; Melby, 2006; Samipoor et al., 2017; Tan & Philip, 1999; Yan, 2010).

The two-dimensional models found for Identity and perceived Negative Consequences of andropause through MCA helped to clarify the associations between frequent categories mentioned by women. Regarding the two-dimensional model for Identity of andropause, the first factor, composed by categories linked to Aging-related changes such as physical changes, perception of loss and weight gain, might have emerged since these are diffuse symptoms of androgen deficiency that are identified by women as being part of the aging process of men, including several biological and social changes and losses (World Health Organization, 2015). The second factor, composed by categories linked to Sexual changes and Lack of information, such as the lack social dialogue *and sharing* regarding andropause, comparison of andropause with menopause as an equivalent process, *changes in libido* and a *decrease in sex investment*, seems to reflect that if not associated with age-related changes then it must be associated with physical changes (i.e., impaired sexual performance) that have a significant impact on the quality of life of both men and women (Novák et al., 2002). Together, these results reinforce andropause as a phenomenon that lacks awareness (Corona et al., 2010; Harrison, 2011; Lee et al., 2009), possibly confounded with the aging process (Melby, 2006; Saad & Gooren, 2014; Yan, 2010) and more consistently related with sexual features (Wu et al., 2010).

Similar suggestions are made by the two-dimensional model found for perceived Negative Consequences of andropause, where the first factor is composed by categories that relate to symptoms and health problems that, although in line with the andropause' symptoms pointed by the EMAS study (Wu et al., 2010), are not necessarily specific of andropause—such as tiredness/less energy and irritability/lack of patience—and the second factor is composed of depression and lack of information on negative consequences of andropause, which together seem associated with non-specific complaints (Novák et al., 2002; Pines, 2011). Andropause is associated with a largely non-specific sexual, physical, and psychological symptoms which are often identified in androgen deficiency of aging men in general (Huhtaniemi, 2014). Nevertheless, depression as a clinical manifestation of aging and of androgen deficiency is many often mis-diagnosticated over andropause (Harrison, 2011; Jakiel et al., 2015; Novák et al., 2002), prevailing a misleading conception for perceiving symptoms of andropause as being symptoms of depression in older men.

No differences were found through the Mann-Whitney U tests regarding the frequency that *Lack of Information* about andropause (which emerged both in Identity and Consequences) among women with different levels of education. This once more suggests the lack of information on andropause is not dependent on education level and reinforces the need to have more information available about the phenomenon. Further, no differences were found through the Mann-Whitney U tests regarding

the frequency of *Changes in Libido* (identity) and *Erectile Dysfunction* (identity) among women who were and who were not in a romantic relationship, and among women who were and who were not sexually active; this also suggests that these are stable representations among women, regardless of relationship/sexual activity status.

This consequently might call for some attention in the field of health-related information, because it shows the lack of information about andropause among women. Additionally, if andropause and menopause can occur concurrently and interdependently, affecting the sexual health of the couple it would be of significant importance to involve men's partners, since there is proof of the significance that a partner (namely in this study with heterosexual men, a women) can have for the men's satisfaction and quality of life (Fisher et al., 2005).

Some limitations of this research must be considered. Although the suitability of the Leventhal et al. (2016) model to explain andropause seems to be supported, this suitability must be considered a preliminary result, since we had only considered women's perspectives and had a non-probabilistic convenience sample of 30 women. Therefore, and despite the importance of women views on andropause, future research should be pursued to also assess men's perspectives on the phenomenon, and eventually to compare couple's perspectives. This is also a gap in the literature since few are the studies that have evaluated how the representations of andropause can affect men's sexual health and their intimate relationships (i.e., sexual satisfaction) (Jannini & Nappi, 2018).

These preliminary results concerning the representations of women about the andropause process contribute to the research in this scope – which is scarce in the Portuguese population – and, also to clinical practice, allowing to guide future interventions focusing couples that are facing andropause and/or menopause. Future studies with other cultures are needed to better understand these outcomes.

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