KAROLINSKA INSTITUTET
Department of Women and Children's Health
The Unit for Reproductive Health
Course: Master Thesis in Sexual, Reproductive and Perinatal Health, 15 hp.

Mothers have a higher orgasm satisfaction than non-mothers

-a quantitative cross-sectional study

Mödrar är mer tillfredsställda med sin orgasm än icke-mödrar

-en kvantitativ tvärsnittsstudie

Master thesis in sexual, reproductive and perinatal health, 15 hp.
(Advanced studies), 2019

Author:
Ebba Hasselqvist
Registered nurse
Midwifery student

Author:
Laura Stathakis
Registered nurse
Midwifery student

Supervisor:
Michael Benjamin Wells
PhD
PostDoc

Examiner:
Amani Eltayb
Med. vet
Dr. PhD Postdok

Karolinska Institutet

To our beloved families

The Gidlunds' and The Hasselqvists'

Thank you, from the deepest part of our hearts for your unconditional support and encouragement.

Doris, we will forever be thankful for giving us a sense of security and hope in the most difficult moments. Without your warmth we would have been lost. You are the most beautiful and cutest creature in the entire universe. Woff!

Alva, our dyscalculia was never a problem thanks to your high intelligence. We cannot thank you enough.

We love you to the end!

Elisia and Leonel, thanks for your honesty, cheerfully and loving support. You brought light into the dark and difficult moments during this process, as always! You are the sweetest!

Magnus, without your guidance we would be less confused, and done with this weeks ago. But we are grateful that you showed us how things should be done. Your choice of profession will always remain a mystery to us.

We love you, now and forever!

With lots of love

Ebba and Laura

To Michael Benjamin (Scott) Wells aka Nacho

Thanks for all your encouragement, all the time you spend on us, all the laughs and especially your patience

"with great power comes great…"

-Benjamin "Ben" Parker

-Hasselqvist & Stathakis

Prologue

Dear readers;

You are about to read a thesis written in 2019 by two midwifery students from Karolinska Institute in Stockholm. The thesis you are holding in your hand, or maybe reading on your computer, is about to introduce you to a new independent variable, orgasm satisfaction, and it was used to explore differences between mothers and non-mothers.

So, maybe, you wonder why we ended up investigating this? Well, since we are about to become midwives in Sweden, part of our responsibility coming with our title is to improve women's sexual health. During our education we've noticed most of the focus is on reproductive health, leaving sexual health aside. We really oppugn this, since midwives have reproductive and sexual health as specialization.

When reading previous studies, we found that midwifes in Sweden lack knowledge on sexual health and do not know how to address the topic sexuality. We also found that most research's about women's sexuality are about sexual satisfaction, which is a wide concept involving, love, intimacy, passion, and moreover, presence of others. Also, all of them reported mothers being less satisfied.

We also realized that women are always being presented as dependent individuals, even when talking about sex. Which led to us discussing the hypothesis of orgasm is something not being dependent on others but rather something with a high potential of being achieved independent from others. Could it be that sexual satisfaction and orgasm satisfaction differed? Could it be that maybe mothers were more satisfied with their orgasms even if they are not sexual satisfied?

This is how it all started, the rest is presented in the very thesis you are holding in your hands, or reading on your computer, right now! We invite you to read our work and hope you find it as interesting as we did!

Ebba Hasselqvist and Laura Stathakis

Abstract

Background: Previous studies have shown that non-mothers have a higher sexual satisfaction than mothers. While sexual satisfaction can be achieved without orgasming, orgasm satisfaction cannot be achieved without the ability to orgasm. Moreover, orgasm satisfaction, in contrast to sexual satisfaction, does not necessarily have to be dependent on others. It can be achieved in the absence of others. No previous study has explored orgasm satisfaction as an independent variable. In addition, it is not known whether non-mothers have higher orgasm satisfaction than mothers.

Aim: The aims of this study were to (1) expand the concept orgasm satisfaction to broaden the definition, create an independent variable and (2) assess if there are differences in orgasm satisfaction between mothers and non-mothers.

Method: A quantitative cross-sectional online survey was used to collect the data. A total of 2,135 women, with vulva and vagina, participated in the study. Independent sample t-test were used to compare the means of mothers and non-mothers in relation to their own orgasm satisfaction, sexual frequency, genital response, and sexual dysfunction. Multiple linear regression was then used to assess what factors influenced a woman's orgasm satisfaction. Compiled variables were created and tested with Cronbach's alpha and Spearman-Brown Formula.

Results: According to the independent sample t-test, mothers had less sexual frequency than non-mothers but had higher orgasm satisfaction and genital response than non-mothers. There were no differences between mothers and non-mothers on sexual dysfunction. Multiple linear regression showed that mothers still had higher orgasm satisfaction than non-mothers even after controlling for socio-demographic background factors, sexual frequency, and genital response.

Conclusion: Mothers' orgasm satisfaction as well as genital response during sexual activity is higher than non-mothers. Mothers are able to produce orgasms more easily and more intensely than non-mothers. Since this is the first study focusing on orgasm satisfaction, future research should aim to confirm the findings of this study to better understand the meaning of orgasm satisfaction.

Keywords: Orgasm, Sexual health, Orgasm satisfaction, Motherhood, Quantitative.

Sammanfattning

Bakgrund: Tidigare studier har visat att icke-mödrar har en högre sexuell tillfredsställelse än mödrar. Medan sexuell tillfredsställelse kan uppnås utan att få orgasm, kan orgasmtillfredsställelse inte uppnås utan förmågan att få orgasm. Dessutom behöver orgasmtillfredsställelse, i motsats till sexuell tillfredsställelse, inte nödvändigtvis vara beroende av andra. Det går att uppnå i frånvaro av andra. Ingen tidigare studie har undersökt orgasmtillfredsställelse som en oberoende variabel. Dessutom är det inte känt om icke-mödrar har högre orgasmtillfredsställelse än mödrar.

Syfte: Syftet med denna studie var att (1) utvidga begreppet orgasmtillfredsställelse genom att bredda definitionen, skapa en oberoende variabel och (2) bedöma om det finns skillnader i orgasmtillfredsställelse mellan mödrar och icke-mödrar.

Metod: En kvantitativ tvärsnittsundersökning utfördes för att samla in data. Totalt deltog 2,135 kvinnor, med vulva och vagina, i studien. Independent sample t-test användes för att jämföra medelvärden mellan mödrar och icke-mödrar i förhållande till deras orgasmtillfredsställelse, sexuell frekvens, genital respons och sexuell dysfunktion. Multipel linjär regression användes sedan för att bedöma vilka faktorer som påverkar kvinnans orgasmtillfredsställelse. Sammansatta variabler skapades och testades med Cronbachs alfa- och Spearman-Brown formeln.

Resultat: Enligt Independent sample t-test hade mödrar lägre sexuell frekvens än icke-mödrar men högre orgasmtillfredsställelse och genital respons än icke-mödrar. Det fanns inga skillnader mellan mödrar och icke-mödrar gällande sexuell dysfunktion. Multipel linjär regression visade att mödrar hade högre orgasmtillfredsställelse än icke-mödrar även efter att ha kontrollerat för sociodemografiska bakgrundsfaktorer, sexuell frekvens och genital respons.

Slutsats: Mödrars orgasmtillfredsställelse samt genital respons under sexuell aktivitet är högre än icke-mödrars. Mödrar har en förmåga att lättare producera orgasmer som dessutom är mer intensiva än icke-mödrars. Eftersom detta är den första studien som fokuserar på orgasmtillfredsställelse, bör framtida forskning sträva efter att bekräfta resultaten av denna studie för att på så vis bättre förstå betydelsen av orgasmtillfredsställelse.

Nyckelord: Orgasm, Sexuell hälsa, Orgasmtillfredsställelse, Moderskap, kvantitativ.

Karolinska Institutet

Table of Contents

Introduction

The right to sexual health is a fundamental human right (WHO, 2010a). Globally, different organizations, such as the World Health Organization (WHO) and the World Association for Sexual health (WAS), together with researchers from several parts of the world, collaborate and work with the aim of spreading knowledge about sexual health with the purpose of contributing to good sexual health for the entire international community (Hulter, 2017).

The WHO´s (2010b) defines sexual health as:

> ...a state of physical, emotional, mental and social well-being in relation to sexuality; it is not merely the absence of disease, dysfunction or infirmity. Sexual health requires a positive and respectful approach to sexuality and sexual relationships, as well as the possibility of having pleasurable and safe sexual experiences, free of coercion, discrimination and violence. For sexual health to be attained and maintained, the sexual rights of all persons must be respected, protected and fulfilled

Access to comprehensive information about sexuality, sexual activity, information and knowledge about the risks and how the environment affects a person's sexual life and how it can affirm and promote sexual health is needed to prevent sexual health problems (WHO, 2010b). To pursue a satisfying, safe and pleasurable sexual life is a human right (Glasier, Gülmezoglu, Schmid, Moreno Garcia, & Van Look, 2006). Using a public health perspective, a population with good health, including sexual health, is important for the social wellbeing and economic development of a country, as health related issues are expensive both in the short and long term (Folkhälsomyndigheten, 2018).

Sexuality

Women's sexuality has been the focus of studies, observations and discussions throughout history. Theories, based on both patriarchal and feminist approaches, have tried to explain the phenomenon (Forsberg, 2010; Johannisson, 2010; Larsson & Steiner, 2010; Lennerhed, 2010; Lewin, 2010). Women´s sexuality is hard to define (Bellamy, Gott, Hinchliff, & Nicolson, 2011) it includes biological, sociological, cultural and psychological aspects (WHO, 2010b).

The ability to feel desire is innate, but the ability to act on that desire is socially constructed and is influenced by societal norms (Lewin, 2010). Sexuality exists throughout the lives of all human beings, regardless of age, gender or sex (Helmius, 2010; Lindgren, 2010; Rosenqvist, 2010; Skoog, 2010; Tidefors, 2010). Sexuality is constant, but it changes over time and during different periods of life (Hulter, 2017; Mercer et al., 2013). It has different dimensions, among them, biological, genetic and hormonal aspects that are influenced by human´s different conditions throughout the lifespan (Hulter, 2017). According to the WHO (2010b), the definition of sexuality is:

> …a central aspect of being human throughout life encompasses sex, gender identities and roles, sexual orientation, eroticism, pleasure, intimacy and reproduction. Sexuality is experienced and expressed in thoughts, fantasies, desires, beliefs, attitudes, values, behaviours, practices, roles and relationships. While sexuality can include all of these dimensions, not all of them are always experienced or expressed. Sexuality is influenced by the interaction of biological, psychological, social, economic, political, cultural, legal, historical, religious and spiritual factors

A person's sexual instinct, also called libido, is the request and desire for physical contact between bodies. A person's libido persists throughout their lifetime, but changes strength with age, becoming weaker as people age (Borgfeldt, Åberg, Anderberg, & Andersson, 2010).

Women's sexuality can be expressed in a variety of ways: among them is the biological aspect that focuses on her reproductive behavior, genitals, and physical sexual response (Bellamy et al., 2011; WHO, 2010b). Sexuality can also be defined via her sexual orientation, as a perception from others were the female body is the external marker defining sexuality, as something emerging from physical contact with others, or as a mix of both physical and psychological aspects (Bellamy et al., 2011). Furthermore, there is a more abstract part of sexuality, which refers to sexuality in a social context. Expectations, emotional components, perceptions of one's own body and identity are part of this, and they vary over time and change depending on the social context, culture, they are being expressed in (Bellamy et al.,

2011; Pascoal Monteiro, De Santa Bárbara Narciso., Pereira Monteiro, 2013; Trice-Black, 2010).

However, women's sexuality is something that is not spoken openly about. It is a subject that is perceived as complicated to talk about even by health care providers (Eldridge & Giraldi, 2017; Fileborn, Lyons, Heywood, Hinchliff, Malta, Dow...Minichiello, 2017; Olsson, Robertsson, Falk, & Nissen, 2009; Wendt, Hildingh, Lidell, Westerståhl, Baigi, & Marklund, 2007). The consequence of having a lack of communication about sexuality is that it contributes to lower satisfaction when it comes to sexual-, relationship- and overall satisfaction therefore, openly discussing one's sexuality, especially with health care providers, may help increase a person's satisfaction (Montesi, Fauber, Gordon, & Heimberg, 2010).

Women's sexuality in a life cycle perspective

Even though it is individual, most women have their sexual peak in their early 30 (Schmitt, Shackelford, Duntley, Took, Buss, & Fisher, 2002). Sex life satisfaction in adulthood has been shown to be the same throughout life and is not dependent on age (Neto & da Conceição Pinto, 2013). However, young females, aged 18 to 24, have stated a need to hold back when becoming aroused because of concerns about their reputation, become involuntarily pregnant and insecurities about themselves (Graham, Sanders, Milhausen, & McBride, 2004).

According to the central bureau of statistics (Statistiska centralbyrån, n.d.) 82 percent of women in Sweden between 35 to 39 years old have children under 18 years of age. During the transition to motherhood, and especially during the first years after delivery, women experience a negative change, both in regard to the physical ability to experience sexual satisfaction and also their mental ability to feel satisfied with their own sexuality (Bellamy et al, 2011; Faisal-Cury, Rossi, Menezes, Quaile, & Matijasevich Grilo Diniz, 2015; Hansson & Ahlborg, 2015; McDonald, Woolhouse, & Brown, 2017; Montemurro & Siefken, 2012; Trice-Black, 2010; Woolhouse, McDonald, & Brown, 2012). For example, mothers of toddlers, between 2.5 to 3.5 years old, report a change in their relationship to sex and intimacy during pregnancy and after childbirth. Loss of libido, as a result of physical changes, such as gained weight, different body shape with flabby tummy, and breast shape, all contribute to a

feeling of being unattractive and is one of the reasons for their changing view on sex and intimacy (Woolhouse et al., 2012). Psychological changes such as exhaustion, changes in priorities, and a new experience of projecting love to their children instead of their partners, can also affect their sexual satisfaction. Also, psychosocial changes, as a result of having a different lifestyle, feeling a loss of freedom, and adjusting to their new role as a mother, can further impact on their sex life and intimacy (Woolhouse et al., 2012). Changes in maternal priorities often leads to mothers focusing more on their relationship with their children and the children's needs and less on their own (sexual) needs or their relationship with their partners, which can negatively affect their sexual life (Hansson & Ahlborg, 2015; Montemurro & Siefken, 2012; Trice-Black, 2010; Woolhouse et al., 2012). In addition, lack of intimacy, lack of sexual life, and lack of passion, are contributing factors to separations and divorces among parents of small children (Hanson & Ahlborg, 2015).

Women's self-image changes when becoming mothers. Physiological and psychological problems, such as mental illness, can also lead to declined sexual health, especially during the transition into motherhood (Faisal-Cury, Huang, Chang, & Rossi Menezes, 2013).

Midwives in Sweden

Midwives in Sweden work with sexual and reproductive health and have knowledge in gynecology and obstetrics. To be able to provide high quality care for individuals in different ages, and life situations, it is important that midwives understand, and have knowledge about both sexual, and reproductive health across the lifespan (Svenska Barnmorskeförbundet, 2018).

However, midwives focus, is often mainly on reproductive health, while neglecting people´s, especially women's, sexual health. A Swedish study showed that midwives did not often address sexuality during postnatal check-ups unless the women themselves addressed the subject through direct questions (Olsson, et al., 2009). Midwives report that they have a lack of knowledge regarding sexual health and do not know how to address the topic. In addition, they further stipulated that there is a lack of time, and that the healthcare systems organizational structures are further contributing barriers to them not being able to provide

quality sexual health care (Wendt, Lidell, Westerståhl, Marklund, & Hildingh, 2009; Olsson et al., 2009). Since having a sexual health problem negatively affect a person's overall health (WHO, 2010b), it can be cost-effective, especially from a societal perspective, to invest in education regarding support for women's sexual health, by increasing access to health and medical care within sexual and reproductive health. Educate health professionals in sexual health and integrate issues about sexual health into all important institutions of society, in order to positively improve welfare and social development, is recommended (Folkhälsomyndigheten, 2018).

Female sexual response

Basson developed a model for the female sexual response, which explains the response as a cycle (Basson, 2000; Basson, 2001), as opposed to Masters and Johnson's linear model, which focuses mainly on physical response during sexual stimuli (Nowosielski, Wróbel, & Kowalczyk, 2015). According to Basson, (Basson, 2000; Basson, 2001; Basson, 2011) sexual response is more than just the presence of orgasm. The model helps to explain that women can be satisfied with their sexuality even in the absence of orgasm (Trice-Black, 2010). Basson also pointed out the need of intimacy, knowledge that sexual response either can be responsive or spontaneous, and that women can have an orgasm either before or after arousal. Basson also explains that a woman can enter the cycle at several points, and that different factors can affect a woman's lust, such as her relationship, or her willingness and ability to participate in sex (Basson, 2000; Basson, 2001; Basson, 2011).

Female orgasm

The female orgasm consists of different physical responses. During sexual activity, the female genitals swell via an increased blood pressure, which changes the anatomy of the genitals. Females can experience two types of orgasms, depending on which part of the clitoris that are involved, the glans clitoris, or the roots of the clitoris (Buisson & Jannini, 2013). Secretion from the vagina is produced, and the walls in the vagina are exuding lubricant, which can feel like wetness in the vagina (Helström, 2009). However, when becoming aroused, females do not necessarily lubricate; therefore, arousal is not always correlated with genital response (Graham et al., 2004). The muscles contracts in the clitoris, vagina and uterus and can be

perceived as pulsations or throbbing for the woman (Komisaruk, Beyer-Flores, & Whipple, 2006). Masters and Johnson define orgasm intensity as how many contractions there are, where there are 3 to 5 for mild orgasm, and 10 to 15 for a more intense orgasm (Bohlen, Held, Olwen Sanderson, & Ahlgren, 1982).

The female sexual response can be explained as a cycle were the orgasm is the last phase (Helström, 2009). The female orgasm contains, the ejaculation and, rhythmic contractions in the muscles in the perineum, urethra and in the walls of the vagina. The orgasm also consists of an emotional experience and pleasure (Helström, 2009).

A woman can have an orgasm in different situations without having to include another person. An orgasm can be released as a result of masturbation, both direct manipulation, such as stimulation on the clitoris with for an example a finger or vibrator, or as an indirect manipulation, such as when masturbation does not include direct stimulation (Leff & Israel, 2013).

Female orgasm disorder, anorgasmia, is defined as "Persistent or recurrent delay in, or absence of, orgasm following a normal sexual excitement phase...The disturbance causes marked distress or interpersonal difficulty" (American Psychiatric Association, 2005, p.506) and is the second most frequently reported disorder among women. Despite this, there is no consensus on how to treat the disorder (Meston, Hull, Levin, & Sipski, 2004).

Genital response

Female sexual arousal differs from the males' arousal. Female arousal does not necessarily correlate with their corresponding sexual preference. Unlike males, who have a more categorical arousal pattern, women do not necessarily project their own sexual preference when getting aroused (Chivers, Rieger, Latty, & Bailey, 2004; Chivers & Bailey, 2005). Moreover, female arousal is influenced by general arousal rather than genital response. Physical, behavioral and, psychological factors are all part of female sexual arousal (Graham et al., 2004).

When sexually aroused, the bulbus vestibuli, the tissue around the urethra, glans clitoris, and the clitoral crura are swelling and tenting, to get an easier passage for sperm. Fluid can be secreted from the Bartholin's glands, which gives the woman a feeling of wetness in the vagina (Gambone, 2010).

Sexual satisfaction

Sexual satisfaction in women balances between the woman's own desire and the partners desire for her (Bellamy et al., 2011; Pascoal Monteiro et al., 2013; Trice-Black, 2010) Women do not need to have an orgasm to experience sexual satisfaction (Brattberg & Hulter, 2010; Trice-Black, 2010). In fact, even those having orgasms during sex are not always sexually satisfied (Brattberg & Hulter, 2010). Sexual satisfaction for heterosexual individuals is an emotional experience of frequent mutual sexual pleasure, which can be defined as, the presence of positive experiences rather than the absence of negative aspects (Pascoal Monteiro et al, 2013). Sexual satisfaction among mothers has also been shown to correlate with variables such as marital status, age, overall health, and support from their partner (McDonald et al., 2017). Neto and da Conceição Pinto, (2013) found that the strongest correlation for sexual satisfaction is satisfaction with love, regardless of age.

A sexual person

Perceiving oneself as a sexual person is an individual and subjective feeling that is dependent on the social context, and culture in which the woman lives (Bellamy el al 2011). Being a sexual person has been described as something the woman is in relation to others (Bellamy et al., 2011; Montemurro & Sfieken, 2012). The concept is defined based on both the self, and interaction with others. The female body is, on one hand, a visible, external marker of sexuality. The body cannot be separated from the socio- cultural context where it exists and serves as an important factor in the experience of being a sexual person (Bellamy et al., 2011). Feeling like a sexual person is not something static; it changes over time as a consequence of maturity, life situations, changes in life, and societal norms, and views of female sexuality (Bellamy et al., 2011; Montemurro & Sfieken, 2012; Trice-Black, 2010).

When women become mothers, many women experience that their sexuality changes, both objectively and subjectively. That is, physical changes often leave a feeling of, not being sexy anymore, not fitting into society's norms of how a female body should look like, or how a mother should express her sexuality (Bellamy et al., 2011; Montemurro & Sfieken, 2012; Trice-Black, 2010). Mothers may not express their sexuality as they did before becoming mothers, due to the preconception of the mother as a non-sexual person. Motherhood is not compatible with feeling sexy and sexuality (Montemurro & Sfieken, 2012).

Orgasm satisfaction

According to Basson, low sexual desire among women can be caused by an unsatisfying sexual relationship, and other sexual problems, such as, pain during sex, or the inability to orgasm (Basson, 2001; Basson, 2005). Women with difficulties of achieving the last phase of the female sexual response cycle, that is, orgasm, are more likely to experience psychological health problems, as anxiety or depression. They also may have difficulties experiencing arousal and have less positive body images than those not having difficulty to orgasm (Rowland, Cempel, & Tempel, 2018). While sexual satisfaction can be achieved without orgasming (Brattberg & Hulter, 2010 & Trice-Black, 2010), orgasm satisfaction cannot be achieved without the ability to orgasm.

Orgasm is as important for women as for men when achieving sexual satisfaction. In Britain, 43.3 percent of the women stated that sex with absence of orgasm was not satisfactory (Wellings, Field, Johnson, & Wadsworth, 1994, referred in Meston, Levin, Sipski, Hull, & Heiman, 2012). Orgasm satisfaction can be defined as; ease to orgasm, frequency of orgasm, and satisfaction with orgasm (Rosen, Brown, Heiman, Leiblum, Meston, Shabsigh, Ferguson, & D'Agostino, 2000). According to, Ortigue, Grafton and Bianchi-Demicheli (2007) women's orgasm is correlated with passion, love, and emotional closeness with partner. Women who are in love with their partner also have a higher facility to orgasm and are also more satisfied with their orgasm experiences. There is however, no correlation found between orgasm frequency, love and passion (Ortigue et al., 2007).

Research problem

Most studies on women's sexuality focuses on sexual frequency and/or sexual satisfaction. Moreover, when sexual satisfaction among women is discussed, it is often in relation to others. Orgasm satisfaction, in contrast to sexual satisfaction does not necessarily have to be dependent on others. It can be achieved in the absence of others. Previous studies show that women, when becoming mothers, are less satisfied with their sex life.

Orgasms are, even if not the most important, still an important factor of the female sexual response cycle. Orgasms consist of physical and psychological responses, and are an emotional, pleasurable experience. Difficulties to orgasm is the second most reported sexual dysfunction problem among women.

To our knowledge, no studies have explored a woman's orgasm satisfaction including the perceived feeling of being a sexual person, ease to orgasm during masturbation, ease to orgasm during sexual activity with others, satisfaction of sex life, and orgasm intensity. Previous studies analyzing orgasm satisfaction only focus on ease to experience orgasm, frequency and satisfaction with the experience. And, studies including orgasm in the concept sexual satisfaction, have not looked at orgasm satisfaction but only orgasm. Furthermore, the potential relation between orgasm satisfaction and maternity status has not been studied at all.

Orgasm satisfaction is not as broad as the concept sexual satisfaction. While sexual satisfaction can involve the experience of orgasm, it also includes other factors such as; love, passion, frequency of sexual activity, intimacy, desire, and pleasure. Satisfaction with the experience of orgasm can be affected by various factors, such as, marital status, age, sexual orientation, and education level.

Developing an orgasm satisfaction variable can also enable the possibility to study the concept independently and assess differences between women based on their maternity status to investigate if it is a potentially important construct affecting women's orgasm satisfaction and thus affecting their sexual life. The concept, orgasm satisfaction, can contribute to a better understanding on women's sexual- and overall health, since, not having high orgasm

satisfaction could lead to anxiety, arousal problems and distress and thus affect sexual health negatively.

Adapting the care given to women, taking into consideration factors affecting their sexual life, with the purpose of, achieving a good sexual health, is of great importance. This study is therefore needed, since the midwife's main responsibility is to improve and care for sexual and reproductive health. The study is also important for others than midwives, since women's sexual health affects all women.

Exploring the new concept, orgasm satisfaction, increases knowledge about differences between orgasm satisfaction and sexual satisfaction, and contributes on finding differences in sexuality between mothers and non-mothers. Which contributes to the midwife's ability of, through increased knowledge, improve and personalize the sexual health care for women.

Aim

The aims of this study were to (1) expand the concept orgasm satisfaction to broaden the definition, create an independent variable and (2) assess if there are differences in orgasm satisfaction between mothers and non-mothers.

Research question

Is it possible to expand the concept, orgasm satisfaction, by including other items and thus broaden the definition?

Orgasm satisfaction differs from sexual satisfaction. Previous studies have shown that mothers are more satisfied with their sex life, which leads to the questions presented below.

Does orgasm satisfaction differ when comparing mothers to non-mothers? Is orgasm satisfaction also, as sexual satisfaction, higher for non-mothers than mothers?

Hypothesis

It is possible to expand the concept of orgasm satisfaction by including other items and thus broaden the definition.

Orgasm satisfaction differs when comparing mothers to non-mothers. Non-mothers have, as well as sexual satisfaction, also a higher orgasm satisfaction than mothers.

Methods

Study design

The following study uses a cross-sectional design, as the data was collected at one point in time, January 2018, with the purpose of studying a phenomenon that was time-dependent, and also influenced by the social context in which it was expressed (Polit & Beck, 2017). In line with quantitative analytic techniques (Polit & Beck, 2017), two groups were compared (mothers and non-mothers), to see if there were statistical differences regarding their orgasm satisfaction, while controlling for confounding variables.

Pilot study

A pilot study is a small-scale study that can be used as an investigation of the methods to see if the study can be made on a larger scale. A pilot study makes it possible for the researcher to revise the study and to ensure the quality of the survey and provide an opportunity for revision (Polit & Beck, 2017). The survey used to collect data was first tested by Nordin and Hedlöf (2018) through a pilot study, which was sent out to five respondents for review, before it was finalized. The respondents had different demographics such as age, sexual orientation, marital status and level of education. Minor changes were then implemented, by Nordin and Hedlöf, to the survey before publicly posting the survey.

Data collection procedure

The data used in this study was obtained from a database created with the aim of investigate associations between genital response and satisfaction of sex life and if their was an interest for a word describing the female sensations of tumescence, by Nordin and Hedlöf (2018).

This database contains data from a total of 2,435 respondents. The data was collected through an anonymous online survey in 2018 between January 11th and February 1st, with a reminder to complete the survey being sent out on January 20th.

The anonymous online survey (Appendix 2) was published on social media platforms using a URL link. Four different coded links were used to collect the data. One link was posted on Nordin and Hedlöfs private Facebook pages, respectively, with a total of 900 followers. The followers were able to further share the link if they wanted. The second link was given to a representative from the organization Riksförbundet för sexuell upplysning (RFSU; The Swedish association for sexuality education), who posted the link on her private Facebook, Instagram, Twitter and a closed Facebook group with 4,600 members with female genitalia called Fittlife (Pussy Life). The third link was posted on a closed Facebook group called Honeys and the Bee´s with 136,000 female members. The last link was posted on the closed Facebook group Barnmorska-aktuellt och intressant (Midwife- current and interesting), a group consisting of 4,700 members who were either midwives or midwifery students (Nordin & Hedlöf, 2018).

The URL link to the anonymous survey posted on each of the social media platforms then led the respondents to an information letter about the authors and the study (Appendix 1). The respondents then read a consent form where ethical considerations were presented. Respondents were informed that by clicking to move forward on the survey, they were providing their informed consent. The respondents were anonymous when completing the survey (Nordin &Hedlöf, 2018).

Survey Design

The online survey consisted of 32 items divided into five categories: demographics, sexual activity, genital response, knowledge of genital sexual function and interest of a word for tumescent.

While some items had responses of Yes/No or free-text, where the respondent could write their beliefs, Likert scales were used in most items concerning sexual activity, genital response, knowledge of genital sexual function and interest of a word for tumescent.

Likert scales can be presented with numeric or text options, but the object is the same, to measure attitudes by letting the respondents rate a statement to measure the degree of agreement or disagreement with the item being examined (Polit & Beck, 2017). The items used to answer the current aim only consisted of click-item responses.

Inclusion and exclusion criteria

To answer the aim of the current thesis, different inclusion and exclusion criteria were employed. Inclusion criteria for the current thesis were respondents who identified themselves as females with female genitalia (e.g. vulva and vagina) and aged 20 years or older. The main reason for only including those with female genitalia was that our aim focuses only on this population, while the age limit excluded those under 20 years of age, as the data was not clear if the respondents were adults (e.g. 18 or 19 years old) or if they were younger than 18 years old. Exclusion criteria were if people reported themselves as transgender or had a neovagina. In addition, we further excluded any respondents who had missing data on the variables we assessed.

Definitions

Mothers

In the survey, participants were asked if they had ever given birth. If they answered yes, then they are referred to as mothers, while if they answered no, they are referred to as non-mothers.

Orgasm satisfaction

Orgasm satisfaction is defined based on the ease of orgasm, satisfaction with sex life, orgasm intensity and perceived feeling of being a sexual person.

Sexual frequency

Sexual frequency is defined based on frequency of masturbation, orgasm and sexual activity with others.

Genital response

Genital response is defined based on genital reaction during sexual activity including distinct reaction, Swelling, wetness, pulsation/throbbing and tingling/tickling.

Sexual dysfunction

Sexual dysfunction is defined based on whether the participants responded having some kind of diagnosis, medication intake or other factors affecting their sexual ability or ability to feel lust.

Participants

In total, 2435 people completed the current anonymous sex life survey. After employing the inclusion/exclusion criteria, the current study consisted of 2135 respondents, where 1335 respondents identified themselves as non-mothers and 800 as mothers. After excluding 40 women due to them never having orgasmed, the total number of respondents in the regression analysis were 2095 of which 1298 were non-mothers and 797 were mothers.

Measures

Data was collected on several socio-demographic background characteristics of the women including age, sexual orientation, education level, marital status and if the participant had ever experienced an orgasm. On items with nominal outcomes, frequencies and percent were calculated (Polit & Beck, 2017). This method also helps readers better understand the compiled data being presented (Polit & Beck, 2017; Sullivan & Artino, 2013).

Data was further collected on women's orgasm satisfaction, sexual frequency, genital response and sexual dysfunction.

Variables

The data included items with binary outcomes (Yes/No), as well as Likert scales, with different ranges depending on the item. Likert scales can be interpreted as either ordinal categorical scales or continuous numeric scales. If having a big sample size, over 5-10 observations from each group, and normal distribution of the data, it is recommended to treat ordinal data as continuous (Sullivan & Artino, 2013). Analyzing Likert-scale data using parametric tests, instead of non-parametric tests, minimizes the risk of bias even when the statistical assumptions are being violated because of the robustness of parametric tests (Norman, 2010; Sullivan & Artino, 2013). However, while measuring concepts through statistical tests is difficult but by grouping several Likert-scale items into a new variable, the complexity of a concept is more likely to be captured that way (Norman, 2010; Sullivan & Artino, 2013). When compiling several ordinal scale Likert items into a new variable, that new variable should be treated as continuous (Norman, 2010). In considering the internal consistency of the new multi-item variable, Cronbach's alpha, ranging from 0.70 to 0.95, have been reported (Tavakol & Dennick, 2011). If an alpha score is below 0.70 then the internal consistency may not be high.

To create the new variable, face validity was applied as a first step. Even though face validity is not a strong evidence ensuring validity of an instrument capability measuring what it intends, it is a way of doing a primary evaluation of it (Polit & Beck, 2017). Secondly, an evaluation of the items rating scale options was taken into account when compiling them into a new variable and covariates to enable the possibility to analyzing them with statistical test. To ensure internal validity the items included in the new compiled variable were analyzed using Cronbach's alpha and Spearman-Brown formula if needed to ensure internal consistency which increases the studies validity (Polit & Beck, 2017).

Orgasm satisfaction- a new variable

Orgasm satisfaction was used to measure how satisfied women were with their orgasms. Women reported their orgasm satisfaction by completing five questions: i) I consider myself a sexual person, ii) I orgasm easily when masturbating, iii) I orgasm easily when I have sex with one or more people, iv) I am satisfied with my sex life, and v) how intense do you

experience your typical orgasm? All five variables were based on a 7-point Likert scale ranging from 1 (Completely Disagree) to 7 (Completely Agree). The sum composite of these five items then created the scale orgasm satisfaction scale, where the theoretical range of scores was between 5 and 35. The variable was used as outcome measure.

Covariates

Beyond the socio-demographic background factors, three covariates were also used in the analysis: sexual frequency, genital response, and sexual dysfunction.

Socio-demographic background variables

These variables included the participants' age, sexual orientation, educational level, marital status, if they had ever orgasmed, and if they had given birth. For age, response options were in groups of five years (e.g. 20-24, 25-29), and remained this way until age 60, where the response was 60 or more. Sexual orientation asked if participants considered themselves to be heterosexual, homosexual, bisexual, asexual, none of the above, or does not want to disclose. Educational level involved three response options: less than a high school education, high school education, or at least some college/university education. Marital status involved four response options: single, steady partner(s), cohabiting, and marriage. Participants were asked if they had ever orgasmed or if they had ever give birth using a Yes/No response for both items. If they answered yes to given birth, then they were referred to as mothers, while if they answered no, they were referred to as non-mothers.

Sexual frequency

Sexual frequency was a compilation of three of the questions: How often do you masturbate? ii) How often do you have sex with one or more people? and iii) How often do you orgasm? Response options were based on a Likert ordinal scale from 1 to 6 where the options were: 1: At least once a day, 2: At least once a week, 3: 1-4 times per month, 4; Less than once a month, 5: At least once per year and 6: Never. The Cronbach's alpha for sexual frequency was 0.52.

Genital response

Genital response was a compilation of six questions: i) Distinct reaction in my genitalia during sexual activity, ii) Swelling in my genitalia during sexual activity, iii) Intensely getting wet during sexual activity, iv) Intensely swelling in genitalia during sexual activity, v) Intensely pulsation/throbbing during sexual activity, and vi) Intensely tingling/tickling during sexual activity, from the survey, addressing genital response during sexual activity. Response options were based on a Likert ordinal scale from 1 (Not correct at all) to 7 (Completely correct). However, bivariate correlation analysis showed that Swelling in my genitalia during sexual activity was highly correlated with "Intense swelling" (correlation=0.77; $p<0.001$); Swelling in my genitalia during sexual activity, was removed from the genital response compilation, leaving five variables included in this covariate variable. The Cronbach's alpha for the five-item genital response variable was 0.76.

Sexual dysfunction

Sexual dysfunction was a compilation of three questions that were on a dichotomous nominal scale: i) Are you currently diagnose with any disease that affects your sexual ability or lust? ii) Do you currently medicate with any drugs that affect your sexual ability or lust, e.g. antidepressants or blood pressure medication, iii) Sexual dysfunction may be caused by an illness or drug usage but may also occur from other non-diagnosed causes. Do you have any current sexual dysfunction that affects your sexual ability or lust? The response options for these items were Yes or No. The Cronbach's alpha for sexual dysfunction was 0.53.

Bias

Bias refers to the potential impact on the outcome by influencing the data in an inaccurate way, which is not ethically correct when it comes to research. Researchers may therefore report the steps taken in the process aiming to reduce the risk of bias in the study (Polit & Beck, 2017).

Since the data was collected anonymously, the researchers did not have access to the respondent´s identification. This reduces the risk of subjectivity bias when handling the data. Another factor contributing to minimizing the risk of bias was that the online survey consisted of mostly questions with click options, which minimized the risk of misinterpretation from the

researchers. By applying the exclusion criteria on the collected data, the risk of the study results not reflecting what it intended to study was minimized; that is the validity and reliability were increased (Polit & Beck, 2017).

A potential risk of bias was detected when defining the concept "mothers" as a woman who have given birth. While women can be mothers even if they have not given birth, in this research, women are only defined as mothers if they have given birth. In addition, since there was no question regarding if a woman was a mother who had not given birth, there was no way to categorize these women as mothers.

To gain internal validity, which refers to minimizing confounders affecting the outcome, data was checked using various statistical analyses (Polit & Beck, 2017). Furthermore, Cronbach's alpha was calculated for each of the composite variables. By reporting the results from these tests, the study´s transparency, which results in higher validity of the study, is increased.

Statistical analyses

All analyses were completed using SPSS version 24. This program was provided for students at Karolinska Institute for nursing- and medical research.

Descriptive statistics

The data was first analyzed using descriptive statistics. Using descriptive statistics helped summarize the quantitative data (Polit & Beck, 2017). Frequencies and percent were reported.

Independent sample T-test

Independent sample t-tests were applied since the variables were on continuous scale and independent from each other. An independent sample t- test is a parametric statistical analytical test that is used to compare means of two independent groups in order to assess if they are statistically significant different (Polit & Beck, 2017). The dependent variables orgasm satisfaction, sexual frequency, genital response and sexual dysfunction. The independent variable was *have you ever given birth*, which is interpreted as motherhood in the current study.

Multiple linear regression

Regression analyzes if the statistically significant differences between the two groups being examined were affected by other factors, such as confounders, or if they were also explained by the independent variable, in this case being a mother or not (Polit & Beck, 2017). Multiple linear regression estimates outcomes via a dependent continuous variable after controlling for more than two independent factors. The multiple regression model analyzes correlations in a more complex way than simple linear regression, as it controls for confounders that can affect the outcome and analyzes the degree in which the controlling factors, known as covariates, can explain the measured outcome. Therefore, a multiple linear regression was considered an appropriate analysis for the current research question (Polit & Beck, 2017).

A simultaneous multiple regression was applied since nothing indicated a hierarchical range between the covariates which otherwise would, according to Polit and Beck (2017), speak for instead having done either a hierarchical multiple regression or possibly a stepwise multiple regression. All the covariates were entered into the regression at the same time.

Adjusted R-square was calculated. While R-square only explains how much of the variance in the dependent variable is explained by the model, adjusted R-square also takes into account, and penalizes, for the number of variables in the model (Polit & Beck, 2017). Adjusted R-square was therefore calculated, to control for the strength of the relationship between the dependent variable, orgasm satisfaction, the covariates and the outcome measure. A high score is desirable since it indicates how much of the variance in the dependent variable is explained by the model (Polit & Beck, 2017). The standard error score was also reported, to increase reliability and enable an assessment of the validity of the study. "The standard error of estimate is a measure of the accuracy of predictions that we do not describe further, except to note that smaller values are preferred to larger ones" (Polit & Beck, 2017, suppl. 18 p.1).

The regression coefficient, presented as the unstandardized beta, predicts the effect from the independent variable on the dependent variable when there is a unit change in the scale of the independent variable on a positive direction and other covariates are held constant, meaning they do not change (Polit & Beck, 2017).

The calculated statistical significance was always presented as a difference compared to the reference group. In current analysis, dummy variables were constructed, with the reference groups being: was non- mothers, 20 to 24 years old, heterosexual, with an education level from elementary school and single. The significance test used in this analysis was the one called test of the regression coefficients, which calculates the probability value by dividing the regression coefficient by the standard error (Polit & Beck, 2017).

Sensitive analysis

A sensitive analysis is recommended to assess differences in results when there is missing data potentially having an impact on the outcome. This method of analysis aims to assess the sensitiveness of the result when changes in assumptions are applied, for example by truncating the data (Polit & Beck, 2017). A sensitive analysis was applied after truncating the data to only include women aged between 20-44. Women this age have a higher probability of having small children or children living at home (Statistiska centralbyrån, 2011:3) which potentially risks having a negative impact on orgasm satisfaction.

Ethics

The core of ethical codes is based on moral principles; Respect for autonomy, Nonmaleficence, Beneficence and Justice (Beauchamp & Childress, 2009).

Respect for autonomy refers to the individual's right to act based on their own beliefs and values, meaning that researchers must respect and make sure that the participants are being respected and allowed to make decisions of their own as long as no harm is done against others. To do so, the researcher must be open with all the information required for the participants ability to take a decision about their participation. The individual’s choice to voluntarily be part of a study is an important requirement. Decision making should always be based on informed consent, meaning that predetermined conditions should be presented to the participant prior to their decision to participate or not in the research (Beauchamp & Childress, 2009). The current study fulfilled all of the requirements regarding the ethical principle of autonomy.

The ethical principle of not harming, also called, nonmaleficence, is based on the obligation of not harming or doing wrong to others in any way, regardless of whether it is, intentional or unintentional. This means that the researchers must take into consideration the potentialrisk of doing wrong or harming and avoid the risks of causing pain or suffering, or offense (Beauchamp & Childress, 2009). In the current study the data was collected and treated with respect for the individuals, taking into account the sensitive characteristics of the subject. To reduce the risk of potentially harm, offend and cause pain the data was analyzed accuracy and in in line with recommended and reliable data analysis methods to reduce the risk of a inaccurate outcome potentially causing harm.

The ethical principle of beneficence is closely related to the principle of nonmaleficence but is based on the belief of always doing good. The principle can be described in two different ways. One is to provide good to others and the other is to balance between risks and costs with the aim of providing the most beneficial outcome (Beauchamp & Childress, 2009). The currents study was conducted to increase knowledge on women's sexuality to improve sexual health.

The fourth principle is about fairness, that is, justice. Here the core is the concept of equality. Fairness is based on equal right regardless of individual characteristics, such as, gender, ethnical, age, socio-economics and disabilities (Beauchamp & Childress, 2009). The Swedish law on Health and Medical Services act is a good example on how this ethical principle forms part of the healthcare system, stating that the right for equal care for the entire population with respect for equal value, the individual's dignity and by prioritizing the care given to those in greater need (*Hälso- och sjukvårdslag* [HSL], SFS 2017:30). In the current study this principle was fulfilled by the surveys design, allowing those interested in participation in the study to do so regardless individual characteristics besides not being a woman, since the aim was to explore female sexuality. All women regardless sexual orientation, marital status, age, and level of education were able to participate.

The Swedish Science Council has stated four main requirements when conducting research within humanities and social science. The information requirement, the consent requirement,

the confidentiality requirement and the requirement for use. These are all based on the previous presented ethical codes and intends to assure the participants right to autonomy, fair treatment without harming and with the aim of doing good. The council states different requirements that must be met when conducting a study, among them the obligation to provide potential participants a letter of consent, a letter of information and make choices that reduce the risk of violating ethical principles (Vetenskapsrådet, 2002). This was done in the current study.

According to Swedish law (*Lag om etikprövning av forskning som avser människor*, SFS 2003:460) ethical approval was not mandatory for a study made on this academic level. However, since the survey contains potentially sensitive information, codes of ethics were taken into consideration when collecting and analyzing data. In addition, the respondents have the right to be protected from exploitations and be ensured that their participation will not be used against them (Polit & Beck, 2017). Therefore, all respondents were greeted with an information letter and consent form when they clicked on the posted URL link (appendix 1). In addition, the survey was completely anonymously, and therefore, no personal information was collected, making it impossible to identify the respondents (Nordin & Hedlöf, 2018; Polit & Beck, 2017). The researchers also have the permission to use the data from the main author, Nordin, and their main supervisor, Wells.

Results

As outlined in Table 1, women were aged between 20 and 60 or more, 30 percent were aged between 25 to 29, which was the age group with most participants. The groups had a non-equal variance when looking at age and marital status. The non-mother group was younger and had less variance on age, with most participants being between 20 to 34 years old, compared to mothers, whose age variance was more distributed amongst the age group.

Heterosexual was the most sexual orientation, with 72 percent. The majority (82.8 percent) had a college/university education level and 75 percent of the total were in some kind of relationship, while 25 percent were single. Almost everyone (98.1 percent) had experienced an orgasm, leaving only 1.9 percent (n= 40) with no experiences of an orgasm.

When looking at marital status the variance was also not equal distributed within and between the groups, 46.3 percent of the mothers were married, and 32.1 percent of the non-mothers were single.

Analysis of the socio-demographics for the participants showed that the variance between the two groups differed in the factors; age and marital status (Table 1). To ensure homogeneity Levene´s test was applied when comparing the groups prior to the independent sample t-test. Levene´s test shows if the variance is unequal between groups by testing the hypothesis that the groups are equal (Polit & Beck, 2017).

Table 1: Socio-demographic factors

Descriptive socio-demographic background factors
for the Total sample, Non-mothers and mothers, reported via frequencies (and percent)

	Total sample (2135) N (%)	**Non-mothers (1335) N (%)**	**Mothers (800) N (%)**
Age			
20-24	418 (19.6)	407 (30.5)	11 (1.4)
25-29	636 (29.8)	540 (40.4)	96 (12.0)
30-34	410 (19.2)	251 (18.8)	159 (19.9)
35-39	267 (12-5)	76 (5.7)	191 (23.9)
40-44	170 (8.0)	31 (2.3)	139 (17.4)
45-49	99 (4.6)	17 (1.3)	82 (10.3)
50-54	59 (2.8)	9 (0.7)	50 (6.3)
55-59	37 (1.7)	3 (0.2)	34 (4.3)
60 or more	39 (1.8)	1 (0.1)	38 (4.8)
Sexual orientation			
Heterosexual	1537 (72.0)	911 (68.2)	626 (78.3)
Homosexual	76 (3.6)	52 (3.9)	24 (3.0)
Bisexual	466 (21.8)	326 (24.4)	140 (17.5)
Asexual	7 (0.3)	7 (0.5)	0 (0)
None of the above	34 (1.6)	26 (1.9)	8 (1.0)
Does not want to disclose	15 (0.7)	13 (1.4)	2 (0.3)
Education level			
Elementary School	19 (0.9)	9 (0.7)	10 (1.3)
High School	349 (16.3)	247 (18.5)	102 (12.8)
College/ University	1767 (82.8)	1079 (80.8)	688 (86.0)
Marital status			
Single	534 (25.0)	428 (32.1)	106 (13.3)
Steady partner (s)	486 (22.8)	401 (30.0)	85 (10.6)
Cohabiting/ Civil partnership	675 (31.6)	436 (32.7)	239 (29.9)
Married	440 (20.6)	70 (5.2)	370 (46.3)
Have you ever experienced an orgasm?			
No	40 (1.9)	37 (2.8)	3 (0.4)
Yes	2095 (98.1)	1298 (97.2)	797 (99.6)

Compiled variables

The means and standard deviations of the individual items within the newly created constructs, including orgasm satisfaction, sexual frequency, etc. are reported in Tables 2 to 5. These descriptive tables were completed to better understand, at the individual item level, how the item means might impact the overall construct variable.

Orgasm satisfaction

On orgasm satisfaction, mothers had higher mean than non-mothers on the three items directly related to orgasms, while on the two overall sex questions, both groups had similar average scores.

Table 2. Orgasm satisfaction
Items with their mean and standard deviation.

	Total sample M (SD)	**Non-mothers M (SD)**	**Mothers M (SD)**
I orgasm easily when I masturbate?	5.58 (1.62)	5.78 (1.66)	5.97(1.55)
I orgasm easily when I have sex with one or more people?	4.36 (1.95)	4.07 (1.94)	4.85(1.86)
How intense do you experience your typical orgasm?	5.25 (1.22)	5.09 (1.25)	5.52(1.12)
I consider myself a sexual person	5.38 (1.5)	5.39 (1.49)	5.36(1.56)
I´m satisfied with my sex life	4.37 (1.8)	4.37 (1.77)	4.37 (1.9)

Sexual frequency

On sexual frequency, non-mothers had higher mean than mothers on all the three items.

Table 3; Sexual frequency
Items with their means and standard deviation

	Total sample M (SD)	Non-mothers M (SD)	Mothers M (SD)
How often do you masturbate?	4.10 (1.06)	4.25 (1.00)	3.85 (1.10)
How often do you have sex with one or more people?	3.92 (1.1)	3.99 (1.09)	3.81 (1.11)
How often do you orgasm?	4.36 (.91) *	4.42 (.96)*	4.27 (.83)

** 1 missing case = sample 2134*

Genital response

On genital response, mothers had higher mean than non-mothers on four out of five items, with the fifth item having a similar average score.

Table 4; Genital response
Items with their means and standard deviation

	Total sample M (SD)	Non-mothers M (SD)	Mothers M (SD)
Distinct genital reaction in my genitals during sexual activity	5.93 (1.32)	5.87 (1.33)	6.02 (1.31)
Intensely getting wet during sexual activity	5.52 (1.33)	5.54 (1.33)	5.50 (1.34)
Intense swelling in genitals during sexual activity	4.87 (1.49)	4.79 (1.50)	5.01 (1.47)
Intensely pulsating/throbbing during sexual activity	4.53 (1.67)	4.45 (1.65)	4.67 (1.69)
Intensely tingling/tickling genitals during sexual activity	5.05 (1.73)	4.99 (1.71)	5.14 (1.75)

For sexual dysfunction, the frequencies are similar on all three items for both groups.

Table 5; Sexual dysfunction
Items with their means and standard deviation.

	Total sample N (%)	Non-mothers N (%)	Mothers N (%)
Dysfunction due to a disease			
No	1889 (88.5)	1172 (87.8)	717 (89.6)
Yes	246 (11.5)	163 (12.2)	83 (10.04)
Dysfunction due to Medication			
No	1753 (82.1)	1094 (81.9)	659 (82.4)
Yes	382 (17.9)	241 (18.1)	141 (17.6)
Dysfunction due to Other			
No	1769 (82.9)	1096 (82.1)	673 (84.1)
Yes	366 (17.1)	239 (17.9)	127 (15.9)

Differences between mothers and non-mothers

Since the variance differed between the groups on age and marital status, Levene's test was applied. Significance 2-tailed test showed that there still was a statistical difference between the groups even after controlling for inequality in variance.

As shown in table 6, the independent sample t-tests demonstrates that mothers had higher orgasm satisfaction and genital responses, but lower sexual frequency responses than non-mothers. There were no statistically significant differences between mothers and non-mothers regarding sexual dysfunction, as was expected from the individual item descriptive tables. The two composite variables consisting of five items each, orgasm satisfaction and genital response, had adequate to good internal consistency, while sexual frequency and sexual dysfunction, which consisted of three items each, had lower internal consistencies. The independent t-tests showed a high statistically significant difference between the two groups being compared indicating that mothers had a higher orgasm satisfaction (Table 6). There was

no statistical difference between the two groups when analyzing the variable sexual dysfunction (Table 6). The independent sample t-test showed a statistically significance difference between the groups indicating that mothers had a stronger genital response during sexual activity with other people than non-mothers (Table 6). It also revealed a high statistical significance when comparing the two groups, showing that non-mothers had more frequent sex (Table 6).

Table 6: Orgasm satisfaction, Genital response and sexual dysfunction
for the total sample, non-mothers, and mothers, with independent sample t-tests and 95% confidence intervals comparing non-mothers and mothers. Cronbach's alpha is reported for each scale.

	Total Sample M (SD)	**Non-mothers M (SD)**	**Mothers M (SD)**	**t**	**95% CI**	**Cronbach's Alpha**
Orgasm Satisfaction	25.21 (5.50)	24.70 (5.53)	26.06 (5.35)	5.58***	0.89 to 1.84	0.69
Sexual Frequency	12.39 (2.21)	12.67 (2.14)	11.92 (2.25)	-7.70***	-0.94 to -0.56	0.52
Genital response	25.90 (5.56)	25.63 (5.46)	26.34 (5.70)	2.86**	0.22 to 1.20	0.76
Sexual dysfunction	0.47 (0.78)	0.48 (0.79)	0.44 (0.75)	-1.25	-0.11 to 0.02	0.53

**p > 0.05, **p > 0.01, ***p > 0.001*

Excluding those with no experience of orgasm

The respondents who had never experience an orgasm were excluded in subsequent analyses, since these respondents would not have an orgasm satisfaction score. Therefore, 40 respondents, of which 3 were mothers and 37 were non-mothers were excluded in the linear regression analyses. Of those who were excluded due to never having orgasmed, most of the non-mothers were 20 to 29 years old, while all the mothers were 30 to 44 years old. Most were heterosexual with either high school or college education. Most non-mothers were single while all the mothers were in a relationship.

Multiple linear regression

A multiple linear regression analysis was used to examine if there were differences in orgasm satisfaction between the groups after controlling for the following confounding variables: age,

sexual orientation, education, marital status, sexual frequency and genital response. The results showed that mothers still had a greater statistically significant orgasm satisfaction than non-mothers (Table 7). Since sexual dysfunction was not significantly different in the independent sample t-test, this variable was subsequently excluded from further analyses.

Table 7: Linear regression
of orgasm satisfaction, after controlling for various socio-demographic background factors, sexual frequency and genital response

	B	CI 95%
Given birth		
Non-mother	Ref	
Mother	0.51	0.04 to 0.97*
Age		
20-24	Ref	
25-29	0.71	0.21 to 1.21**
30-34	1.09	0.51 to 1.67***
35-39	1.36	0.66 to 2.06***
40-44	1.07	0.26 to 1.88**
45-49	1.84	0.90 to 2.79***
50-54	2.55	1.40 to 3.70***
55-59	1.57	0.18 to 2.96*
60+	2.98	1.61 to 4.35***
Sexual orientation		
Heterosexual	Ref	
Homosexual	0.12	-0.79 to 1.03
Bisexual	-0.13	-0.54 to 0.28
Asexual	-3.21	-6.65 to 0.22
None of the above	-0.57	-1.90 to 0.76
Does not want to disclose	-1.61	-3.60 to 0.38
Education		
Elementary	Ref	
High School	0.34	-1.46 to 2.14
College/University	1.43	-0.33 to 3.19
Marital status		
Single	Ref	
In relationship	1.46	1.06 to 1.87***
Sexual frequency	0.86	0.78 to 0.95***
Genital response	0.42	0.39 to 0.45***

**p > 0.05, **p > 0.01, ***p > 0.001*

Furthermore, the multiple linear regression analyses showed that older age groups and those in a relationship had a greater orgasm satisfaction than those aged 20 to 24 years or single women, respectively. The regression analyses further indicated that those with more sexual

frequency and those with higher genital response also had higher orgasm satisfaction (Table 7).

Summary of the model

The variables included in the model were, socio-demographics, sexual frequency and genital response, as seen on Table 7. The score for R-square was 43.9 percent while the Adjusted R-square was 43.4 percent. Standard error of estimate was 3.84, and the constant score 0.63.

Sensitive analysis

The sensitive analysis revealed that there was still a statistical significant difference between mothers and non-mothers in orgasm satisfaction, even after truncating the data to only include women aged 20-44. The results from this analysis were very similar to the one including the total sample, Table 7.

Table 8: sensitive analysis

	B	**CI 95%**
Given birth		
Non-mother	Ref	
Mother	0.54	0.06 to 1.02*
Age		
20-24	Ref	
25-29	0.68	0.18 to 1.18**
30-34	1.05	0.47 to 1.63***
35-39	1.28	0.58 to 1.99***
40-44	0.98	0.17 to 1.79*
Sexual orientation		
Heterosexual	Ref	
Homosexual	0.31	-0.68 to 1.31
Bisexual	-0.12	-0.54 to 0.29
Asexual	-3.22	-6.62 to 0.18
None of the above	-0.93	-.3.30 to 0.45
Does not want to disclose	-1.85	-3.89 to 0.18
Education		
Elementary	Ref	
High School	0.16	-1.72 to 2.04
College/University	1.28	-0.55 to 3.13
Marital status		
Single	Ref	
In relationship	1.58	1.15 to 2.08***

Sexual frequency	0.85	0.75 to 0.94***
Genital response	0.41	0.38 to 0.45***

**p > 0.05, **p > 0.01, ***p > 0.001*

Discussion

Result discussion

The current study assessed an anonymous online survey of women's orgasm satisfaction based on their motherhood status. While independent t-tests on 2135 women showed that mothers have less frequent sex than non-mothers, they have a higher orgasm satisfaction and genital response than non-mothers. However, no differences were found between mothers and non-mothers regarding having a sexual dysfunction. After running a multiple linear regression, we found that mothers still had a higher orgasm satisfaction than non-mothers, even after controlling for several socio-demographic background factors, as well as sexual frequency and genital response.

The model had an adjusted R-square score of 43.4 percent, it is thereby explaining much of the variance with the variables in the regression model. This means that over 40 percent of the factors having an impact on orgasm satisfaction are captured. This is not the highest score, a study conducted by Philippsohn and Hartman (2009), aiming to differentiate between satisfaction with sex life in general and sexual satisfaction from sexual intercourse, petting, or masturbation, created models with an adjusted R-square scoring from 58-68 percent. However, sexual satisfaction has been explored in various studies (Bellamy et al., 2011; Brattberg & Hulter, 2010; McDonald et al., 2017; Neto and da Conceição Pinto, 2013; Pascoal Monteiro et al., 2013; Trice-Black, 2010) which provides the researchers with more information about factors having an impact, and being related to the concept being explored, sexual satisfaction. Most of the variance with the variables in our regression analysis is not explained by the model. However, exploring a potential sensitive topic, as orgasm satisfaction, and, moreover, exploring this for the first time, capturing over 40 percent of the variance with the variables in the regression model can be claimed to be a satisfactory score.

While other studies have shown that mothers are less satisfied with their sex life and sexuality, none of them have explored the concept orgasm satisfaction (Bellamy et al., 2011;

Faisal-Cury et al., 2015; Hansson & Ahlborg, 2015; McDonald et al., 2017; Montemurro & Siefken, 2012; Trice-Black, 2010; Woolhouse et al., 2012). It has been suggested that sexual satisfaction is correlated with satisfaction with orgasm, as the higher frequency of orgasm during sexual activity, the more satisfied women were with their sexuality (Young, Denny, Young, & Luquis, 2000). However, other studies have concluded that orgasm does not necessarily correlate with being satisfied with one's sexual life (Brattberg & Hulter, 2010; Trice-Black, 2010) but rather correlates with marital status, age, overall health and support from partner (McDonald et al., 2017). A study analyzing sexual satisfaction within the context of marriage showed that even though orgasm frequency played a role in perceived sexual satisfaction, it was also influenced by other factors, such as, age, relationship quality, overall satisfaction and self-spouse orgasm (Young et al., 2000). Our findings also showed a correlation between orgasm satisfaction and sexual frequency. However, the findings also revealed that orgasm satisfaction is still, even after controlling for sexual frequency, which itself includes orgasm frequency, higher for mothers than non-mothers, although mothers do not have a higher sexual frequency.

Orgasm satisfaction differs from sexual satisfaction. Sexual satisfaction is often defined by factors such as sexual frequency, sexual activity, love, passion, intimacy, desire and pleasure (Bellamy et al., 2011; Brattberg & Hulter, 2010; Faisal-Cury et al., 2015; Hansson & Ahlborg, 2015; McDonald et al., 2012; Montemurro & Siefken, 2012; Pascoal Monteiro et al., 2013; Trice-Black, 2010). The studies exploring sexual satisfaction are often limited to heterosexual intercourse, frequent mutual sexual pleasure, relationship satisfaction and love (Bellamy et al., 2011; Pascoal Monteiro et al., 2013; Trice-Black, 2010). Our definition of orgasm satisfaction was not considering relationship elements but rather factors where the individual does not have to be dependent on others to be able to experience satisfaction; meaning that women do not have to be in a relationship to be satisfied and even if they are they can influence their perceived satisfaction by they own. Moreover, orgasm satisfaction focuses on the ease and intensity of the orgasm, rather than the love or pleasure derived from sexual activity. Therefore, while the current study did not assess if mothers were happier with their sex life, results show that they are able to have orgasms more easily and intensely than non-mothers.

Studies have shown that age does not have an impact on sexual satisfaction (Montesi et al., 2010; Neto & da Conceição Pinto, 2013). However, Neto and da Conceição Pinto (2013) found that there was a difference between age groups on expectations and requirements to achieve sexual satisfaction, showing that the younger the more requirements there are. Our findings also showed that when controlling for age it was revealed that age played an important part on orgasm satisfaction. For example, age might be an important factor in orgasm satisfaction, because compared to 20 to 24 year old's, older women may understand their body more and know how to give themselves or direct others to make them orgasm more easily and/or more intensely. It has been found that women in long lasting relationships were more open about sex communication, which had a positive impact on sexual satisfaction (Montesi et al., 2010) this may potentially spill over and also be valid for orgasm satisfaction. It has been pointed out that being in a relationship has a negative impact on sexual satisfaction, showing that women with partners scored lower on arousal, orgasm frequency and had more difficulty getting orgasms (Caruso, Agnelo, Malandrino, Lo Presti, Cicero, & Cianci, 2014). A study showed that the longer the relationship, the lower satisfaction with sexual life. The study revealed though, that women in long lasting relationships were more open about sex communication, which had a positive impact on sexual satisfaction (Montesi et al., 2010).

A decline sexual life has been found to be associated with marital status, not being married had a negative impact on sexual life (Faisal-Cury et al., 2015). Our findings, revealed that mothers had a higher orgasm satisfaction, meaning that they could orgasm more easily and more intensely than non-mothers, even if most of the participants defined as mothers in this study were either cohabiting, in a civil partnership or married, 76 percent. Previous research is all relating to couple's heterosexual relationships (Bellamy et al., 2011; Pascoal Monteiro et al., 2013; Trice-Black, 2010). One difference may be that when exploring orgasm satisfaction, the length of the relationship does not matter, because women can masturbate and therefore still orgasm easily and intensely without a partner (Leff & Israel, 2013). Women in relationships longer than a year have a more open communication with their partner about sex, leading to a higher satisfaction with their overall relationship satisfaction but not having an impact on sexual satisfaction (Montesi et al., 2010). If assuming that the married mothers, in the current study, have been in a relationship longer than one year, and therefore are more

able to have a better sexual communication with their partners, may be explain why the group of mothers scored higher on orgasm satisfaction but not sexual satisfaction. A limitation though, is that no information on the length of relationships was collected, and therefore it was not possible to further test if the length of the relationship mothers, and non-mothers, had, influenced their orgasm satisfaction. Although it might not affect the outcome, since a woman can control her orgasm satisfaction better than her sexual satisfaction. Women's view on sex and intimacy changes during pregnancy and after childbirth, leading to loss of libido due to both psychological and physiological changes (Woolhouse et al., 2012). In the transition to motherhood and specially during the first years after delivery, women experience a clear change both in regard to the physical ability to experience sexual satisfaction but also the mental ability to feel satisfied with their own sexuality (Bellamy et al., 2011; Faisal-Cury et al., 2015; Hansson & Ahlborg, 2015; McDonald et al., 2017; Montemurro & Siefken, 2012; Trice-Black, 2010; Woolhouse et al., 2012). Findings from the current study revealed though, that orgasm satisfaction is higher after childbirth for women. Which indicates that the loss of libido may not affect orgasm satisfaction but only sexual satisfaction, which is, contrary to orgasm satisfaction, dependent on others.

The perceived self-image of the female body changes after given birth, having a negative impact on sexuality. Feeling less sexy, parts of the body, like breasts, being de-sexualized, weight gain making them feel less attractive, were some of the factors brought up by mothers (Montemurro & Siefken, 2012; Woolhouse et al., 2012). However, the transition to motherhood can also, for some women, lead to self-discovery in terms of, maturity, acceptance of the self, better body awareness and a more positively body image leading to mothers embracing their sexuality by allowing themselves to be proud of themselves (Montemurro & Siefken, 2012). This could be a potential reason to our findings, having a better body awareness can lead to also having a higher orgasm frequency, even though, sexual frequency is not increased. Also, higher score on genital response during arousal among mothers can be explained by this phenomenon. Although, sexual arousal does not necessarily have to be correlated with genital response (Graham et al., 2004) orgasm does, since it is a direct physical response in the genitals reflecting the last phase of female sexual response in the cycle of response (Helström, 2009). The findings, showing a difference between mothers

and non-mothers in both genital response and orgasm satisfaction can be a result of a higher body awareness, a more positively body image and acceptance of the self.

Also, taking into consideration that most of the studies stating a decreasing satisfaction with sexual life among mothers are conducted in other countries than Sweden (Bellamy et al., 2011; Faisal-Cury et al., 2015; Hansson & Ahlborg, 2015; McDonald et al., 2017; Montemurro & Siefken, 2012; Trice-Black, 2010; Woolhouse et al., 2012) and furthermore, that previous studies have pointed out the importance of gender equality in relationships as a positive impact on sexual satisfaction, intimacy and relationships (Hansson & Ahlborg, 2015; Woolhouse et al., 2012), might also contribute to explaining our findings. Sweden is considered one of the world's most equal countries when it comes to gender equality. It is in third place, right after Iceland and Finland in the latest report from the World Economic Forum (World Economic Forum, 2018). Exploring the new concept of orgasm satisfaction within other cultures than the Swedish may result in different outcomes.

Method discussion

Having an appropriate study design is very important since it determines the premises for how the study will achieve high validity, reliability, and generalizability to the larger population. The current study design used cross-sectional design since the phenomenon being studied is time- and social context dependent. Cross sectional data is recommended when studying the associations between different factors (Polit & Beck, 2017).

The data from the current study was collected through the internet and through convenience and snowball sampling. Online data collection is economically beneficial. In addition, the survey is relatively easy to complete because the answers are multiple choice and the survey can reach a abroad amount of participants. A potential limitation to this method is that the sample can be less representative compared to if the data is collected through other sources (Polit & Beck, 2017). A large sample of the participants defines themselves as bisexuals, 21.8 percent, which is not representative for the population. According to two different reports only 2 to 2.8 percent of the swedish population defines themselves as bisexuals, the number increases among young people but still does not reach 20 percent (Forte, 2018; Statens

offentliga utredningar, 2017:92). However, there are indications of bisexuality being more common than reported when data is collected in other ways than online surveys. A study conducted in Sweden comparing the outcome of two identical questionnaires on sexual behavior with the aim of ascertain the biases and further comparability between two different recruitment methods, came to the conclusion that, even if there were differences for instance when analyzing sexual orientation resulting in a higher percent reporting being bisexual or homosexual online, the two methods of collecting data are comparable with each other (Ross, Månsson, Daneback, Cooper, & Tikkanen, 2005). This is quite similar to what other researchers have stated in their studies showing that online based surveys allows respondents to be more open and honest resulting in a higher accuracy when disclosing sensitive information about themselves such as sexual orientation leading to a higher proportion of bisexuals compared to more traditional data collection methods such as interviews or questionnaires (Turner, Ku, Rogers, Lindberg, Pleck, & Sonenstein, 1998). This would then challenge the government reports as to what percent of the population really is bisexual. Most of the participants had a high level of education, 82.8 percent, while in Sweden 27 percent has a University or College degree (Statistiska centralbyrån, 2018a). However, the samples lopsided was controlled for in the regression and this reduced the risk of sample bias.

Collecting data through internet also limits the population possibility to participate who may have contributed with important data affecting the outcome since not all individuals have access to internet (Polit & Beck, 2017). On the other hand almost, all of the Swedish population 16 to 85 years old have access to internet according to the national statistics bureau (Statistiska centralbyrån, 2018b).

While randomized sampling may yield a more representative sample the data (Polit & Beck, 201) was collected through non-randomized method since it was a potentially sensitive topic being examined and this was a more convenient method to reassure the possibility of identifying respondents and ensure having enough respondents to conduct the study. Two main weaknesses to convenience sampling are that it increases the risk of bias and also decreases the studies generalizability (Polit & Beck, 2017) which in the present has a negative impact on the possibility of generalizability of the study. On the other hand, the fact that the respondents answered the survey anonymously, allowed the researchers to gain a large sample

size, over 2000 participated in the study, which affects, in a positive way, the ability to respond to the study's purpose and the study's reliability increases. Large sample sizes increase the possibility of generalizability since sampling error decreases. This also motivates the choice of collecting data through Internet since the survey could reach many people quickly and anonymously (Polit & Beck, 2017). Since no data on geographical factors, type of education possibly having an impact on the result caused by the respondents pre-understanding of the subject being analyze, no knowledge on relationship satisfaction is known and the unequal variance in age and sexual orientation reduces the studies generalizability. However, since no the studies have explored orgasm satisfaction as an independent variable, and moreover, studies on women's sexuality are mostly focused on heterosexuals and are based on smaller samples (Bellamy et al., 2011; Pascoal Monteiro et al., 2013; Trice-Black, 2010) than the current study, having a large sample was important, even if the results may not be generalizable.

Another limitation in regard to the elected data collection method is the fact that by using a self-selection approach, meaning that people with special interest in the topic, sexuality, may be keener to participate and this results in an unavoidable sampling bias (Polit & Beck, 2017). However, the variability in the sample was large and possible lopsided sampling was controlled for using regression analysis.

The survey was anonymous which is a potential limitation since the researchers did not have access to background factors from the respondents possibly affecting the outcome. For example, the current survey did not ask the women’s exact age or her geographical location, and therefore, exact analyses based on her age or location could not be completed. On the other hand, the range for age is only five years in each group, and thus allowing us to still control for age-related factors. Other factors, possibly having an impact on the outcome could be the fact that there is no information about how many children the mothers had, the children’s age or if they have lost their child. Previous studies have shown that having small children affects the parents’ identity and that it has a negative impact on their relationship, including their sexual and overall health (Hansson & Ahlborg, 2011; McDonald et al., 2017) Also, not having more information about the nature of the relationships, for those being in a relationship, such as the length of their relationship or the time elapsed since their last

relationship, for the women who stated they were single, also increases the risk of bias (Polit & Beck, 2017). A previous study has shown that being in love has a positive impact on sexual satisfaction compared to not being in love (Neto & da Conceição Pinto, 2013). Other studies state that a relationships duration affects and changes the experience of passion and intimacy and that the two concepts are not always correlated in a linear way which can have an impact on the perceived satisfaction for the individual in regard to sexual satisfaction (Baumeister & Bratslavsky, 1999; Graham, Mercer, Tanton, Jones, Johnson, Wellings, & Mitchell, 2017).

Since the data did not provide any information about the age of the children, which is a factor with potential of having an impact on the outcome, since, having children living at home, the risk of negative impact on orgasm satisfaction can increase. This is a potential risk of bias since the confounding having an impact on the outcome is not controlled for. However, a sensitive analysis is recommended to assess differences in results when having missing values (Polit & Beck, 2017). This was applied after truncating the sample to only include women aged between 20-44 years old. The probability of these mothers having children living at home is higher than for those aged over 44. The analysis revealed similar results, the same statistical significance was presented as for the total sample except for women aged 20-44 were the statistical difference was lower but still significant. The sensitive analysis shows that the potential confounding, having small children or children living at home, is not a factor impacting on orgasm satisfaction.

Defining the populations characteristics through inclusion and exclusion criteria is fundamental to achieve high validity (Polit & Beck, 2017). Based on the information available in the database, inclusion and exclusion criteria applied in order to have a sample of participants who represented the studied population.

Not limiting the data collection to only be confidential does not allow researchers to contact the respondents if needed, for complete questions, follow up on missing data, with the aim of avoiding misinterpretation (Polit & Beck, 2017). However, in the current study potential limitation was avoid by exclusion criteria, cases with missing data were not part of the study.

Moreover, since the survey consisted of mostly click options and close ended questions, the risk of code errors was reduced, since the respondents only have predetermined options. However, a disadvantage with this is that when not allowing respondents to freely formulate their answers the gained information researchers have is limited. It opens up the possibility for misinterpretation (Polit & Beck, 2017). The question on motherhood is formulated in such a way that it poses a potential risk of sample bias. Only women who have given birth are classified as mothers, which does not necessarily represent the reality of all female participants. A woman can be a mother without giving birth to her children, such as adoptive mother, stepmother or be in a homo- or bisexual relationship were the partner is the one giving birth but both define themselves as mothers. The researchers are aware of this potential bias and therefore defined the concept of mothers and report this risk of bias in the method section. On future research it is recommendable to try to avoid such potential risks of bias at asking more specific questions on motherhood.

This type of survey design is easier to analyze and there is no space for interpretation of the data, which increases the reliability and validity of the study. This method also increases the likelihood of participants willing to be part of the study since it does not require as much time as open-ended questions. A limitation though is that the researcher is not able to gain a deeper understanding of the phenomenon being studied. A way of overcoming this is having a survey with both open ended and closed ended questions (Polit & Beck, 2017). The current study only includes close ended questions in the analyses since they were the only ones accessing the study's aim. The online survey could only be answered once by the same respondent. In doing so, the risk of sample bias decreases by ensuring the collected data comes from different respondents (Polit & Beck, 2017).

A problem with the survey was detected when analyzing the question on orgasm experience and the follow up question to those having had an orgasm. 40 respondents did not had experience of orgasm, yet when analyzing the data on the orgasm frequency there was not as many missing answers as it should be if considering that frequency is dependent on actually having experience of orgasm. This reveals the consequences of limiting the researchers possibility to contact respondents as a direct effect on anonymity which could be avoid if

confidentiality was the method chosen for the survey instead of anonymity (Polit & Beck, 2017).

The data was collected from an already existing database where the survey used to collect information was tested by a pilot study in order to improve and minimize the risk of bias (Nordin & Hedlöf, 2018).

Another possible limitation is the created variable, used as controlling factors, confounding, did not had a Cronbach's alpha over 0.8 which is the recommendable score to increase internal consistency (Polit & Beck). However, studies have shown that a score at 0.7 is good enough to guarantee a satisfactory internal consistency (Tavakol & Dennick, 2011). Moreover, even if Cronbach's alpha did not reach a score over 0.7 on every compiled variable, the results showed the same pattern on the individual item levels, which indicates that the outcome is reliable even without an internal consistency scoring over 0.7. Indicating that the trend still went in the same direction as when grouping the items into compiled variables. This shows that the reliability of grouping the variables is, even when not achieving a score over 0.7, high. The trend was similar for each individual variable as well as for the compiled variables.

Also, the variables only consisted of three to five items compiled into one variable which is fewer than most of the created variables usually consist of (Norman, 2010). The more items included in a created variable the higher the Cronbach's score gets since internal consistency is a measure to control if the variable really is measuring what it claims to measure (Polit & Beck, 2017). Cronbach's alpha is affected by the number of variables that constitute the new variable, the Spearman- Brown formula can be used to further test the internal consistency to better understand the role that the number of items played in determining the Cronbach's alpha score (Eisinga, Grotenhuis, & Pelzer, 2013). However, Since the Cronbach's score was not satisfactory high Spearman-Brown formula was applied to calculate how many items were needed to gain a satisfactory Cronbach's alpha, which is recommended by Polit & Beck (2017). After Spearman Brown formula the score for the compiled variable sexual frequency increased from 0.52 to 0.76 if items included were tripled (3*(0.52)/([1+3-1]*.52 1.56/2.04=0.76). After applying Spearman-Brown formula the score for the compiled variable

sexual dysfunction from 0.53 to 0.77 if tripled the items included (3*.53/[1+[3-1]*.53) 1.59/2.06=0.77). After Spearman-Brown formula the score for the measure outcome variable orgasm satisfaction increased from 0.69 to 0.82 if the numbers of items were doubled (2*0.69)1+(2-1) *0.69=1.38/1.69=0.82). These scores are statistically acceptable, showing a satisfactory internal validity for the compiled variables.

Another potential limitation was risk of objectivity when creating the variables which is difficult to avoid (Polit & Beck, 2017). However, the risk was reduced through statistical analysis controlling for a high internal validity and a high adjusted R when testing through regression. Even though face validity is not a strong evidence ensuring validity of an instruments capability of measuring what it intends it is a way of doing a primary evaluation of it (Polit & Beck, 2017) and this was also done when creating the variables. When creating the measure outcome variable, orgasm satisfaction, face validity tended to point towards including the item orgasm frequency. However, this item was on a different range scale than the other items included in the compiled measure outcome variable, which made it not possible to include it on the compilation, and moreover, can be potentially be part of explaining why the adjusted R-square did not reach a higher score.

There are researchers showing that when creating compiled variables of likert scales items the data can and should be treated as numeric continuous and therefore also analyzed with statistical tests, such as linear regression and t-test (Norman, 2010; Sullivan, & Artino, 2013). Since the aim of this study was to assess differences in orgasm satisfaction between two groups, data was therefore treated as continuous numeric scale allowing a more in-depth analysis of the phenomena.

The data was assumed having a normal distribution which may not be so and therefore can result in a misinterpretation of the outcome since the data analysis method is one used for data with normal distribution. There is a conflict between statisticians and researchers from different fields claiming were some claims that likert scales can be treated as numeric continuous data (Norman, 2010; Sullivan & Artino, 2013) and therefore can be analyzed using linear regression and reporting means and standard deviation from t-test, and there are those claiming this is wrong since ordinal data is not interval and therefore should not be

treated as if it was since the analysis then would "not take into account the ordinal nature of the outcome and hence the estimated odds ratios may not address the questions asked of the analysis" (Hosmer, Lemeshov, & Sturdivant, 2013,p. 289). A weakness with this data analysis method is that the whole aspect of a phenomenon is not studied since it is divided into different factors and each factor is analyzed separately, which results in an incomplete description of a concept (Norman, 2010; Sullivan & Artino, 2013).

Ethical aspects

The requirements brought up by the Swedish science council (Vetenskapsrådet, 2002) to ensure good ethical compliance were taken into consideration when conducting the study. The confidentiality requirement and the requirement for use were, together with the principle of respect for autonomy, fulfilled through letters of information and consent given to potential respondents prior to their participation, as recommended (Beauchamp & Childress, 2009; Vetenskapsrådet, 2002). The participation in the study was completely voluntary and it was not binding to participate, meaning that once the survey was started the respondent was capable of interrupting their participation.

The confidentiality requirement was met by the survey being answered anonymously. The researchers did not have any access to any personal data that could be derived from the respondents. All data in the database is coded, both for the researchers and outsiders. Moreover, it has been treated anonymously during the whole procedure. Since the data being collected is considered a high sensitive topic (Dickson-Swift, James, & Liamputtong, 2008) the risk of respondents being offended by the surveys questions was inevitable. However, the benefits of the study were greater than the potential risk of offending participants by the way the questions were formulated. And therefore, to reduce the risk of harming, actions were taken in terms of securing anonymity, stating through letters that the study was voluntary and moreover by formulating questions in a way that they did not exclude people. This was part of the researchers attempt to fulfill the principle of justice, were equality and fairness is the base of assuring right to, regardless of individual characteristics such as gender and age, contribute, share and be respected and be listened to (Beauchamp & Childress, 2009).

To minimize the risk of potentially harm participants or others affected by the study, by causing pain, suffering or offense researchers made sure that the data was treated, not only anonymous, but correctly in the sense of assuring a high validity to provide correct information when reporting results. There is still a potential risk that the population the sample aims to represent may be offended by the results. However, according to the Swedish Research Council, when there is a risk that people will be offended by the results, a trade-off between benefits and benefits will be made (the Swedish Research Council, 2002). The researchers here, in this respect, made a balance and concluded that the benefit to the study's results outweighs a potential injury. This has been done based on the ethical principle of beneficence, where the conditions potentially harming others, such as violating the participants autonomy and moreover, their right to remain anonymous (Beauchamp & Childress, 2009) was ensured. On the other hand, the ethical aspect of enabling respondents to take part of the study's results before being presented to others (Vetenskapsrådet, 2002), it was not possible to live up to, because the researchers did not have access to information that could allow a feedback with the participants. This was also the result of an ethical consideration taken to assure anonymity, which is part of the ethical principle of the right to, and respect for anonymity and according to some researchers is the most important in the hierarchical rank of the ethical principles. Although, not all researchers would agree on this statement but rather say that all the principles of ethics are in some way dependent to each other and therefore it is not possible to rank them according to a hierarchical order (Beauchamp & Childress, 2002).

Although, ethical approval is not mandatory for studies on this academic level (*Lag om etikprövning av forskning som avser människor*, SFS 2003; 460), the topic being assessed can potential be perceived as sensitive (Dickson-Swift et al., 2008) and therefore, future researches are recommended to apply for ethical approval to enable a deeper analyses of the concept of orgasm satisfaction and gain a greater understanding of the phenomena.

Clinical implications

Previous studies have shown lack of knowledge among midwives regarding sexual health and how to address the topic, lack of time, and health care system’s organization are contributing

factors presented by midwives for them not being able to be more involved and provide proper care for women seeking advice about sexual related problems (Wendt et al., 2009; Olsson et al., 2009).

The right to sexual health is fundamental (WHO, 2010a). The definition of quality of life is, according to WHO (1948) "an individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns" Moreover WHO states that "It is a broad ranging concept affected in a complex way by the person's physical health, psychological state, personal beliefs, social relationships and their relationship to salient features of their environment" (1948).

Studies have shown correlation between quality of life, very good/excellent health and frequency of sex and/or interest in sex activity (Davidson, Belle, LaChina, Lee Holden, & Davis 2009; Lindau & Gavrilova, 2010). Sexual health is a fundamental part of the concept quality of life due to the fact that it involves so many aspects of the human´s identity and living conditions (Yuen Loke, 2013). A study from 2016 whose aim was to study the importance of sexual health for quality of life came to the conclusion that sexual health is a very important part of quality of life and remains being so even for individuals having other health related problems. Addressing sexual health should be incorporated in the health care system to achieve a better overall health and improve quality of life for the population across the whole lifespan (Flynn, Lin, Watkins Bruner, Cyranowski, Hahn, Jeffery, Barsky Reese, Reeve, Shelby, & Weinfurt, 2016). The findings in the current study increases midwives knowledge on how orgasm satisfaction, sexual frequency and genital response changes for women across lifespan and moreover with childbirth. The findings revealed for example that 20-24 years old's have the least orgasm satisfaction for age groups, as well as being single. Women in these age group, and women defining themselves as single, may therefore be in greater need for more counselling and support from midwives to achieve orgasm satisfaction. With the information provided by our finding's midwives can identify potential problems women might face and address them to prevent sexual health related issues having a negative impact on women's health.

Social Benefits

Despite Sweden being one of the world's most gender equal countries (World economic Forum, 2018) there is a great difference between women's and men's health in Sweden (Regeringskansliet, 2018; Statistiska centralbyrån, 2018 b). To achieve gender equality the government of Sweden formulated six different goals; Equal distribution of power and influence, Economic equality, Equal education, Equality of distribution of the unpaid home and care work, Equal health and finally that Men's violence against women should cease (Statistiska centralbyrån, 2018a). According to the collected information from Statistiska centralbyrån (2018a) there are still gaps between men and women in terms of health, household and childcare among other areas (World Economic Forum, 2018). According to a study made in Sweden one of the reasons for divorce/separation among parents to small children was lack of equality in regard to household and childcare (Hansson & Ahlborg, 2015). This is also confirmed by another study, in which women state that when becoming parents, the gender roles turn out to be more traditional, even in couples where there has previously been equality between them (Woolhouse, et al., 2012). In 2017, 24 210 divorces took place in Sweden (Statistiska centralbyrån, 2018c). Studies have shown that lack of intimacy was one factor who increased the divorces. Lack of sensual life and lost of passion was also an affecting factor (Hanson & Ahlborg, 2015). This has an impact on the overall health of not only the individuals who are separating/divorcing but also on children and the rest of the families surrounding them leading to cost for the whole society due to the fact that the health care system has to make efforts to provide healthcare (Leopold, 2018).

Gender equality is brought up by many women in different studies, all of them pointing out the importance of equality in a relationship for the feeling of satisfaction with sexuality, intimacy and relationships (Hansson & Ahlborg, 2015; Woolhouse et al., 2012). Since 2015 Swedish Government has invested in improving women's health. Both economically and politically, in order to reduce the gender gaps (Regeringskansliet, 2017). The findings of this study have a great possibility of improving women's health by increasing knowledge about sexual related issues and by doing so it the whole society gains from it.

Conclusion

Findings point out that there is a difference between the concepts sexual satisfaction and orgasm satisfaction. It was possible to expand the concept of orgasm satisfaction from only including ease to orgasm, orgasm frequency and satisfaction with orgasm experience, to in lue, include more aspects. By including the following items i) I consider myself a sexual person, ii) I orgasm easily when masturbating, iii) I orgasm easily when I have sex with one or more people, iv) I am satisfied with my sex life, and v) how intense do you experience your typical orgasm? The definition of orgasm satisfaction is broadened.

Mothers' orgasm satisfaction as well as genital response during sexual activity is higher than non-mothers. Mothers are able to produce orgasms more easily and more intensely than non-mothers. Since this is the first study focusing on orgasm satisfaction, future research should aim to confirm the findings of this study to better understand the meaning of orgasm satisfaction.

Since this is the first study focusing on orgasm satisfaction, future research should aim to confirm the findings of this study to better understand the robustness of orgasm satisfaction.

Future studies should explore the concept, orgasm satisfaction, within other cultures than the Swedish to find out if the phenomena are dependent on sociocultural aspects, as gender equality, or if the results are valid for all women regardless of their cultural habitat, that is, exploring if demographic factors have an impact on orgasm satisfaction. More studies on how orgasm satisfaction differs from sexual satisfaction may increase women's sexual health since focus will not be depending on women's dependency on others. And moreover, provide midwives with better knowledge on sexual health among women.

Acknowledgement

This study was possible thanks to the exceptional guidance of Michael Benjamin Wells, PhD at Karolinska Institutet Department of Global Health.

No conflict of interest is reported by the authors.

Karolinska Institutet

References

American Psychiatric Association (2005). Diagnostic and Statistical Manual of Mental Disorder. (4th ed). Retrieve 20190312 from http://displus.sk/DSM/subory/dsm4.pdf

Basson, R., (2000). The female Sexual Response: A Different Model. *Journal of Sex & Marital Therapy,26*(1), 51-65. doi: 10.1080/009262300278641

Basson, R. (2001). Female sexual response: the role of drugs in the management of sexual dysfunction. *Obstetrics & Gynecology, 98*(2), 350-353. doi: 10.1016/S0029-7844(01)01452-1

Basson, R., Brotto, A. L., Laan, E., Redmond, G., & Utian, H. W. (2005). Women's Sexual Dysfunctions: Assessment and Management of Women's Sexual Dysfunctions: Problematic Desire and Arousal. *The Journal of Sexual Medicine, 2*(3). 291-300. doi: 10.1111/j.1743-6109.2005.20346.x

Basson, R., (2011). A Model of Women's Sexual Arousal. *Journal of Sex & Marital Therapy,28*(1), 1-10. doi:10.1080/009262302317250963

Baumeister, F. R., & Bratslavsky, E. (1999). Passion, Intimacy, and Time: Passionate Love as a Function of Change in Intimacy. *Personality and Social Psychology Review, 3*(1), 49-67. doi: 10.1207/s15327957pspr0301_3

Beauchamp, L. T., & Childress, F. J. (2009). Principles of Biomedical Ethics. New York: Oxford University Press.

Bellamy, G., Gott, M., Hinchliff, S., & Nicolson, P. (2011). Contemporary women's understandings of female sexuality: findings from an in-depth interview study. *Sexual and Relationship Therapy,26*(1), 84-95. doi: 10.1080/14681994.2010.523074

Bohlen, G. J., Held, P. J., Olwen Sanderson, M., & Ahlgren, A. (1982). The Female Orgasm: Pelvic Contractions. *Archives of Sexual Behavior(11)*5, 367-386. https://www.ncbi.nlm.nih.gov/pubmed/7181645

Borgfeldt, C., Åberg, A., Anderberg, E., & Andersson, U.B. (2010). Obstetrik och gynekologi (4., [uppdaterade] uppl. ed.). Lund: Studentlitteratur AB.

Brattberg, A., & Hulter, B. (2010). Samtal- en del i utredningen av sexuella problem. In Lundberg, P. O., & Löfgren- Mårtenson, L. (Eds.), *Sexologi* (3. ed., p. 274-282). Stockholm: Liber.

Buisson, O., & Jannini, A. E. (2013). Pilot Echographic Study of the Differences in Clitoral Involvement following Clitoral or Vaginal Sexual Stimulation. The Journal of Sexual Medicine, 10(11), 2734-2740. doi: 10.1111/jsm.12279

Caruso, S., Agnello, C., Malandrino, C., Lo Presti, L., Cicero, C., & Cianci, S. (2014) Do hormones influence womens sex? Sexual activity over the menstrual cycle. *The Journal of Sexual Medicine, 11*(1), 211-221. doi: 10.1111/jsm.12348.

Chivers, L. M., Rieger, G., Latty, E., & Bailey, M. (2004). A Sex Difference in the Specificity of Sexual Arousal. *Psychological Science, 15*(11), 736-744. doi: 10.1111/j.0956-7976.2004.00750.x

Chivers, L. M., & Bailey, M. (2005). A Sex Difference in Features that Elicit Genital Response. *Biological Psychology, 70*(2), 115-120. doi: /10.1016/j.biopsycho.2004.12.002

Davidson, S. L., Bell, J. R., LaChina M., Lee Holden, S., & Davis, R. S. (2009). The relationship between Self-Reported Sexual Satisfaction and General Well-being In Women. *International Society for Sexual Medicine,6*(10), 2690-2697. doi: 10.1111/j.1743-6109.2009.01406.x

Dickson- Swift, V., James, L. E., & Liamputtong, P. (2008). Undertaking Sensitive Research in the Health and Social Sciences. Retrieved 20190311 from http://assets.cambridge.org/97805217/18233/excerpt/9780521718233_excerpt.pdf

Eldridge, K. F., & Giraldi, A. (2017). Communication about sexual matters with women attending a Danish fertility clinic: A descriptive study. *Sexual Medicine, 5*(3), 196-202. doi: 10.1016/j.esxm.2017.06.005.

Eisinga, R., Grotenhuis, M. & Pelzer, B. (2013). The reliability of a two-item scale: Pearson, Cronbach, or Spearman- Brown? *International Journal of Public Health, 58*(4), 637-642. doi: /10.1007/s00038-012-0416-3

Faisal-Cury, A., Huang, H., Chan, Y.F., & Rossi Menezes, P. (2013). The Relationship Between Depressive/Anxiety Symptoms During Pregnancy/Postpartum and Sexual Life Decline after Delivery. *The Journal of Sexual Medicine, 10*(5), 1343-1349. doi:10.1111/jsm.12092

Faisal-Cury, A., Rossi Menezes, P., Quayle, J., Matijasevich, A., & Grilo Diniz, S. (2015). The Relationship Between Mode of Delivery and Sexual Health Outcomes after Childbirth. *The Journal of Sexual Medicine,12*(5),1212-1220. doi: 10.1111/jsm.12883

Fileborn, B., Lyons, A., Heywood, W., Hinchliff, S., Malta, S., Dow, B., … Minichiello, V. (2017). Talking to healthcare providers about sex in later life: Findings from a qualitative study with older Australian men and women. *Australasian Journal on Ageing,36*(4), 50-56. doi: 10.1111/ajag.12450.

Flynn, E., Lin, L., Watkins Bruner, D., Cyranowski, M. J., Hahn, A. E., Jeffery, D. D., Barsky Reese, J., Reeve B. B., Shelby, R. A., & Weinfurt, P. K. (2016). Sexual Satisfction and the Importance of Sexual Health to Quality of Life Througout the Life Course of U.S. Adults. Journal of Sexual Medicine, 13(11). 1642-1650. doi: doi.org/10.1016/j.jsxm.2016.08.011

Folkhälsomyndigheten. (2018). *Sexuell och reproduktiv hälsa och rättigheter för alla. Sammanfattning av Guttmacher- Lancet- kommissionens slutrapport.* Retrieved 20190124 from https://www.folkhalsomyndigheten.se/publicerat-material/publikationsarkiv/s/sexuell-och-reproduktiv-halsa-och-rattigheter-for-alla-/?pub=56256

Forsberg, M. (2010). Etnicitet och mångkulturella aspekter på sexualitet. In Lundberg, P O., & Löfgren- Mårtenson, L. (Eds.), *Sexologi* (3. ed., p. 143-148). Stockholm: Liber.

Forte, Forskningsområdet för hälsa, arbetsliv och välfärd. (2018). *Hälsa och livsvillkor bland unga HBTQ- personer. Vad vet vi och vilka forskningsbehov finns?* Stockholm: Brand Factory

Gambone, J. (2010). Sexuality and Female Sexual Dysfunction. In Hacker, F. N., Gambone, C. J., & Hobel, J. C. *(Eds.), Hacker and Moore's essentials of obstetrics and gynecology* (5th ed., p. 315- 321). Philadelphia, PA: Saunders/Elsevier.

Glasier, A., Gülmezoglu Metin, A., Schmid, P. G., Moreno Garcia, C., & Van Look, F.A. P. (2006). Sexual and reproductive health: a matter of life and death. *The Lancet, 368*(9547), 1595-1607. doi: 10.1016/S0140-6736(06)69478-6

Graham, A. C., Sanders, A. S., Millhausen, R. R., & McBride R. K. (2004). Turning On Turning Off: A Focus Group Study of the Factors That Affect Women's Sexual Arousal. *Archives of Sexual Behavior, 33*(6), 527-538. doi: 10.1023/B:ASEB.0000044737.62561.fd

Graham, A. C., Mercer, H. C., Tanton, C., Jones, G. K., Johnson, M. A., Wellings., & Mitchell R. K. (2017). What factors are associated with reporting lacking interest in sex and how do these vary by gender? Findings from the third British national survey of sexual attitudes and lifestyles. *BMJ,7*(9), 1-22. doi 10.1136/bmjopen-2017-016942

Hansson, M., & Ahlborg, T. (2011) Quality of the intimate and sexual relationship in first-time parents- A longitudinal study. *Sexual and Reproductive Healthcare,3*(1), 21-29- doi: /10.1016/j.srhc.2011.10.002

Hansson, M., & Ahlborg, T. (2015). Factors contributing to separation/divorce in parents of small children in Sweden. *Nordic Psychology,00*(0), 1-18. doi:10.1080/19012276.2015.1071201

Helström, L. (2009). Sexologi. I Kaplan, A., Hogg, B., Hildingsson, I., & Lundgren, I. (Red.), *Lärobok för barnmorskor.* (s. 671-678) Lund: Studentlitteratur

Helmius, G. (2010). Sociosexuell utveckling i ungdomsåren. In Lundberg, P O., & Löfgren-Mårtenson, L. (Eds.), *Sexologi* (3. ed., p. 86-90). Stockholm: Liber.

Hosmer, D., Lemeshow, S., & Sturdivant, R. (2013). Applied logistic regression (3rd ed., Wiley series in probability and statistics). Hoboken: Wiley. Retriwed 20190222 from https://onlinelibrary.wiley.com/doi/pdf/10.1002/9781118548387

Hulter, B. (2017). Sexuell Hälsa. I Lindgren, H., Christensson, K., & Dykes, A. (Red.), *Reproduktiv hälsa: Barnmorskans kompetensområde.* (p. 65-67). Lund: Studentlitteratur.

Hälso- och sjukvårdslag (SFS 2017:30). Stockholm: Socialdepartementet.

Johannisson, K. (2010). Sexualiteten i historien. In Lundberg, P O., & Löfgren- Mårtenson, L. (Eds.), *Sexologi* (3. ed., p. 124-131). Stockholm: Liber.

Komisaruk, R. B., Beyer-Flores, C., & Whipple, B. (2006). *The Science of Orgasm.* Maryland: The Johns Hopkins University Press

Lag om etikprövning av forskning som avser människor. (SFS: 2003:460). Retrieved 20190123 from Riksdagens web page https://www.riksdagen.se/sv/dokument-lagar/dokument/svensk-forfattningssamling/lag-2003460-om-etikprovning-av-forskning-som_sfs-2003-460

Larsson, M., & Steiner, A. (2010). In Lundberg, P. O., & Löfgren- Mårtenson, L. (Eds.), *Sexualitet i ord och bild* (3. ed., p 157-162). Stockholm: Liber.

Leff, J. J., & Israel, M. (2013). The relationship between mode of female mastrubation and achievement of orgasm in coitus. *Archives of Sexual Behaviour, 12*(3), 227-236. doi: 10.1007/BF01542073

Lennerhed, L. (2010). Makten över reproduktionen- preventivmedel, abort och sterilisering i historiskt perspektiv. In Lundberg, P. O., & Löfgren- Mårtenson, L. (Eds.), *Sexologi* (3. ed., p 132-136). Stockholm: Liber.

Lewin, B. (2010). Sexualiteten som social konstruktion. In Lundberg, P. O., & Löfgren-Mårtenson, L. (Eds.), *Sexologi* (3. ed., p. 115-123). Stockholm: Liber.

Lindau, S.T., & Gavrilova, N. (2010). Sex, health, and years of sexually active life gained due to good health: evidence from two US population based cross sectional surveys of ageing. *BMJ: British Medical Journal (Overseas & Retired Doctors Edition),340*(7746), 810. doi:10.1136/bmj.c810

Lindgren, L. (2010). Parrelationer, utveckling och strategisk behandlingsplanering. In Lundberg, P O., & Löfgren- Mårtenson, L. (Eds.), *Sexologi* (3. ed., p. 95-100). Stockholm: Liber.

McDonald, E., Woolhouse, H., & Brown, J. S. (2017). Sexual pleasure and emotional satisfaction in the first 18 months after childbirth. *Midwifery,55,* 60-66. doi: 10.1016/j.midw.2017.09.002.

Mercer, C.H., Tanton, C., Prah, P., Erens, B., Sonnenberg, P., Clifton, S., … Johnson, M.A. (2013). Changes in sexual attitudes and lifestyles in Britain through the life course and over time: findings from the National Surveys of Sexual Attitudes and Lifestyles (Natsal). *The Lancet, 382*(9907), 1781–1794. doi: 10.1016/S0140-6736(13)62035-8

Meston, C. M., Hull, E., Levin, R.J., & Sipski, M. (2004). Disorder of orgasm in women. *Journal of Sexual Medicine, 1*(1), 66-68. doi: 10.1111/j.1743-6109.2004.10110.x

Meston, C. M., Levin, J. R., Sipski, L. M., Hull, M. E, Heiman, R. (2012). Women´s Orgasm. Annual Review of Sexual Research, 15(1), 173-257. doi: doi.org/10.1080/10532528.2004.10559820

Montemurro, B., & Siefken, M. J. (2012). MILFS and Matrons: Images and Realities of Mother´s Sexuality. *Sexuality and Culture,16*(4), 366–388. doi:10.1007/s12119-012-9129-2

Montesi, L. J., Fauber, L. R., Gordon, A. E., & Heimberg, G. R .(2010). The specific importance of communicating about sex to couples´sexual and overall relationship satisfaction. *Journal of Social and Personal Relationship,28*(5), 591-609. doi: 10.1177/0265407510386833

Neto, F., & da Conceição Pinto, M. (2013). The Satisfaction with Sex Life Across the Adult Life Span. *Social Indicators Research, 114*(3), 767-784. doi: 10.1007/s11205-012-0181-y

Nordin, A., & Hedlöf J. (2018). *An Online Survey of Swedish Women´s Sex Lives: Investigating their satisfaction of sex life, perceived genital response and the need for a word describing female genital response.* (Examensarbete/Master thesis, Karolinska Institutet, Stockholm).

Norman, G. (2010). Likert scales, levels of measurement and the “laws” of statistics. *Advances in Health Sciences Education*, *15*(5), doi doi.org/10.1007/s10459-010-9222-y

Nowosielski, K., Wróbel, B., & Kowalczyk, R. (2015). Women's Endorsement of Models of Sexual Response: Correlates and Predictors. *Archives of Sexual Behavior,45*(2), 291-302. doi: 10.1007/s10508-015-0611-4

Olsson, A., Robertson, E., Falk, K., & Nissen, E. (2009). Assessing women's sexual life after childbirth: the role of the postnatal check. *Midwifery, 27*(2011), 195-202. doi: 10.1016/j.midw.2009.04.003

Ortigue, S., Grafton, S.T., Bianchi- Demicheli, F. (2007). Correlation between insula activation and self-reported quality of orgasm in women. *Elsevier, 37*(2), 551-560. doi: https://doi.org/10.1016/j.neuroimage.2007.05.026

Pascoal Monteiro, P., De Santa Bárbara Narciso., & Pereira Monteiro N. (2013). What is Sexual Satisfaction? Thematic Analysis of Lay People´s Definitions. *The Journal of Sex Research,51*(1), 22-30. doi: 10.1080/00224499.2013.815149

Philippsohn, S., & Hartmann, U. (2009). Determinants of Sexual Satisfaction in a Sample of German Women. The Journal of Sexual Medicine, 6(4), 1001-1010. doi: 10.1111/j.1743-6109.2008.00989.x

Polit, D., & Beck, C. (2017). Nursing research : Generating and assessing evidence for nursing practice (10th ed.). Philadelphia: Wolters Kluwer.

Rosen, R., Brown, C., Heiman, J., Leiblum, S., Meston, C., Shabsigh, R., Ferguson, D., & D'Agostino, R. (2000). The Female Sexual Function Index (FSFI): A multidimensional self-report instrument for the assessment of female sexual function. *Journal of Sex & Marital Therapy*, *26*(2), 191–208. doi: 10.1080/009262300278597

Rosenqvist, L. (2010). Sexuella fantasier. In Lundberg, P O., & Löfgren- Mårtenson, L. (Eds.), *Sexologi* (3. ed., p. 110-114). Stockholm: Liber.

Ross, W. M., Månsson, S. A., Daneback, K., Cooper, A., & Tikkanen, R. (2005). Biases in internet sexual health samples: Comparison of an internet sexuality survey and a national sexualhealth survey in Sweden. *Elsevier, Social Science & Medicine,61*(1),245–252 doi: 10.1016/j.socscimed.2005.01.019

Rowland, D.L., Cempel, L. M., & Tempel, A. R. (2018). Women´s attributions regarding why they have difficult reaching orgasm. *Journal of Sex & Marital Therapy,44*(5). 475-484. doi: 10.1080/0092623X.2017.1408046.

Schmitt, P. D., Shackelford, K. T., Duntley, J., Took, W., Buss, M. D., & Fisher, L. M. (2002). Is there an early-30s peak in female sexual desire? Cross-sectional evidence from the United States and Canada. *The Canadian Journal of Human Sexuality,11*(1), 1-18. http://toddkshackelford.com/downloads/Schmitt-CJHS-2002.pdf

Skoog, I. (2010). Sexualitet hos äldre. In Lundberg, P O., & Löfgren- Mårtenson, L. (Eds.), *Sexologi* (3. ed., p. 101-109). Stockholm: Liber.

Statens offentliga utredningar (2017). Transpersoner i Sverige. Förslag på förstärkt ställning och bättre levnadsvillkor (SOU 2017:92). Stockholm: Elanders Sverige AB

Statistiska centralbyrån (2011:3). Olika generationers barnafödande. Örebro: SCB- Tryck.

Statistiska centralbyrån (2018a). Utbildningsnivån i Sverige. Retrieved 20190305 from https://www.scb.se/hitta-statistik/sverige-i-siffror/utbildning-jobb-och-pengar/utbildningsnivan-i-sverige/

Statistiska centralbyrån (2018b). Andel personer som har tillgång till internet i hemmet. Retrieved from 20190305 from https://www.scb.se/hitta-statistik/statistik-efter-amne/levnadsforhallanden/levnadsforhallanden/befolkningens-it-anvandning/pong/tabell-och-diagram/andel-personer-som-har-tillgang-till-internet-i-hemmet/

Statistiska centralbyrån. (2018 c). Skilsmässor i Sverige. Retrieved 20190124 from https://www.scb.se/hitta-statistik/sverige-i-siffror/manniskorna-i-sverige/skilsmassor-i-sverige/

Statistiska centralbyrån. (n.d). Mödrar och fäder. Retrieved 20190312 from https://www.scb.se/statistik/BE/BE0701/2000I02/BE51ST0207_04.pdf

Sullivan, G. & Artino Jr., A. R. (2013). Analyzing and Interpreting Data From Likert-Type Scales. *Journal of Graduate Medical Education*, *5*(4), 541-542. doi:10.4300/JGME-5-4-18

Svenska barnmorskeförbundet. (2018). *Kompetensbeskrivning för legitimerad barnmorska.* Stockholm: Svenska barnmorskeförbundet.

Tavakol, M. & Dennick, R. (2011). Making sense of Cronbach alpha. *International Journal of Medical Education, 2,* 52-55 doi: 10.5116/ijme.4dfb.8dfd

Tidefors, I. (2010). Anknytning och sexuell utveckling. In Lundberg, P O., & Löfgren-Mårtenson, L. (Eds.), *Sexologi* (3. ed., p. 81-85). Stockholm: Liber.

Trice- Black, S. (2010). Perceptions of Women's Sexuality Within the Context of Motherhood. *The Family Journal: Counseling and Therapy for Couples and Families,18*(2),154-162. doi: 10.1177/1066480710364130

Turner, C. F., Ku, L., Rogers, S.M., Lindberg, L.D., Pleck, J.H., & Sonenstein, F.L. (1998). Adolescent Sexual Behavior, Drug Use, and Violence: Increased Reporting with Computer Survey Technology. *Science*, *280*(5365), 867-873 doi: 10.1126/science.280.5365.867

Vetenskapsrådet (2002). Forskningsetiska principer inom humanistisk-samhällsvetenskaplig forskning. Stockholm: Vetenskapsrådet.

Wendt, E. K., Hildingh, C. I., Lindell, E., Westerståhl, A. K., Baigi, A., & Marklund, B. (2007). Young women's sexual health and their views on dialogue with health professionals. *Obstetrica et Gynecologica Scandinavica 86*(5),590-595. doi: 10.1080/00016340701214035

Wendt, E. K., Lidell, E. A., Westerståhl, A. K., Marklund, B. R., & Hildingh, C. I. (2009). Young women's perceptions of being asked questions about sexuality and sexual abuse: a content analysis. *Midwifery, 27*(2), 250-256. doi: 10.1016/j.midw.2009.06.008

Woolhouse, H., McDonald, E., & Brown, S. (2012). Women's experiences of sex and intimacy after childbirth: making the adjustment of motherhood. *Journal of Psychosomatic Obstetrics & Gynecology,33*(4), 185-190. doi 10.3109/0167482X.2012.720314

World health organization. (2010a). *Developing sexual health programmes.* Geneva: World health organization.

World health organization. (2010b). Defining sexual health. Retrieved 20190118 from https://www.who.int/reproductivehealth/topics/sexual_health/sh_definitions/en/

World health organization. (1948). WHOQOL: Measuring Quality of Life. Retrieved 29190203 from https://www.who.int/healthinfo/survey/whoqol-qualityoflife/en/

Young, M., Denny, G., Young, T., & Luquis, R. R. (2000). Sexual satisfaction among Married Women Age 50 or older. *American Journal of Health studies 16*(2),1107-1122. doi: 10.1177/003329410008600307.2

Yuen Loke, A. (2013). Editorial: Sexual Health: An integral part of our health and quality of life. *Journal of clinical nursing, 22*(23-24), 3239-3239. doi:10.1111/jocn.12510

Attachments

Appendix 1: Information letter and consent form

Karolinska Institutet

A survey study of people who have a vulva and vagina, and their perception of genital sexual function

This study's aim is to investigate how people with a vulva (inner, outer labia and clitoris) and vagina experience the sexual function of their genitals and how well they know the genitals physiology.

The survey takes about 10 minutes to complete.

Sexual function and dysfunction are well-researched areas, especially regarding people with a penis, and today there is a lot of knowledge about the function of the genitals. Anatomically and physiologically there are many similarities between the functions you find in a penis as with the functions in vulva (inner, outer labia and clitoris), yet studies suggest that people with vulva are not as aware of these functions as people with penis are about their genital functions.

We are two midwifery students from Karolinska Institutet at the Department of Women and Children's Health in Sweden who intend to investigate this topic more closely by conducting an online survey. This will be the basis for our masters thesis and the results may be presented outside Karolinska Institutet. Only group-level results will be presented, i.e. no individual's survey will be presented.

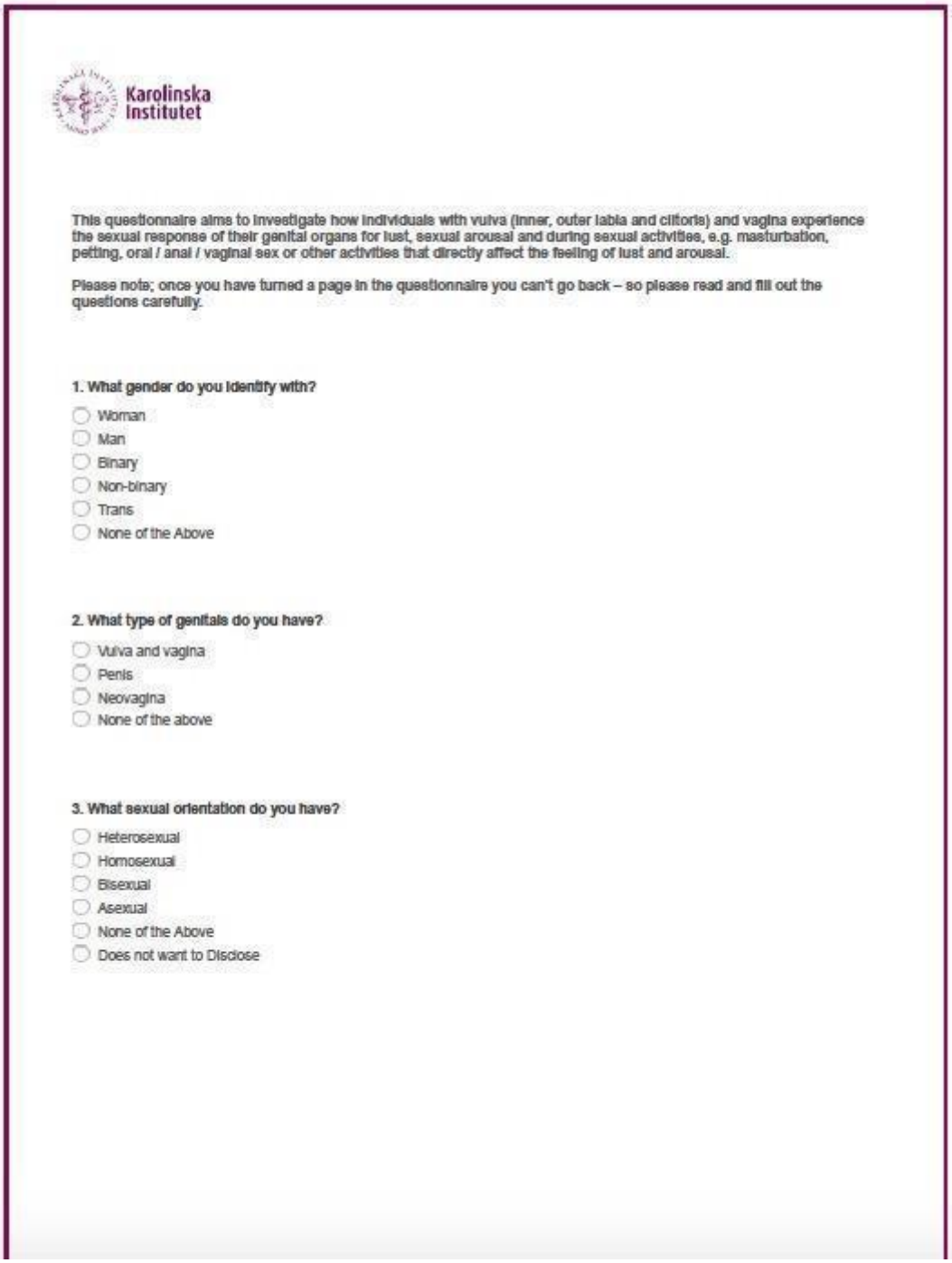
We want to acknowledge the following:
- **Participation in the study is completely voluntary**
- **Participation is completely anonymous and the answers cannot be traced back to you in any way**
- **Submitted questionnaires is equivalent to giving consent to participation in the study**

If you have any questions about the study, please feel free to contact us.

Antonia Nordin
Midwifery Student, Karolinska Institutet
antonia.nordin@stud.ki.se

Jenny Hedlöf
Midwifery Student, Karolinska Institutet
jenny.hedlof@stud.ki.se

Appendix 2: Online survey



Karolinska Institutet

This questionnaire aims to investigate how individuals with vulva (inner, outer labia and clitoris) and vagina experience the sexual response of their genital organs for lust, sexual arousal and during sexual activities, e.g. masturbation, petting, oral / anal / vaginal sex or other activities that directly affect the feeling of lust and arousal.

Please note; once you have turned a page in the questionnaire you can't go back – so please read and fill out the questions carefully.

1. What gender do you identify with?

- Woman
- Man
- Binary
- Non-binary
- Trans
- None of the Above

2. What type of genitals do you have?

- Vulva and vagina
- Penis
- Neovagina
- None of the above

3. What sexual orientation do you have?

- Heterosexual
- Homosexual
- Bisexual
- Asexual
- None of the Above
- Does not want to Disclose

Karolinska Institutet

4. How old are you?

- ○ under 20
- ○ 20-24
- ○ 25-29
- ○ 30-34
- ○ 35-39
- ○ 40-44
- ○ 45-49
- ○ 50-54
- ○ 55-59
- ○ 60 or more

5. What is your highest level of education?

- ○ Elementary School
- ○ High School
- ○ College/University

6. What is your current employment?

- ☐ Student
- ☐ Working full time
- ☐ Working part time
- ☐ Unemployed
- ☐ Sick Leave
- ☐ Retired

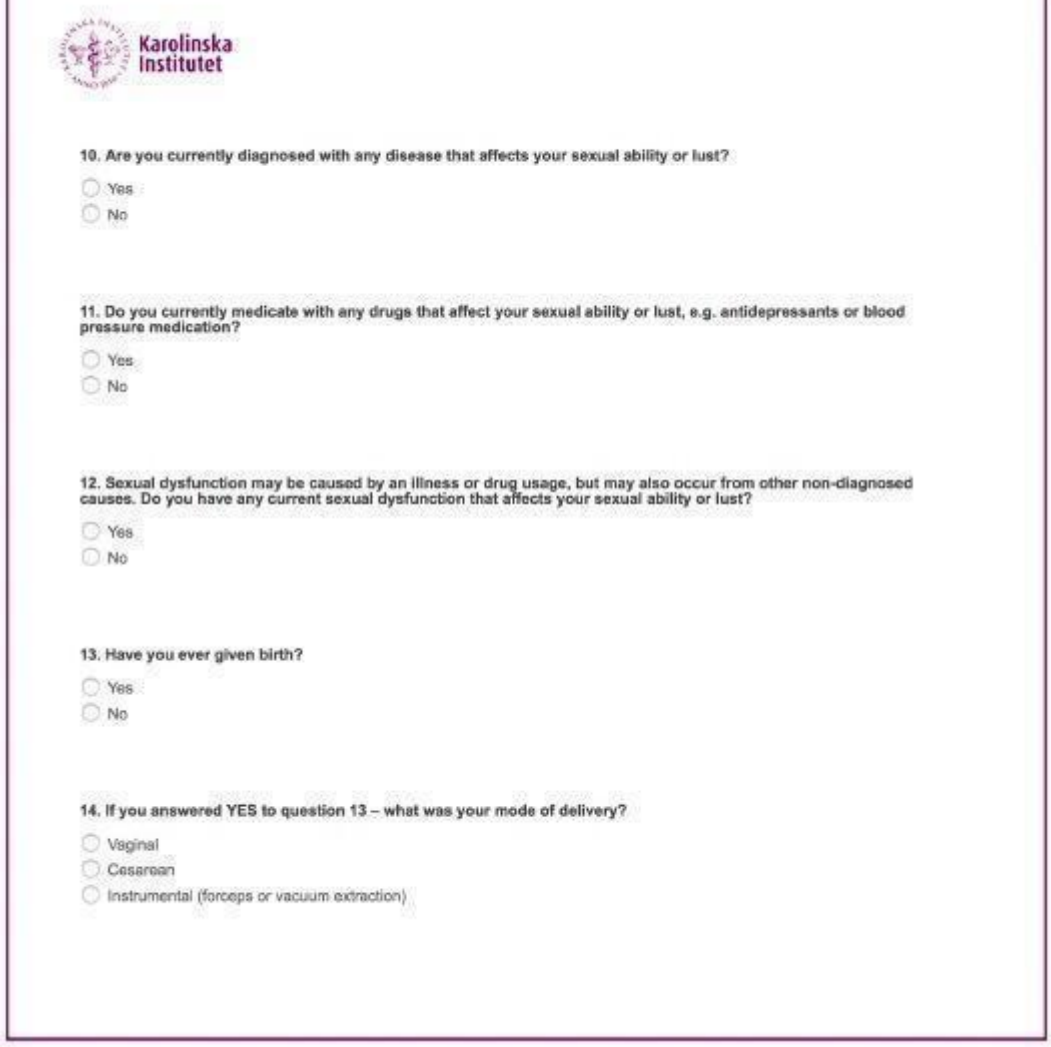
7. What is your marital status?

- ○ Single
- ○ Steady Partner(s)
- ○ Cohabiting/Civil Partnership
- ○ Married

8. In which country were you born?

9. How long have you lived in Sweden

- ○ Less than 1 year
- ○ 1-2
- ○ 3-4
- ○ 5-6
- ○ 7 or more years
- ○ Whole Life



Karolinska Institutet

10. Are you currently diagnosed with any disease that affects your sexual ability or lust?

- Yes
- No

11. Do you currently medicate with any drugs that affect your sexual ability or lust, e.g. antidepressants or blood pressure medication?

- Yes
- No

12. Sexual dysfunction may be caused by an illness or drug usage, but may also occur from other non-diagnosed causes. Do you have any current sexual dysfunction that affects your sexual ability or lust?

- Yes
- No

13. Have you ever given birth?

- Yes
- No

14. If you answered YES to question 13 – what was your mode of delivery?

- Vaginal
- Cesarean
- Instrumental (forceps or vacuum extraction)

Karolinska Institutet

The following section asks a series of personal questions about how your genitals react in different emotional states, such as feeling lust, sexual arousal and during sexual activities, e.g. masturbation, petting, oral / anal / vaginal sex. This section also asks questions about your sexual habits and activities.

15. How often do you masturbate?

- ○ At least once a day
- ○ At least once a week
- ○ 1-4 times per month
- ○ Less than once a month
- ○ At least once per year
- ○ Never

16. How often do you have sex with one or more people?

- ○ At least once a day
- ○ At least once a week
- ○ 1-4 times per month
- ○ Less than once a month
- ○ At least once per year
- ○ Never

17. Have you ever experienced an orgasm?

- ○ Yes
- ○ No

18. If so, how often do you orgasm?

- ○ At least once a day
- ○ At least once a week
- ○ 1-4 times per month
- ○ Less than once a month
- ○ At least once a year
- ○ Never

Karolinska Institutet

Answer the following statements by ticking the box that best suits you, where 1 is "completely disagree" and 7 is "completely agree".

19. Answer the following statements by ticking the box that best suits you, where 1 is "completely disagree" and 7 is "completely agree".

	1 Completely Disagree	2	3	4	5	6	7 Completely Agree
I consider myself a sexual person	○	○	○	○	○	○	○
I orgasm easily when masturbating	○	○	○	○	○	○	○
I orgasm easily when I have sex with one or more people	○	○	○	○	○	○	○
I'm satisfied with my sex life	○	○	○	○	○	○	○

20. I feel a distinct reaction in my genitals .... (1 is "not correct at all" and 7 are "completely correct")

	1 Not correct at all	2	3	4	5	6	7 completely correct
when I feel lust	○	○	○	○	○	○	○
when I feel sexually aroused	○	○	○	○	○	○	○
during sexual activity	○	○	○	○	○	○	○

21. I can feel my genitals swelling ...(1 is "not correct at all" and 7 are "completely correct")

	1 Not correct at all	2	3	4	5	6	7 Completely correct
when I feel lust	○	○	○	○	○	○	○
when I feel sexually aroused	○	○	○	○	○	○	○
during sexual activity	○	○	○	○	○	○	○

Karolinska Institutet

Continuation of how your body works. Answer the following statements by choosing a number from 1 to 7, where 1 is not at all and 7 is intensely.

22. How intensely do you experience your genitals getting wet...

	1 Not correct at all	2	3	4	5	6	7 Intensely
when I feel lust	○	○	○	○	○	○	○
when I feel sexually aroused	○	○	○	○	○	○	○
during sexual activity	○	○	○	○	○	○	○

23. How intensely do you experience swelling in your genitals...

	1 Not correct at all	2	3	4	5	6	7 Intensely
when I feel lust	○	○	○	○	○	○	○
when I feel sexually aroused	○	○	○	○	○	○	○
during sexual activity	○	○	○	○	○	○	○

24. How intensely do you experience a pulsation / throbbing feeling in your genitals...

	1 Not correct at all	2	3	4	5	6	7 Intensely
when I feel lust	○	○	○	○	○	○	○
when I feel sexually aroused	○	○	○	○	○	○	○
during sexual activity	○	○	○	○	○	○	○

25. How intensely do experience tingling / tickling in your genitals...

	1 Not correct at all	2	3	4	5	6	7 Intensely
when I feel lust	○	○	○	○	○	○	○
when I feel sexually aroused	○	○	○	○	○	○	○
during sexual activity	○	○	○	○	○	○	○

Karolinska Institutet

26. An orgasm can be experienced differently from time to time and depending on your situation, e.g. when masturbating or during sex. With this question, we are curious about how you experience your typical orgasm.

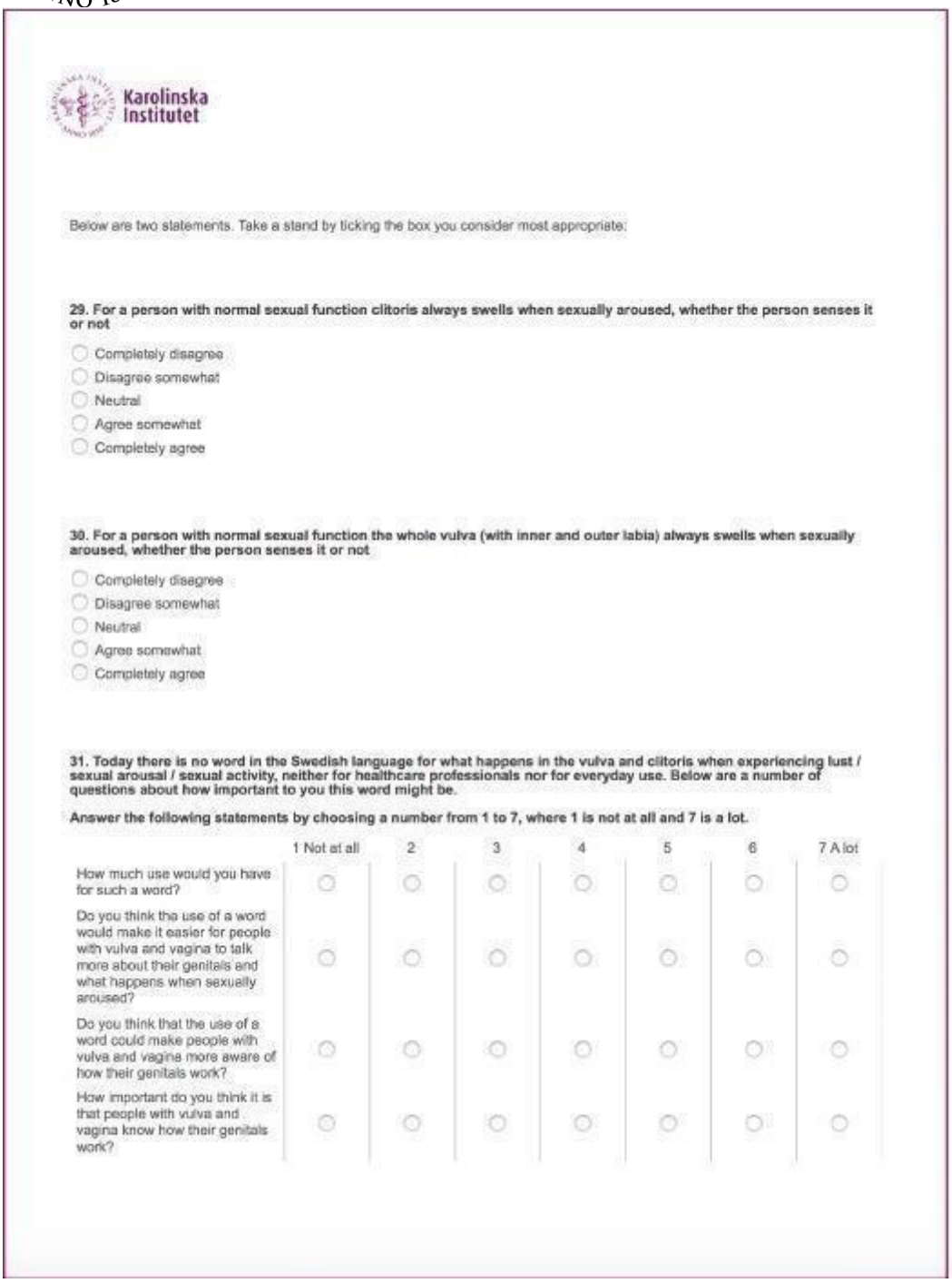
	1 Not correct at all	2	3	4	5	6	7 Intensely
How intense do you experience your typical orgasm?	○	○	○	○	○	○	○

27. Answer the following statements by choosing a number from 1 to 7 where 1 is none and 7 is a lot.

	1 None	2	3	4	5	6	7 A lot
How much knowledge do you have about how the vulva and vagina work?	○	○	○	○	○	○	○

28. How do you experience your genitals sexual response?

Describe in your own words the feelings you get in your genital organs when experiencing lust or sexual arousal



Karolinska Institutet

Below are two statements. Take a stand by ticking the box you consider most appropriate:

29. For a person with normal sexual function clitoris always swells when sexually aroused, whether the person senses it or not

- Completely disagree
- Disagree somewhat
- Neutral
- Agree somewhat
- Completely agree

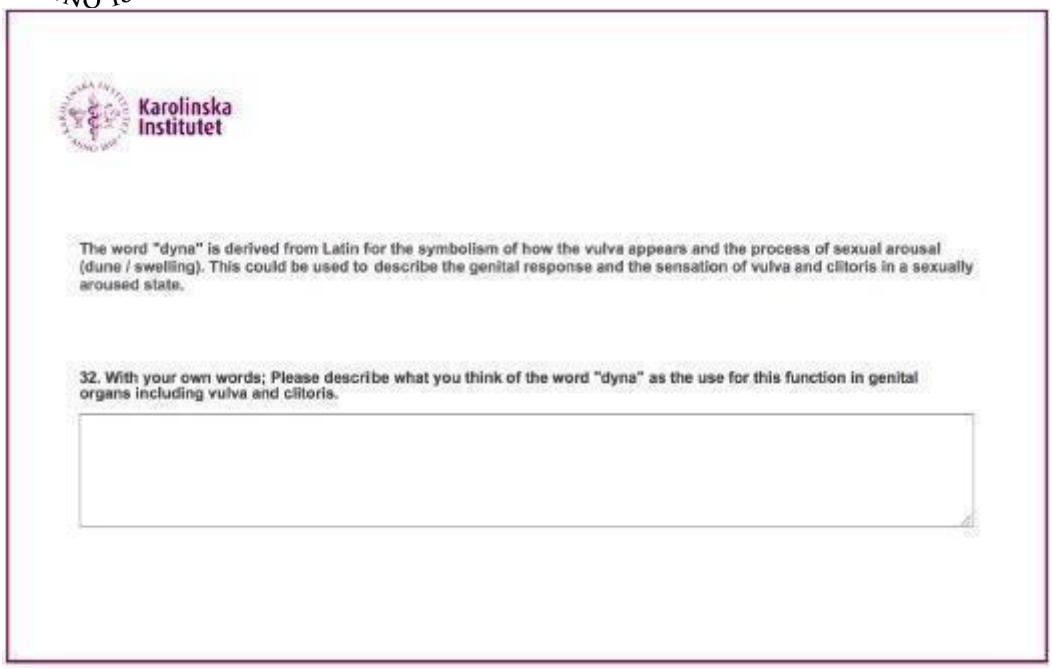
30. For a person with normal sexual function the whole vulva (with inner and outer labia) always swells when sexually aroused, whether the person senses it or not

- Completely disagree
- Disagree somewhat
- Neutral
- Agree somewhat
- Completely agree

31. Today there is no word in the Swedish language for what happens in the vulva and clitoris when experiencing lust / sexual arousal / sexual activity, neither for healthcare professionals nor for everyday use. Below are a number of questions about how important to you this word might be.

Answer the following statements by choosing a number from 1 to 7, where 1 is not at all and 7 is a lot.

	1 Not at all	2	3	4	5	6	7 A lot
How much use would you have for such a word?	○	○	○	○	○	○	○
Do you think the use of a word would make it easier for people with vulva and vagina to talk more about their genitals and what happens when sexually aroused?	○	○	○	○	○	○	○
Do you think that the use of a word could make people with vulva and vagina more aware of how their genitals work?	○	○	○	○	○	○	○
How important do you think it is that people with vulva and vagina know how their genitals work?	○	○	○	○	○	○	○


Karolinska Institutet
The word "dyna" is derived from Latin for the symbolism of how the vulva appears and the process of sexual arousal (dune / swelling). This could be used to describe the genital response and the sensation of vulva and clitoris in a sexually aroused state.
32. With your own words; Please describe what you think of the word "dyna" as the use for this function in genital organs including vulva and clitoris.