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**Emotional Intimacy and Distress about Sexual Difficulties in Partnered Older European
Men and Women: A Network Analysis** 

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Abstract:

Although research in older individuals' sexual health is steadily increasing, the nature of, and predictors related to, their distress about changes in sexual function have not been well-studied. Using data from sexually active and partnered 1,047 Norwegian and Danish women and men aged 60-75 years, this study employed network analysis to explore the structure of older individuals' sexual distress and the role of emotional intimacy. Men's network of sexual distress facets was more densely interconnected than women's network. Higher emotional intimacy was associated with lower sexual distress levels across gender. The findings have implications for sexual health interventions targeting older people.

Key Words: Sexual difficulties, distress, emotional intimacy, older individuals, network analysis

Emotional Intimacy and Distress about Sexual Difficulties in Partnered Older European Men and Women: A Network Analysis

INTRODUCTION

Sexual activity remains important for many older men and women (DeLamater, 2012; Træen, Hald, et al., 2017)—particularly those in relationships (Harder et al., 2019; Hinchliff, Tetley, Lee, & Nazroo, 2018; Orr, Layte, & O’Leary, 2019), despite the fact that sexual function is affected by aging (Hendrickx, Gijss, & Enzlin, 2015; Kleinstäuber, 2017; Lindau et al., 2007). The experience of sexual function disturbances may affect older adults’ well-being and successful aging (Štulhofer, Hinchliff, Jurin, Hald, & Træen, 2018). As with younger adults, this experience can also have detrimental effects on aging individuals’ relationships—which can be particularly distressing. However, research on distress about sexual difficulties (hereafter, DASD) in this population is lacking¹. Considering growing expectations of sexual vitality in the aging population of developed Western countries (Katz & Marshall, 2003; Træen, Carvalheira, et al., 2017; Træen et al., 2019), research on older people’s sexual distress has important public health and clinical implications. To begin to fill the gap in knowledge about DASD among partnered older individuals, the current study explored the structure of DASD and the contribution of emotional intimacy to sexual distress.

Sexual Difficulties and Sexual Dysfunctions

Although many older adults experience negative changes in their sexual functioning (Hald et al., 2019; Kleinstäuber, 2017), a large proportion of them do not report worry or distress about these changes (Laumann, Glasser, Neves, & Moreira, 2009). Reasons for this are likely multiple,

¹ In this paper, we use the phrases *distress about sexual difficulties (DASD)*, *distressing sexual difficulties*, and *sexual distress* interchangeably. In addition, the phrases *sexual difficulties* and *sexual disturbances* are used as synonyms.

including beliefs that the changes in sexual function are an inevitable part of the aging process, that the changes are not that serious, and that they will go away with time (Laumann et al., 2009). In addition, a lack of information about aging and sexual health (Erens et al., 2019), and barriers to discussing sexuality-related issues with medical health professionals (Gott, Hinchliff, & Galena, 2004; Kleinstäuber, 2017) are likely to result in a conviction that there is not much else that one can do about deteriorating sexual functioning but to cope with it. However, many older women and men are deeply concerned about their sexual health difficulties, as was observed in a recent large-scale longitudinal study of 50-90 year old English women and men (Hinchliff et al., 2018).

Clinical and epidemiological researchers have long recognized the importance of distinguishing between a sexual difficulty and a sexual dysfunction (Fugl-Meyer & Fugl-Meyer, 1999)—the former term denoting a negative change in sexual functioning that may or may not be distressing and the latter representing a distressing negative change (Hendrickx, Gijs, & Enzlin, 2013). Indeed, according to the Diagnostic and Statistical Manual of Mental Disorders (American Psychiatric Association, 2013) symptoms need to be associated with clinically significant distress in order to be considered a sexual dysfunction. It has been shown that the proportion of individuals who report DASD is markedly and consistently smaller than the proportion of those who experience one or more sexual difficulties (Christensen et al., 2011; Hendrickx, Gijs, & Enzlin, 2014; K. R. Mitchell et al., 2016; Shifren, Monz, Russo, Segreti, & Johannes, 2008). This has prompted suggestions that DASD and not a disturbance in sexual functioning *per se* indicate a clinically relevant sexual health difficulty (Bancroft, Graham, & McCord, 2001; Hendrickx et al., 2013; Meana, 2010; K. Mitchell & Graham, 2008; Öberg, Fugl-Meyer, & Fugl-Meyer, 2002).

Aging and Sexual Distress

According to social stereotypes about aging and sexuality, older people have little if any sexual interest (Gott et al., 2004; Inelmen et al., 2012). Although research about the acceptance of these stereotypes among older adults is largely missing (Syme & Cohn, 2016), there is some evidence that older men and women may be less likely to report DASD than younger adults (Hendrickx, Gijs, & Enzlin, 2019; Shifren et al., 2008; Træen, Hald, et al., 2017) even when confronted with sexual function-related problems. As reported by a large-scale study of sexual difficulties and dysfunctions among Danish adults aged 16-95 years (Christensen et al., 2011), DASD levels—with the exception of those associated with erectile and orgasmic difficulties in men—were consistently lower in the 60+ years cohort than among younger participants. However, as emphasized in a recent overview, the dynamics of DASD in older adults are not well-studied (Træen, Hald, et al., 2017), so it is unclear whether this difference reflects a lesser emphasis on sexuality among older individuals, a greater acceptance of health-related changes that accompany aging, more perceived barriers to help-seeking for sexual difficulties, or something else.

Emotional Intimacy and Aging Adult's Sexuality

Hendrickx and colleagues (2013) proposed that different types of sexual distress should be distinguished and assessed—specifically personal, perceived partner, and relational distress. In their recent large-scale study, the authors observed a substantial overlap among these types of distress, with personal distress being the most prevalent and the other two types commonly co-occurring (Hendrickx et al., 2019). Considering consistent evidence on the link between emotional closeness, relationship quality, relationship satisfaction, and sexual functioning in older age (Fisher et al., 2015; Galinsky & Waite, 2014; Hinchliff et al., 2018; Štulhofer, Jurin, Graham, Janssen, & Træen, 2019), the interrelatedness between personal, partner, and relational sexual distress is not surprising. As highlighted in a recent qualitative study (Hinchliff et al.,

2018), the link between relationship quality and sexual distress is not unidirectional. On the one hand, a good relationship may buffer DASD (Erens et al., 2019; Štulhofer, Hinchliff, & Træen, 2019), but also—at least theoretically—increase sexual distress due to fear of damage that a sexual difficulty might do to a highly valued relationship. On the other hand, sexual difficulties and the associated distress can damage the quality of relationship (e.g., by couples avoiding physical touch altogether)—particularly if no professional help is sought (Hinchliff et al., 2018).

Another recent study addressed a link between emotional closeness and sexual distress, albeit indirectly. In a mixed-method study that used data from the British NATSAL-3 survey, Erens et al. (2019) observed that when one or both partners' ill health affected their sexuality, the emotional quality of the relationship (more vs. less close relationships) determined the couple's compensatory mechanisms. Close and intimate relationships provide support and likely facilitate coping with sexual disturbances and the ensuing decrease in the frequency (or even cessation) of sexual activity. In addition, emotional closeness may enable partners to bypass a sexual difficulty by turning to other forms of sexual expression (Erens et al., 2019). For example, if a male partner is having erection difficulties, couples may engage in non-penetrative sexual activities (Sandberg, 2011; Ussher, Perz, Gilbert, Wong, & Hobbs, 2013). While sexual difficulties and DASD in less intimate relationships can lead to chronic resentment and the avoidance of physical touch, this is less likely to happen in more emotionally connected older couples (Hinchliff et al., 2018).

The (Moderating) Role of Gender

Previous research has demonstrated some differences in how older men and women experience sexual difficulties. For instance, an earlier cross-cultural study found that age affected male sexual functioning more than female (Laumann et al., 2005). Similarly, the English Longitudinal Study of Aging found that sexually active aging men were more concerned about their sexual health than women at any age (Lee, Nazroo, O'Connor, Blake, & Pendleton, 2016).

However, to what extent these differences are related to traditional gender roles and the imperative of penile functioning for aging men's identity has not been established.

Apart from age, the association between emotional connectedness and sexuality in older adults may also be dependent on gender (Heiman et al., 2011). In support of this, a recent cross-cultural dyadic study found that older men's reports of emotional intimacy were predictive of their female partner's sexual activity and sexual well-being, but not vice versa (Štulhofer et al., 2019). In conclusion, the contribution of gender needs to be controlled for when exploring DASD in partnered older individuals.

Current Study

To the best of our knowledge, this is the first attempt to assess the network structure of DASD (not only among aging adults) and its relation to emotional intimacy. Given its exploratory nature, the current study was organized around two research questions: (1) What is the structure of older individuals' DASD, and (2) what is the role of emotional intimacy in DASD? To answer these questions we utilized a novel network approach to psychological problems (Cramer & Borsboom, n.d.; Nuijten, Deserno, Cramer, & Borsboom, 2016; Schmittmann et al., 2013), which has only recently been applied to the study of human sexuality (Gunst et al., 2018; Werner, Štulhofer, Waldorp, & Jurin, 2018). Contrary to the traditional view of a disorder being a common cause underlying the observed symptoms, this approach conceptualizes mental disorders as dynamic systems of interrelated symptoms (Borsboom, 2008). The stronger the associations between symptoms, the more likely the disorder (Borsboom, 2017). It should be noted, however, that the current study focuses on sexual distress, which means that—unlike in the case of a mental disorder—nodes do not represent symptoms, but facets of DASD. The stronger the associations among the facets, the more complex or multi-dimensional the

sexual distress. Thus, network edges in a sexual distress network reflect specific distress comorbidity.

Compared to more commonly used statistical approaches to address the structure of complex phenomena, such as exploratory factor analysis and cluster analysis, the network approach has at least two advantages. Firstly, it enables a more detailed and systematic insight into the structure of a phenomenon by considering associations between all pairs of symptoms or other elements of the phenomenon in question. Secondly, the approach has clear clinical implications. For example, network analysis can provide novel insights into comorbidity by pointing to symptoms shared by different disorders, or suggest an intervention targeting one or more symptoms that are centrally positioned in a specific psychopathology network (Borsboom, 2017; Fried et al., 2017).

MATERIALS AND METHODS

Participants and Procedure

Data used in this study were collected in 2016 as part of a larger research project that focused on sexual health in aging individuals and couples in four European countries. To obtain probability-based national samples of men and women aged 60-75 years (for details, see Træen et al., 2019), national phone registries were used in Norway, Denmark and Belgium. Contacted individuals who agreed to participate were then sent an anonymous postal questionnaire in an envelope with pre-paid return postage. As a national phone registry was not available in Portugal, multi-stage stratified sampling was employed. Participation rates were 68% in Norway, 57% in Belgium, 52% in Denmark, and only 25.5% in Portugal.

Only Norwegian ($n = 611$; 42% women) and Danish participants ($n = 436$; 45% women) who reported being in a steady relationship (the average duration of participants' relationships was 35.2 years; $SD = 15.60$) and sexually active in the past 12 months were included in this

study. The Portuguese and the Belgian samples were excluded from the analyses reported here—the former because of the different sampling strategy and high non-response and the latter due to an inexplicably low proportion of male participants (32%, compared to 53% in the Norwegian, 51% in the Danish, and 46% in the Portuguese samples).

Measures

Sociodemographic Indicators. Education was assessed as the highest level of schooling attained (1 = primary, 2 = secondary, and 3 = tertiary education). Religiosity was indicated by the frequency of attending religious ceremonies (1 = never to 7 = once a week or more often). The size of participants' place of residence (*How would you describe the place you live?*) was a categorical variable that was recoded into 1 = rural place, 2 = small town, 3 = medium sized city, 4 = large city.

Distress about Sexual Difficulties. Participants were first asked about the occurrence of eight sexual difficulties for a period of three months or longer: *lacked interest in having sex; lacked enjoyment in sex; felt anxious during sex; felt physical pain as a result of sex; felt no excitement or arousal during sex; did not reach a climax (experienced an orgasm)/ took a long time to reach a climax despite feeling excited/aroused; reached a climax (experienced an orgasm) more quickly than you would have liked; uncomfortably dry vagina (women only); had trouble getting or keeping an erection (men only).* The list of symptoms was adapted from those used in the NATSAL-SF measure (Jones et al., 2015; K. R. Mitchell, Ploubidis, Datta, & Wellings, 2012). Following this, for each sexual difficulty reported, the participant was asked about the level of associated distress (1 = no distress to 4 = severe distress); individuals who reported no specific difficulty (and, thus, skipped the distress question) were coded 0. The item *felt anxious during sex* was omitted from the network analysis due to its overlap with the associated distress.

Emotional Intimacy. The level of *emotional intimacy* in the current relationship was measured by the 5-item Emotional Intimacy Scale (e.g., *I can share my deepest thoughts and feelings with this person* and *This person cares deeply for me*) (Sinclair & Dowdy, 2005). A Likert type 5-point scale (1 = agree strongly to 5 = disagree strongly) was used to anchor answers. The items were averaged to form a composite indicator that had a high reliability in both national samples (Cronbach's $\alpha = .89$ and $.90$). The composite scores were reversed, so that higher scores denote higher intimacy. No significant gender or country differences in mean intimacy scores were observed. To compare participants who reported different levels of emotional intimacy, the composite scores were tertiled. Following this categorization, the polar opposites approach was used (Hair, Black, Babin, & Anderson, 2010): older individuals in the first tertile (low intimacy participants) were compared with their peers in the third tertile (high intimacy participants).

Network Analysis

The sexual distress network was estimated via a Gaussian graphical model (GGM; Lauritzen, 1996), which represents an undirected network of conditional associations (Epskamp, Waldorp, Möttus, & Borsboom, 2018). The network consists of nodes, which represent different facets of sexual distress (i.e., distress related to different sexual difficulties), and edges—or links between the nodes—which are represented by partial correlations. Thus, edges indicate conditional dependence between any two nodes after controlling for their relationship with all remaining nodes (Epskamp & Fried, 2018). Due to ordinal measurement of distress items, a polychoric correlation matrix was used as the input for the analysis (Beard et al., 2016). To regularize GGMs and prevent false-positive edges, we used graphical LASSO (Least Absolute Shrinkage and Selection Operator) estimator in combination with EBIC model selection (Epskamp & Fried, 2018). This algorithm penalizes overly complex networks, leading to sparser

and more stable solutions in which weak edges are omitted from the model (Epskamp, Borsboom, & Fried, 2018). Gender-specific sexual distress networks were visualized using the Fruchterman-Reingold algorithm. To facilitate comparisons across gender and emotional intimacy levels, we employed joint layout in which nodes are positioned identically across gender- and intimacy-specific networks, respectively. When visualizing the network, solid lines represent positive and dashed lines negative associations; the strength of edges is indicated by their thickness and shading.

To test for possible cultural differences, Norwegian and Danish participants' networks were compared, separately by gender, using the Network Comparison Test that examines network invariance at three levels: global network structure, global network connectivity, and specific edge strength (H. P. Santos, Kossakowski, Schwartz, Beeber, & Fried, 2018; Van Borkulo, 2019; Van Borkulo et al., 2016). We observed no significant differences in global network structure ($M_{\text{men}} = 0.25, p = .732; M_{\text{women}} = 0.30, p = .266$) or connectivity ($S_{\text{men}} = 0.23, p = .769; S_{\text{women}} = 1.21, p = .120$) between the two country-specific networks in either gender group. Thus, we conducted further gender-specific analyses on pooled samples (i.e., Norwegian and Danish participants combined).

Next, to examine the differential importance of nodes, we used the expected influence centrality measure (EIM; Robinaugh, Millner, & McNally, 2016). The central node in a network is characterized by the highest sum of edge weights—i.e., by the strongest direct links with other nodes. Unlike the usually employed metric of strength centrality, which is based exclusively on absolute values of edges, expected influence takes into account the sign of partial correlations—which is preferred when the network of interest contains both positive and negative edges. In the final step, we explored the stability of network estimations (Epskamp et al., 2018). Non-parametric bootstrapped 95% confidence intervals (CIs) around edge weights were used as

indicators of the accuracy of strength estimations, as well as of substantial differences in strength across edges. To test the stability of the EIM, case-dropping subset bootstrap was utilized to correlate an EIM value obtained with all available cases, with values obtained with less and less cases. In this method, the so-called correlation stability coefficient is defined as the maximum proportion of cases that can be dropped, such that the association between the initial and subsequent (i.e., based on subsets of cases) EIM values is $\geq .70$ (with 95% probability). According to simulations, the stability coefficient should not be $< .25$ and preferably be $> .50$ (Epskamp et al., 2018).

Finally, to explore which nodes were more likely to be “clustered” together or, in the language of network psychometrics, belong to the same subset of interconnected nodes, we used exploratory factor analysis (EFA) with maximum likelihood extraction and oblimin rotation. Parallel analysis, which has recently been found to be a highly precise method of estimating dimensionality when the number of factors is < 4 , correlations between latent dimensions are not strong ($< .7$), number of items per factor is ≥ 5 , and sample size is approaching 500 (Golino & Epskamp, 2017), was used to identify underlying structure (Wood, Gnonhosou, & Bowling, 2015). In the current study, three of the four conditions were met. Number of items per factor was restricted by the available distress items (8 in each gender group).

Statistical analyses were carried out in IBM SPSS 24 and R (Version 3.5.2.), with *psych* (Revelle, 2019), *qgraph* (Epskamp, Cramer, Waldorp, Schmittmann, & Borsboom, 2012), *bootnet* (Epskamp, 2019), and *NetworkComparisonTest* packages (Van Borkulo, 2019).

RESULTS

Sample Characteristics

Overall, Norwegian participants (7.3% primary and 56.7% tertiary educated) had higher formal education than Danish participants (22.3% primary and 39.8% tertiary educated).

Religiosity levels were similar in the two countries, with 34.2% of Norwegian and 30.8% of Danish participants reporting no church attendance, and 17.7% and 13.2% of participants, respectively, reporting attending religious ceremonies at least once a month. Urban-rural divide was also comparable in the two samples. Rural place of residence was reported by 33.0% of Norwegian and 37.8% of Danish men and women. Much smaller proportions of participants (19.6% and 14.5%, respectively) resided in a large city.

Mean DASD levels were 1.50 ($SD = 0.63$) among Norwegian women and 1.76 ($SD = 0.65$) in Norwegian men, and 1.63 ($SD = 0.64$) in Danish women and 1.29 ($SD = 0.56$) in their male compatriots. Significant differences between the two countries were observed in male ($t(46) = 2.67, p = .010$) but not female participants' levels of sexual distress ($t(45) = -0.69, p = .493$).

Table 1 presents the prevalence of sexual difficulties and sexual distress in older women and men, separately for the three emotional intimacy sub-groups. Among female participants, the two most prevalent sexual difficulties were inability to reach orgasm and uncomfortably dry vagina during sex. For both of these difficulties, we observed significant differences in the prevalence of the sexual difficulties ($\chi^2 = 15.58, p < .001$ and $\chi^2 = 13.58, p = .001$, respectively) among the participants in the low, moderate, and high intimacy groups. Compared to women in the high intimacy group, those who reported low emotional intimacy with their partner were characterized by higher prevalence of these difficulties. Women's sexual distress levels were the highest in the cases of dry vagina and physical pain, but we observed no significant association with emotional intimacy levels.

Among male participants, the two most prevalent sexual difficulties were erectile difficulties and reaching orgasm too quickly. Levels of emotional intimacy were negatively related only to the prevalence of erectile problems ($\chi^2 = 7.00, p = .030$). Sexual distress levels in

men were the highest in the cases of erectile difficulties and difficulties in reaching orgasm. The tendency for men in the high emotional intimacy group to report lower sexual distress about their erectile function than men in the low intimacy group was bordering on significance ($\chi^2 = 12.41$, $p = .053$).

TABLE 1 ABOUT HERE

Network Analysis

Country-invariant male and female sexual distress networks are shown in Figure 1. Although direct comparisons are not warranted because of a node (Distress 8M and 8F) that differed in the two networks, two structural differences were observable. First, the female network was sparser or less connected than the male network. This is reflected in a higher global connectivity estimate (i.e., the sum of edge weights' absolute values) obtained in the male network ($S_{\text{men}} = 2.04$; $S_{\text{women}} = 0.46$). Secondly, although the two networks exhibited similar patterns of node centrality (see Figure 2), the most central, or influential, node was gender-specific. In the male network, the highest expected influence was obtained for distress about no excitement or arousal, closely followed by distress related to a lack of enjoyment in sex—which was the most influential node in the female network.

FIGURES 1 AND 2 ABOUT HERE

Next, we explored the stability of the two networks. Bootstrapped 95% confidence intervals around regularized edges were relatively wide (see supplementary material), which means that the accuracy of edge strength, but not their presence, was limited (Epskamp,

Borsboom, et al., 2018). This is not an unusual finding in network analysis, due to limited sample size (see, for example, Santos et al., 2018). In contrast, the expected influence measure displayed solid stability; the correlation stability coefficient was .75 in both networks. Its robustness was higher than the stability of strength centrality (graphical presentation is provided in supplementary material), which seems to be the most robust among the standard centrality indices (Epskamp et al., 2018).

Finally, to address communities of nodes, which are identical to latent or underlying dimensions (Golino & Epskamp, 2017), we used EFA with oblique rotation and parallel analysis of the number of factors by gender. In the female network model, parallel analysis resulted in three factors: F1 = distress about a lack of excitement/arousal, no enjoyment, and orgasmic difficulties; F2 = distress about vaginal dryness and pain triggered by sex; and F3 = distress related to a lack of interest in sex. Distress about rapid orgasm loaded marginally (.23) on the first factor. Three factors were also identified in the male network model: F1 = distress about a lack of excitement/arousal, no enjoyment, and sexual interest; F2 = distress over erectile and orgasmic difficulties; and F3 = distress about rapid ejaculation. Distress related to physical pain loaded on the first factor, but substantially lower (.35) than the other three nodes.

The highest correlation between the sexual distress communities (i.e., latent dimensions) was observed between F1 and F2 in both the female ($r = .50$) and male ($r = .58$) samples. The findings indicated a higher overlap between the first two communities than between either of them and F3.

The Role of Emotional Intimacy

To explore the link between emotional intimacy and the structure of sexual distress, we compared sexual distress networks in individuals who reported high and those who reported low emotional intimacy with their partner, separately by gender. Because of the polar opposite

approach, which reduced problems associated with dichotomization, the two groups' size was relatively small and unequal in both genders ($n_{\text{women}} = 190$ high and 120 low; $n_{\text{men}} = 220$ high and 140 low intimacy individuals). In both the female and male samples, participants in the high intimacy group reported lower average levels of sexual distress compared to their peers in the low intimacy group ($t(188)_{\text{female}} = 3.58, p < .001, \text{Cohen's } d = 0.44$ and $t(358)_{\text{male}} = 2.12, p = .035, d = 0.23$).

Figures 3 and 4 present the sexual distress network in female and male participants, separately for low and high emotional intimacy groups. Two network characteristics were compared across groups: overall connectivity, represented by the sum of absolute values of all edge weights in the network, and expected influence centrality (the most central node is characterized by the highest sum of direct edge weights). Among women, the two networks somewhat differed in overall connectivity ($S_{\text{high intimacy group}} = 3.14$ and $S_{\text{low intimacy group}} = 2.67$). Of the total of 21 edges, there were 13 non-zero edges in the high intimacy and 12 in the low intimacy networks. In addition, there were three negative edges in the former and none in the latter networks. Expected influence was also intimacy-specific. Whereas distress about no excitement or arousal during sex had the highest expected influence in the high intimacy network, the most influential node in the low intimacy network was distress related to a lack of enjoyment in sex.

Differences in global network connectivity in the male sample were in the same direction as in the female sample (i.e., in both gender groups high intimacy was associated with more interconnectedness among nodes or facets of distress), but more substantial. The connectivity estimate was 4.82 for the high intimacy sexual distress network and 2.78 in the low intimacy network. Unlike in the low intimacy network, where 16/21 edges had non-zero values, all edges in the high intimacy network were substantially different from zero. We also found differences in

expected influence in the two networks. In the high intimacy men’s network, the highest influence was observed for distress related to no excitement or arousal during sex—as was the case in female participants who reported high emotional intimacy with their partner. Among the low intimacy men, we found distress related to a lack of enjoyment in sex and distress about sex-related physical pain the most influential nodes.

Given that the Network Comparison Test is very sensitive to power (i.e., sample size) and, in different ways, network sparsity (Van Borkulo et al., 2016), significance of the observed differences in distress networks among high vs. low emotional intimacy reporting women and men could not be assessed. Thus, caution is warranted when interpreting the association between emotional intimacy and the structure of sexual distress.

FIGURES 3 AND 4 ABOUT HERE

DISCUSSION

Although sexual activity is an integral part of many older adults’ subjective and psychological well-being (Smith et al., 2019; Wang et al., 2015), little is known about sexual distress related to changes in sexual function in this population. In this exploratory study, we used a network analysis approach—in which facets of sexual distress are represented as nodes and relationships between them as edges—to investigate the structure of sexual distress among a sample of 60-75-year-old Scandinavian men and women, all in steady relationships. We also explored whether levels of emotional intimacy they reported in their current relationship were related to the levels and structure of reported sexual distress. Mean levels of DASD for both men and women were low in our sample, which supports previous findings that many older adults

with sexual function difficulties may experience little to no distress about these (Hald et al., 2019; Træen, Hald, et al., 2017).

The structure of DASD did not substantially differ between the two Scandinavian countries, but gender differences were observed when exploring the central and most influential sexual distress node in both female and male networks. For women, the most central node was distress related to a lack of enjoyment during sex, whereas for men it was distress about lacking excitement and/or arousal during sex. Research using network analysis in other clinical areas such as depression has demonstrated that a more connected network of symptoms is associated with greater severity of depressed mood (Santos, Fried, Asafu-Adjei, & Jeanne Ruiz, 2017). The finding that the male sexual distress network was more interconnected than female network thus points to a greater risk of reduced psychological well-being among men after experiencing sexual difficulties. Consistent with this, in a recent dyadic study of older couples from four European countries, men were more likely to have sought help for sexual difficulties than their female partners (Hinchliff et al., 2019). Another recent large-scale study carried out among older English individuals found that sexually active men were more concerned about their sexual health than women (Lee, Nazroo, O'Connor, Blake, & Pendleton, 2016).

In network analysis, communities represent nodes that are more closely interlinked compared to other nodes in a network (Golino & Epskamp, 2017). In the current study, three communities were identified in both female and male sexual distress networks. For women, the first community included distress about lack of excitement/arousal, lack of enjoyment, and orgasmic difficulties; the second, distress related to vaginal dryness and pain during sex; and the final community, distress related to lack of interest in sex. For men, the first community comprised distress about lack of excitement/arousal, lack of enjoyment, and lack of interest in

sex; the second, distress about erectile and orgasmic difficulties, and the third, distress about rapid ejaculation. In both groups, the third community was weakly connected to the other two. Future research should explore if this relatively isolated position in the sexual distress network may reflect the distinct character of these sexual difficulties. It is possible that the third community represents a distress that is partner- rather than individual-related. Compared to other sexual distress facets, distress about lacking interest in sex and rapid ejaculation may be more problematic for the partner (and relationship) than the person experiencing it.

Motivated by a lack of systematic research on the association between sexual health and emotional intimacy in older adults, we also addressed the role of emotional intimacy in the DASD network. In both gender groups, individuals who reported higher levels of intimacy with their partner evidenced lower levels of sexual distress than those who reported lower emotional intimacy. The findings suggest that emotional intimacy may buffer adverse effects of one or more sexual difficulties. This is supported by qualitative studies of older adults that highlight the importance of emotional intimacy (Hinchliff et al., 2018), as well as by recent findings that emotional intimacy predicts sexual well-being in both older men and women (Štulhofer, Jurin, et al., 2019). Several studies have also suggested that for some older adults physical closeness and intimacy may be more important than the frequency of sexual activity (Fileborn et al., 2015; Freak-Poli et al., 2017; Lee et al., 2016).

When DASD networks were compared across participants who reported high vs. low emotional intimacy with their partner, in both gender groups high intimacy was associated with more interconnectedness among nodes or facets of distress. This suggests that clinical interventions might be more effective in the high intimacy group, because an intervention focusing on reducing distress about a specific sexual difficulty will be more likely to also reduce

other, co-morbid, distress facets in a more interdependent network—particularly if the targeted distress has high centrality in the network.

For both men and women who reported high emotional intimacy with their partner, the strongest influence in the overall DASD network was distress related to lacking excitement and/or arousal during sex. In contrast, the central distress in participants who were characterized by low emotional intimacy with their partner was gender-specific. Among women, the strongest influence was associated with distress about lacking enjoyment in sex, whereas for men the most central position in the network was shared by distress about a lack of enjoyment and physical pain associated with sexual activity. Although caution is needed when interpreting these results—primarily due to their low power and questionable robustness of the centrality estimates—they suggest that sexual distress among older women and men who reported high emotional intimacy is less influenced by problems related to sexual enjoyment, compared to their low intimacy peers. However, the central distress point in their DASD network was a lack of excitement, possibly due to sexual dynamics in emotionally close long-term relationships (Liu, 2003; Schmiedeberg & Schröder, 2016); the average relationship duration in our study was > 35 years. In contrast, the network of sexual distress representing participants who reported a less intimate bond with their partner was mostly influenced by distress about sex not being enjoyable, which may reflect relationship problems. As discussed in the literature, lack of sexual enjoyment may be a cause, but also a consequence of problematic relationships (Christopher & Sprecher, 2000). Additional research would be needed to replicate the observed discrepancy in network centrality and, provided our findings are corroborated, to explore intra- and interpersonal mechanisms underlying associations between emotional intimacy and sexual distress in aging women and men.

Clinical Implications

As noted by Gunst et al. (2018), an advantage of the network approach is that it can provide clinically useful information for health professionals working with older adults. In our study, we have identified key elements of sexual distress among older men and women, and highlighted the role that emotional connectedness may play in the configuration of DASD. Because DASD influences help-seeking (i.e., individuals with a higher level of distress are more likely to seek professional help; Hinchliff et al., 2019), our findings that individuals who reported more emotional intimacy in their relationship were characterized by lower DASD compared to those reporting low emotional intimacy suggest that the latter may be more likely to seek professional help. It is also possible that highly intimate individuals are more likely to successfully resolve or reduce DASD due to partner support. In the qualitative study by Hinchliff et al. (2018), some participants mentioned becoming more intimate as a way to deal with adverse age-related changes in sexuality. This suggests that, when feasible, interventions should include or even focus on enhancing couple intimacy, considering that such an approach may be more successful in reducing sexual distress than efforts to fully restore sexual function—which in many older adults may be difficult due to a combination of chronic health conditions and related medication (Field et al., 2013).

Study Limitations

This study's findings need to be weighed against some limitations. In studying DASD among partnered older individuals, all participants who did not report a specific sexual difficulty were assigned a DASD level of 0. This affected the distribution of DASD and, most likely, reduced correlations, potentially leading to the omission of some edges from the overall structure. Although the accuracy of centrality indices was satisfactory both in male and female networks, edge weights displayed limited stability. Limited statistical power was more problematic in the

exploration of high vs. low emotional intimacy networks. Future research should scale up sample size to provide more stable and robust results.

In addition, the important association between DASD and seeking professional help for sexual disturbances is likely more complex than outlined in the previous section. The important question to address in future studies is whether help seeking is more dependent on DASD levels or the network interconnectedness (i.e., links between different components of sexual distress), or a specific combination of the two—controlling for emotional intimacy. It should be noted that higher interrelatedness between different sexual distress facets enables a ‘spillover’ or a faster accumulation of sexual distress. The more interconnected the network, the faster the spread of activity (i.e., node activation) throughout the network. However, a longitudinal network approach, which would elucidate changes in the network structure of DASD—both at within- and between-individual levels—is needed to address this question.

CONCLUSIONS

In this study of sexual distress among older Scandinavian individuals, we analysed the prevalence and facets of sexual distress in two probability-based community samples. Using a network analysis, we explored the gender-specific configuration of sexual distress network and the role of emotional intimacy. The approach enabled novel insights about sexual distress in aging individuals, that point to some interesting avenues for clinical interventions for older adults with distressing sexual difficulties.

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Conflict of interest:

The authors declare no conflict of interest.

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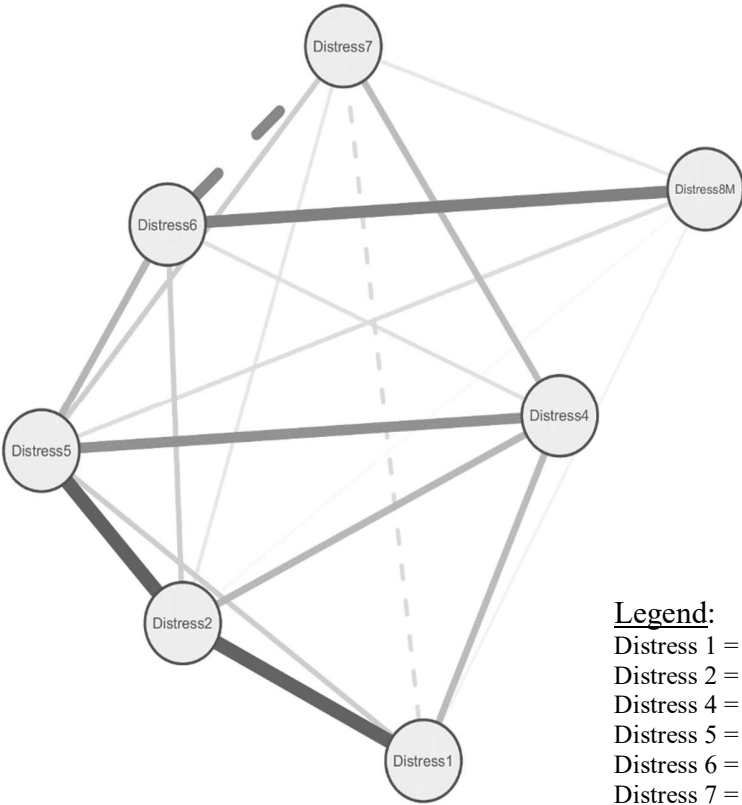
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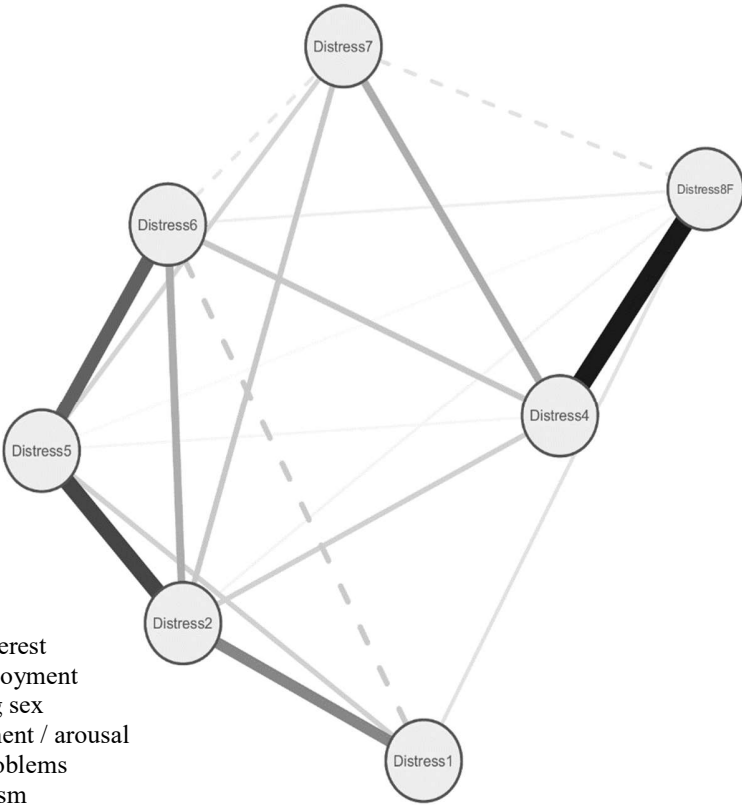
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Figure 1 - Sexual Distress Network in Older Norwegian and Danish Individuals by Gender

Men

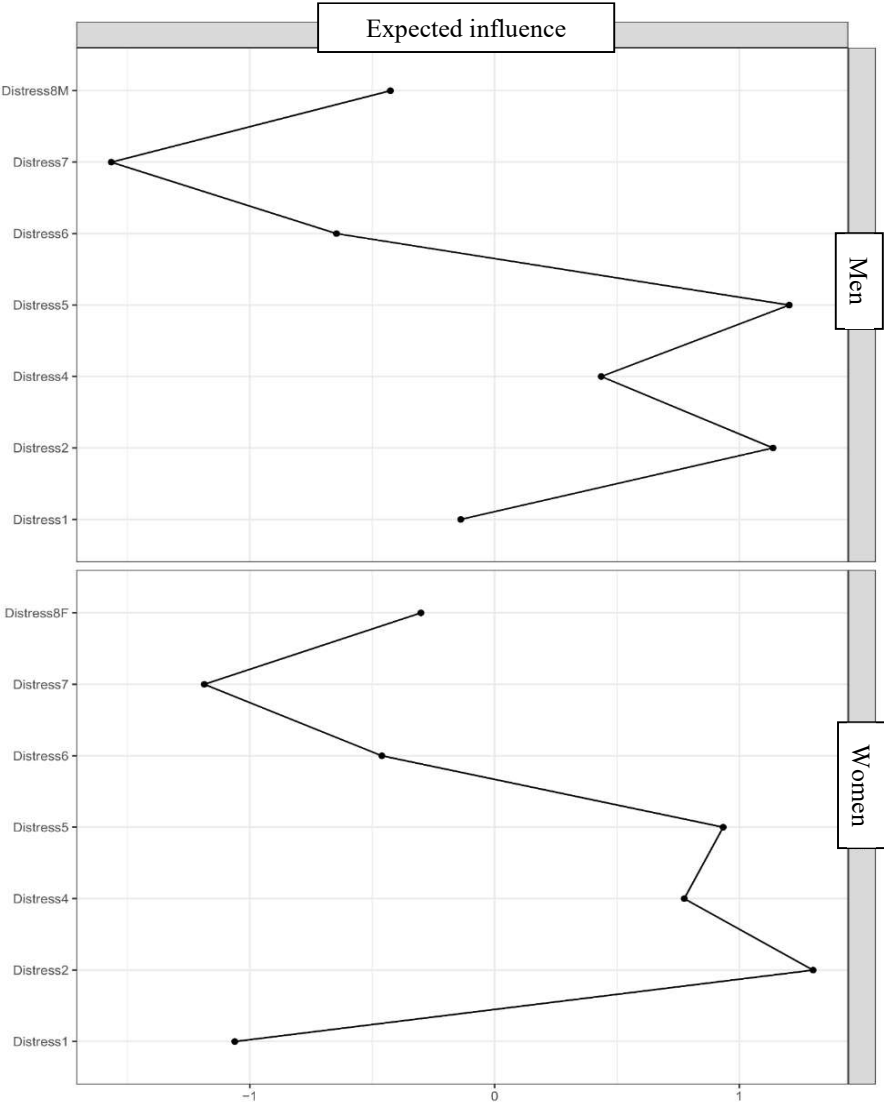


Women



- Legend:**
 Distress 1 = Lack of Interest
 Distress 2 = Lack of enjoyment
 Distress 4 = Pain during sex
 Distress 5 = No excitement / arousal
 Distress 6 = Orgasm problems
 Distress 7 = Rapid orgasm
 Distress 8M = Erectile problems
 Distress 8F = Vaginal dryness

Figure 2 – Expected Influence Node Centrality by Gender

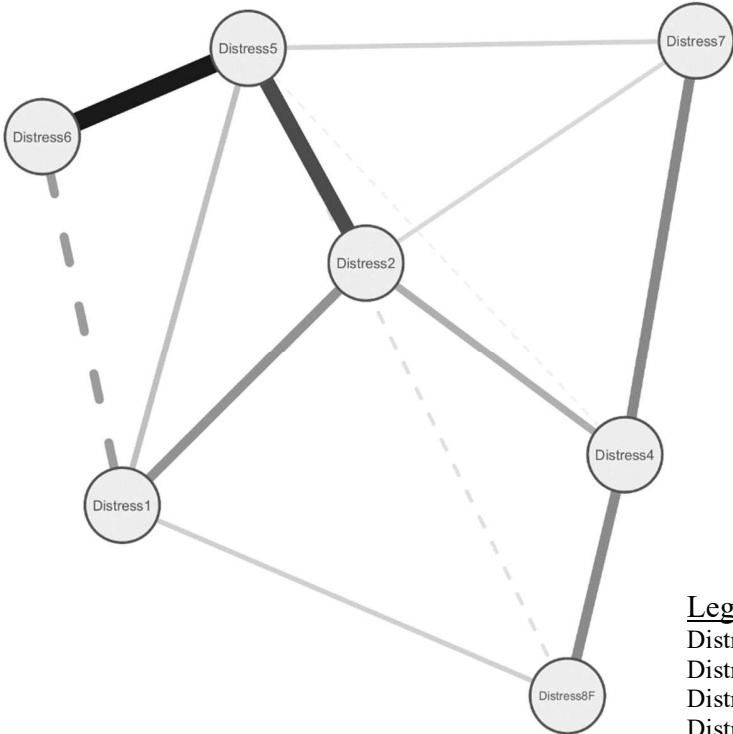


Legend:

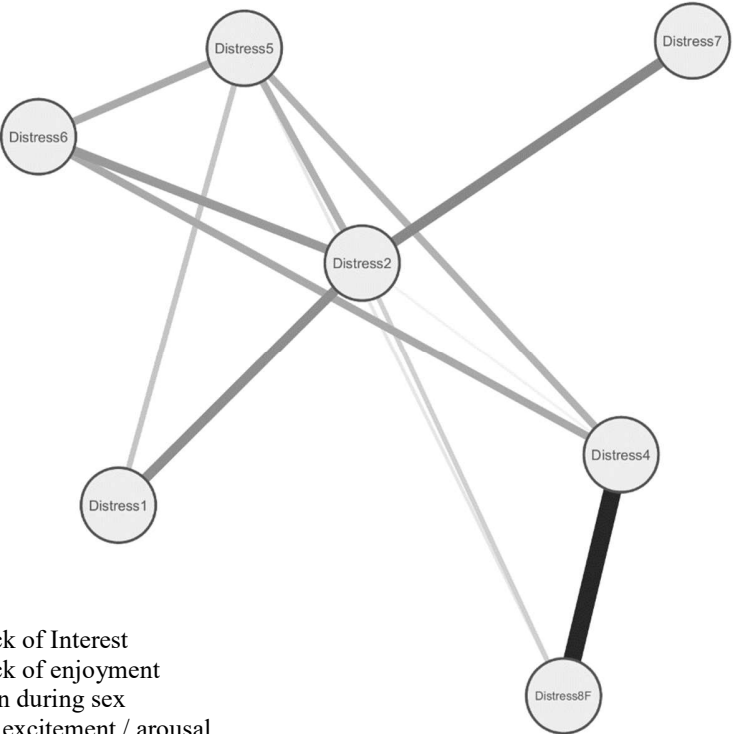
- Distress 1 = Lack of Interest
- Distress 2 = Lack of enjoyment
- Distress 4 = Pain during sex
- Distress 5 = No excitement / arousal
- Distress 6 = Orgasm problems
- Distress 7 = Rapid orgasm
- Distress 8M = Erectile problems
- Distress 8F = Vaginal dryness

Figure 3 - Female Sexual Distress Network by Emotional Intimacy Levels

Women – high intimacy



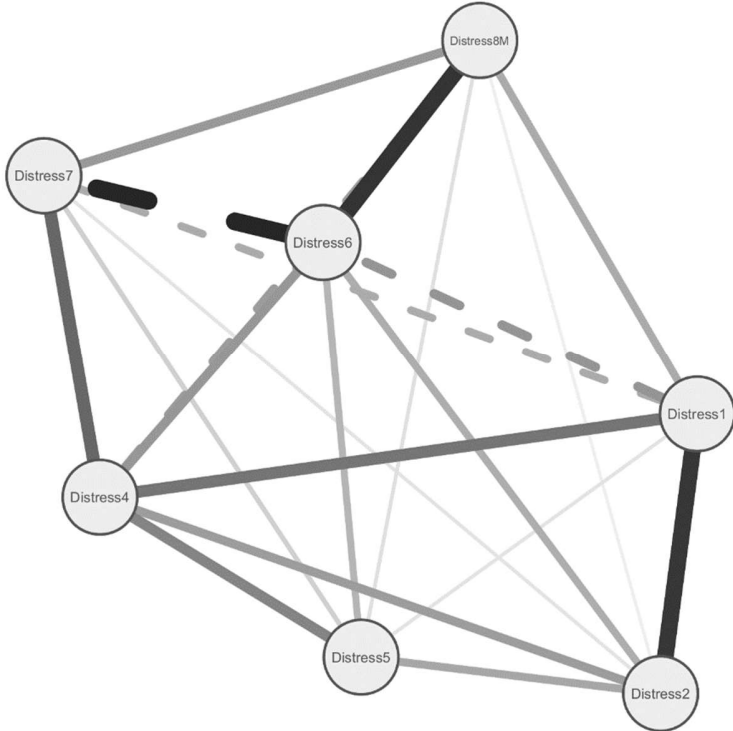
Women – low intimacy



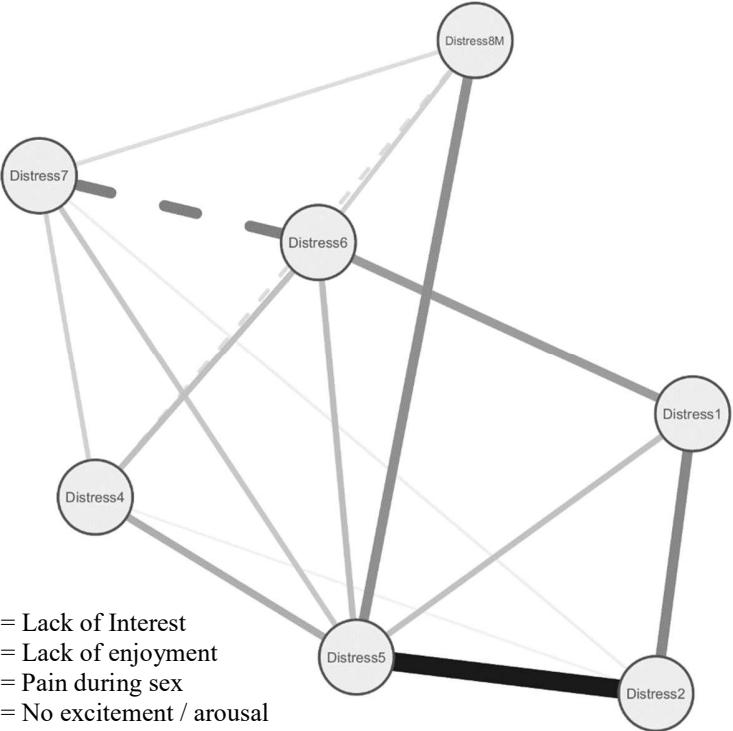
- Legend:**
 Distress 1 = Lack of Interest
 Distress 2 = Lack of enjoyment
 Distress 4 = Pain during sex
 Distress 5 = No excitement / arousal
 Distress 6 = Orgasm problems
 Distress 7 = Rapid orgasm
 Distress 8F = Vaginal dryness

Figure 4 - Male Sexual Distress Network by Emotional Intimacy Levels

Men - high intimacy



Men - low intimacy



- Legend:**
Distress 1 = Lack of Interest
Distress 2 = Lack of enjoyment
Distress 4 = Pain during sex
Distress 5 = No excitement / arousal
Distress 6 = Orgasm problems
Distress 7 = Rapid orgasm
Distress 8M = Erectile problems

Table 1 – Sexual difficulties and Distress in Older Women and Men Characterized by Low, Moderate, and High Relationship Intimacy

	Women				Men			
	Low	Moderate	High	Total	Low	Moderate	High	Total
	intimacy	intimacy	intimacy		intimacy	intimacy	intimacy	
	<i>n</i> (%) ^a	<i>n</i> (%) ^a	<i>n</i> (%) ^a	<i>N</i> (%)	<i>n</i> (%) ^a	<i>n</i> (%) ^a	<i>n</i> (%) ^a	<i>N</i> (%)
Lacked interest in having sex	115 (48.9)	88 (41.5)	41 (23.8)	244 (37.2)	59 (17.1)	53 (17.2)	29 (16.8)	141 (17.0)
Moderately or severely distressed about the above difficulty	21 (17.4)	18 (18.3)	11 (24.4)	50 (19.0)	24 (30.0)	13 (18.3)	7 (15.9)	43 (22.6)
Lacked enjoyment in sex	86 (39.8)	53 (26.4)	23 (14.1)	162 (24.7)	43 (13.0)	42 (13.8)	15 (9.1)	100 (12.5)
Moderately or severely distressed about the above difficulty	28 (30.1)	16 (23.9)	8 (26.6)	52 (27.4)	17 (26.6)	10 (15.7)	5 (17.8)	32 (20.5)
Felt physical pain as a result of sex	53 (24.1)	50 (24.3)	22 (13.5)	125 (21.2)	15 (4.5)	11 (3.6)	2 (1.2)	28 (3.5)
Moderately or severely distressed about the above difficulty	26 (35.6)	19 (29.3)	10 (34.5)	55 (33.0)	8 (20.0)	2 (5.8)	2 (10.5)	12 (12.7)
No excitement or arousal during sex	79 (36.7)	50 (25.4)	26 (17.1)	155	44 (13.4)	42 (13.9)	21 (12.7)	107

				(27.5)				(13.5)
Moderately or severely distressed about the above difficulty	26 (31.3)	12 (21.0)	6 (20.0)	43 (25.7)	18 (28.6)	9 (15.5)	4 (14.8)	31 (21.0)
Did not reach climax (or took a long time...)	121 (56.3)	98 (49.2)	56 (35.7)	275 (48.2)	124 (37.1)	113 (36.7)	55 (33.7)	292 (36.3)
Moderately or severely distressed about the above difficulty	28 (23.7)	22 (21.3)	8 (14.9)	56 (21.1)	27 (21.3)	32 (26.1)	12 (20.7)	71 (23.0)
Reached climax too quickly	17 (8.3)	17 (8.8)	19 (12.6)	53 (9.7)	130 (39.4)	121 (40.1)	49 (30.6)	300 (37.9)
Moderately or severely distressed about the above difficulty	4 (11.8)	2 (5.6)	2 (8.0)	8 (8.5)	27 (22.0)	21 (17.8)	11 (22.4)	59 (20.3)
Had an uncomfortably dry vagina	111 (49.3)	96 (46.4)	53 (31.5)	260 (43.3)	/	/	/	/
Moderately or severely distressed about the above difficulty	40 (39.2)	31 (33.3)	13 (24.5)	84 (33.9)	/	/	/	/
Had trouble getting or keeping an erection	/	/	/	/	189 (55.1)	166 (53.7)	71 (43.0)	426 (52.1)
Moderately or severely distressed about the above difficulty	/	/	/	/	83 (48.0)	72 (44.1)	27 (39.7)	182 (45.0)

Notes: ^aIn the case of sexual difficulties, percentages refer to the proportion of participants who reported a particular sexual difficulty by intimacy levels; in the case of sexual distress, percentages denote the proportion of individuals who reported “moderate or severe distress” out of the total number of participants with any sexual distress by intimacy levels