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Edited by Dhastagir Sultan Sheriff

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Meet the editor

Dhastagir Sultan Sheriff is a member of the European Society for Human Reproduction and Early Human Development, the Association of Physiologists and Pharmacologists of India, and the National Academy of Medical Sciences, New Delhi. He is also a resource person for UNESCO. Dr. Sheriff has authored five books including a textbook on medical biochemistry with additional interest in human sexology. He has published editorials in the *British Journal of Sexology, Journal of Royal Society of Medicine, Postgraduate Medicine,* and *Scientist*. He was a former Rotarian, Citizen Ambassador, and was selected for the Ford Foundation Fellowship.

Contents

Preface

Human sexuality encompasses many domains, including biological, social, and psychological domains. The sexual response cycle involves different phases, including excitement, plateau, orgasm, and resolution. Sex is mostly linked to procreation. In many countries, marriage is the avenue toward fulfilling sexual desire and expression. Human sexuality deals with sensuality, intimacy, identity, behavior, reproduction, and sexualization. Sensuality encompasses sensual pleasures, intimacy means being close in mind and thought, and identity includes gender identity. Sexualization refers to objectification to derive physical pleasure. Each of these is a facet of human sexuality. Understanding these various aspects of human sexuality is essential for healthy sexuality. Human sexuality depends on the normal anatomy of reproductive organs, their physiological functions, and their regulation, including their development. Any anatomical anomalies of reproductive organs or their development may cause physical and psychological effects on normal human sexual function. Defects in early human development influence the physical development of reproductive organs and their functions. Genetic variations including genetic defects can lead to developmental disorders like Klinefelter syndrome, a condition in boys and men that can affect physical and intellectual development. The hormones follitropin, lutropin, prolactin, estrogen, and androgen play a key role in human sexuality. Any defects in these hormones impair human sexual functions. Therefore, normal human sexuality depends on proper genetic composition, normal development from the gonadal stage to being a sexually active adult, proper anatomical location of accessory sex organs, and a normal hormonal milieu. Non-communicable diseases like diabetes mellitus and certain drug therapies like statins can also impair normal human sexual life. Breast cancer and negative feelings regarding body image affect the human sexual activity and therefore quality of life.

This book describes the different facets of human sexuality and its importance in human health. The book deals with the origins of human sexuality, sex development, gender, sexual health, sexuality, and disability. The book also gives a bird's eye view of how the COVID-19 pandemic affected human sexuality.

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Section 1

Introduction to Human Sexuality

Chapter 1

Introductory Chapter: Human Sexuality during COVID-19 Pandemic

Dhastagir Sultan Sheriff

1. Introduction

Human sexuality and physical well-being involve multiple dimensions of biological, social, and cultural interactions. Sexual relationships and right to choose one's partner vary from country to country, culture, religion, and the community we live in. Countries like India though there is a great transformation with regard to sex and sexuality, still it is linked to marriage, procreation, parental consent, and even celestial matching of horoscope [1].

Every individual has the right to choose the partner and type of sexual activity and express one's sexual desire.

2. Sexual expression

The right to have sexual pleasure lies in defining what sexual pleasure is? Sexual desire is not confined to seeking pleasure. It may be for having a baby and for comfort. Sexual desire is not confined to sexual pleasure. People can have sex from nonsexual motives including commercial sexual activities. Social distancing and lockdown during COVID-19 may infringe on the individual rights (autonomy) but needs to be balanced with social responsibility [2, 3].

3. Sexual harm and right to protection

Many women engage in *consensual* sex but motivated by nonsexual desires including pleasing the partner or as commercial sexual activity. The extreme form of harm is the growing cases of rape of all age groups. This objection is true in that harmful sex gives the participants a reason not engage in it, although it cannot be used to argue that social or legal forces should prevent this action [4].

4. COVID-19 and abuse of children

There is UN human rights experts report that there is an increase in violence against children and sexual exploitation during COVID-19 lockdown [5].

One needs to protect low-income and vulnerable communities and families to minimize COVID-19-induced harm on children. There has to be public awareness program and campaigns, helpline services, safe accommodation, and child protection system in place to reduce harm.

5. COVID 19 and AIDS patients

"COVID-19 is impacting almost every country and community, but the global HIV epidemic hasn't gone away," said Winnie Byanyima, UNAIDS Executive Director. "People are still having sex. People are still using drugs. During the COVID-19 pandemic, everyone must be given the tools they need to be safe and to protect themselves from HIV. Human rights are a cornerstone of HIV prevention and must be a cornerstone of the COVID-19 response" [6].

United Nations AID organization warns that one need to prevent increase in new HIV cases and has released documents as how to tackle the situation in COVID-19 pandemic. Overstretched health systems, lockdowns, loss of livelihoods, and fewer employment opportunities could increase unprotected sex, sexual violence and exploitation, transactional sex, and sex work, leading to an increase in new HIV infections.

During the pandemic, teleconsultation or remote consultation to HIV patients may help to provide diagnostic or therapeutic advice through electronic media. Self-testing for HIV will reduce physical contact with other people and help reduce the burden on health services [6].

6. Dalit women and human rights including sexual rights

There are 100 million Dalit women in India and most of them live in rural areas. They face oppression, social exclusion, and sexual abuse from their own community and from upper class.

Dalit women are considered to be intrinsically impure and "untouchable." Violence and inhuman treatment such as sexual assault, rape, and naked parading are common and serve as a social mechanism to maintain Dalit women's subordinate position in society.

Dalits in India are known as scheduled caste and are not protected against social discrimination and social exclusion despite a constitutional ban on "untouchability," and the enactment of specific legislations including the Protection of Civil Rights (PCR) Act, 1955 and the Scheduled Castes and Scheduled Tribes (Prevention of Atrocities) Act, 1989 [7].

In the name of containing community transmission of the novel coronavirus, Dalits are being prevented from using main streets and roads. Such incidents bring back the despicable memories of untouchability, wherein Dalits were not allowed to even enter villages [8, 9].

Objectification of women reduces human dignity and autonomy and lowers women to a lower level. Clear cases of sexual objectification include sexually motivated rape and violence [10].

Sex has intrinsic value and sexual pleasure as sensation or enjoyment often may result in drastic consequences. Sex therefore needs to be balanced protecting women's sexual rights.

Sexuo-erotic orientation which has defined sexual relationships as heterosexual, homosexual, and transgender has their own perspective and rights that society needs to respect, and social stigma may hinder access to health service in such a pandemic. Sexual exploitation, abuse, and sexual harassment violate human rights and are a betrayal of the core values of the United Nations. These rights need to be protected and safeguarded [11, 12].

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Section 2

The Origin of Human Sexuality

Chapter 2

The Strangeness and Origins of Human Sexuality

Nikolai S. Rozov

Abstract

This chapter focuses on critical problems of the nature and genesis of human sexuality: the classic concept of different sexual strategies of men and women, primordiality and naturalness of monogamy, the disinterestedness of women in sex, evolutionary "side effect" of female orgasm. We present and discuss inescapability of adultery, the diversity of sexual relations in pre-state societies, the revealed mechanisms of competition and selectivity in the anatomy and physiology of male and female reproductive organs. The modern versions of the adaptive significance, functions of the female orgasm deserve particular attention. Neither "egoistic" explanations (retention of a partner and "hunting" for good genes) nor esthetic ones (self-value of pleasure) are sufficient. The evolutionary hypothesis explains the genesis of emotional and sexual syncretism in women and the "cleavage" (dualism) of male sexuality. Women's feelings toward men come from girls' love and commitment to fathers and older men as protectors. Their feelings toward mothers remain intact: close relationships and at least partial identification with mothers remain in the majority. In boys, the original love for mothers inevitably suffers a crisis both in phylogeny through sexual selection, masculine culture, and in ontogeny through negative reinforcement.

Keywords: sexuality, sexual strategies, evolution of sexuality, paleopsychology, female orgasm, "sperm war," primate sexuality, sex differences, human reproductive system, psychology of love

1. Introduction

It is hardly necessary to prove the enormous importance of gender relations, sexuality, and the inseparable spheres of kinship and inheritance. However, despite the enormous amount of research in this field, especially over the last 40–50 years, some questions that seem simple, even ridiculous, have not received a universally recognized answer, and researchers did not reach a consensus. Here are just a few of the questions.

- Why does adultery, not only on the part of men but also on women, persist despite centuries of moral, religious, customary, and state law systems, despite significant risks?

- If the female orgasm is not a by-product of the evolution of the male orgasm (as everyone has already agreed), what function does it serve? Why does it not always happen and not in all women?

- How can we explain such an apparent difference between the usual integrity, syncretism of women's feelings and splitting, disconnectedness of feelings in men?

2. Sexual strategies and primordial monogamy: the dubiousness of the classical model

Sexual strategies are adaptive solutions to the task of finding a match. In such terms, D. Symons [1] described and explained the difference between these strategies. A woman invests much more energy, time, and attention in carrying and raising each child, so she is interested in a long-term relationship with a man who will take care of her and the children, protect and provide resources. The man's contribution is much more modest, so he is interested in spreading his genes as widely as possible and is prone to many short-term relationships with different women. The same concept assumes a low libido level in women, their firm attitude to monogamous marriage [ibid]. In this paradigm, a man offers food, valuable things, protection, and status in exchange for exclusive and permanent sexual access. It is considered as a fundamental "sexual contract" too [2, 3]. Researchers have assembled an extensive and impressive list of arguments that contradict the main points of this almost classical concept [4, 5].

3. The diversity of sexual orders and strange ideas of partial paternity

The monogamous marriage we are accustomed to, and the strict condemnation of adultery are by no means so widespread when we consider societies outside the most numerous nations. In many societies, extramarital sex was allowed for specific categories, such as between brothers and daughters-in-law (Siriono in eastern Bolivia).

> *"These people were "monogamous," but men were permitted to have sexual intercourse with their wife's sisters and with their brothers' wives. Women, in turn, could have sex with their husband's brothers and their sisters' husbands. Among the Haida tribe, married men and women were generally permitted sexual relations with anyone belonging to the spouse's clan; at most, the husband or wife could "object softly." Usually, he or she did not" ([4], p. 148).*

Among the most diverse cultures of the savage level (hunter-gatherer, not converted to agriculture, usually egalitarian), the belief that a pregnant woman should continue intercourse for the full development of the fetus, and preferably with different men, is rather characteristic ([6, 7]; p. 10).

4. What do the earliest signals of erotic attraction?

Let us pay attention to the following points, which usually escape from attention when analyzing such a "simple" subject as a female erotic attraction. First, women's inviting bodily "ornaments" appeared much earlier than any clothes, probably

together with the loss of body hair. It means that they were visible to everyone around them, including men, to whom they directed these signals. Secondly, girls and women usually like dances, singing, facial expressions, costumes, headdresses, jewelry, and aim them at the public. If women are not wrapped in deaf sacks and kept locked up, the propensity for all this behavioral and material adornment of the self does not disappear even after marriage, when there is no need to compete for the most attractive suitors. If women were programmed to please only one man from ancient times, their main passion would be some bodily practice like stroking or massaging their partner. It does happen, but it is nothing compared to women's passion for adornment, dancing, and coquetry in public.

When we extrapolate all these points to groups of our most distant ancestors, we get the idea of a pretty egalitarian community with no or very little control over women's behavior who seduce the men around them with their physical beauty and adornment grace.

Alas, women also commit adultery [8, 9]. If the ease and profitability of widespread genes in men are enough to explain their more frivolous behavior (or desires, at least), why do women have sex with new partners? Some experts think women may benefit indirectly through superior offspring born from an extramarital affair, or they may benefit directly, receiving material benefits from the lover both for themselves and their children ([4], p. 59). Let us add to this women's need for love, for emotional commitment to a man [10].

Whom do they choose? What makes up the erotic appeal of men? A strong, beautiful male body, men's rhetorical abilities ("women love with their ears"), as well as their confidence, dominant behavior, the visible prestige of power, wealth, fame, or intelligence (depending on the social and cultural environment), are "read" by women on a subconscious level as features of sexual attraction [11].

Men have their ways of competing for attention: these are all kinds of contests in strength, agility, the height of jumping, good luck in hunting, in games imitating chasing, hunting, or fighting with enemies. Note that all these traits are also public, and men do not lose interest in such activities and rivalries after choosing a bride and getting married.

5. The oddities of male "rigging"

The usual and seemingly natural often becomes a bundle of oddities. Many researchers interpret unusual features in the structure of human reproductive organs quite unequivocally — as anatomical traces of former fierce competition of cavaliers for fertilization. The main battlefield was not fights of individuals before copulation, but large-scale "battles" between millions of sperm of two and more cavaliers after multiple sexual intercourses with one woman [4, 12–15]. Here is a list of the main arguments.

- The size of male testicles, on the one hand, indicates the predisposition of our distant ancestors (800–200,000 years ago, kya) to frequent coitus with different females (as male chimpanzees and bonobos do), but it does not reach the size of their testicles, because the human ones decreased during the transition to polygamy and monogamy (10–5 kya).

- The human penis, with its particular thickness and extra thickening of the head in humans, is designed to remove the preceding sperm.

- Male *"turbogenitalia"* with "impressive firepower of sperm," with abundant ejaculations, less frequent than in chimpanzees and bonobos, but more voluminous, are helpful only if designed to win such rivalry. Otherwise (for simple fertilization), they are entirely unnecessary.

- The hazardous location of the testicles in the vulnerable outer scrotum can have only one evolutionary explanation: a chilled portion of semen must be on hand at all times, which implies a regime of frequent unplanned copulations, in all likelihood with different ladies.

6. Reproductive mechanisms as military technology: why is it so complicated?

For several decades now, the *"sperm war"* has been a hot topic in studying human sexuality [7, 12, 14]. Ejaculation usually takes place in several thrusts. Scientists have managed to isolate their contents and analyze them. In the beginning, it turned out that along with a portion of sperm, substances that protect against chemical attacks are injected. The thing is that for a woman's organism, spermatozoa are alien bodies — antigens, particular leukocytes, the number of which exceeds the number of spermatozoa by 100 times or more, are directed to their destruction [13, 16].

Besides, the substances of the first ejection protect from substances from the past ejections of other men. They also have their antidote — spermacids, which slow down the movement of new alien spermatozoa. Besides the "normal" spermatozoa, which look for eggs to fertilize, there are others. These "warriors" look for and destroy foreign spermatozoa if they are present in the woman's genital tract. Thus, the sperm's chemical and microbiological ammunition is designed to defend itself and attack the enemy [12, 17].

In all this, the woman's body does not remain a passive "battlefield." During the contraction of the vagina, the semen of one man can be expelled, while the semen of the other man will be retracted. With its chemical environment, leukocytes, anatomical and physiological barriers in the vagina, cervix, and on the surface of the egg itself, the female body creates obstacles for most spermatozoa, but it helps a select few [4].

The complex structure of the cervix indicates that it has evolved to filter, temporarily storing sperm, and from different cavaliers. As a result, the egg captures not any spermatozoa but those with "suitable" characteristics [14, 15]. Therefore, females can benefit from comparing many males without intercourse with the same *"high-quality"* partner [18].

7. The female orgasm: atavism or valuable evolutionary gain?

A critical component of the classical concept of the "naturalness" of monogamy and women's "low interest" in sex was the treatment of the female orgasm as an optional and not particularly necessary by-product of the male orgasm, just as nipples in men are useless, but not a hindrance either [1, 19]. This version occurred to be wrong as it has faced strong arguments against "sidedness" [4]:

- the female orgasm is mighty and vivid, and in all aspects (muscular contractions, hormonal, and nervous, psychophysiological processes), subjectively impressive and meaningful for women;

- the complex arrangement of this phenomenon involves a long and sophisticated evolutionary adjustment;

- the head of the clitoris has a huge number of nerve endings (over 8000), more than anywhere else on the human body, twice as many as in the very sensitive head of the penis; and the only function of the clitoris is sexual sensation and orgasm;

- orgasm does not occur in all women, and even those who experience it do not consistently achieve it; there is a selectivity here, an influence of circumstances, which again is in no way consistent with *"collateralism."*

We will not discuss primitive and erroneous versions of the functionality of the female orgasm (luring women to have sex, facilitating fertilization through muscular contractions or horizontal posture).

The most plausible versions are those based on the idea of such an essential female concern as choosing the best partner for marriage and parenthood. It is the already classic theory of emotionally "tying down" a partner and then fathering one's children so that in a "daddy at home" situation, they can grow up more nourished, safe, and successful [7].

The following points do not fit into this concept.

- There is a strange dissonance between how long it takes a woman to "warm-up" and how quickly men cool down after they have achieved it.

- Loud, often uncontrolled female cries at orgasm; such sounds (moans, loud breathing, growling) excite men no less, and often even more than the sight of a naked female body; this testifies to a well-organized "signal/reaction" pair, which has all signs of innateness, universality and, therefore, is a trace of a very ancient evolutionary adaptation.

- Such sounds made by female primates during copulation serve to arouse and attract other males [20]; female primates practicing promiscuity make more complex, intricate sounds during copulation than females of monogamy or harem species [15, 21].

- Males are particularly aroused by scenes that have an explicit relation to sperm competition; photos and videos of one woman and several men are much more popular on the Internet and in commercial pornography than one man's contact with multiple women [22].

- The complex mechanisms of female postcopulatory selectivity of semen from different men in the genital tract. It turns out that during orgasm, there is a change in acidity in the vaginal environment, which probably helps the spermatozoa of the man who brought the woman to orgasm to survive and reach their target.

- In this respect, female vocalization during coitus gets the function (unconsciously, of course) of a potential invitation: "Come here, take part in the competition for the reproductive prize!"

Such, to put it bluntly, scandalous behavior in contemporary societies and known history occurs only in the situation of orgies — rare, closed, and, as a rule, morally reprehensible, forbidden group practices. The overwhelming number of sexual acts

and orgasms do occur in situations of solitude. The involuntary sounds at the apex of orgasm have lost their calling function. However, they have neither disappeared, nor has the orgasm itself. Hence, a reasonable assumption follows: this structure began to provide a different kind of care, namely choosing and holding the best partner. To use a metaphor, one can say that the body of a woman, through the highest degrees of pleasure and emotional experience, sends a signal to the brain: "This is whom I want!" [4].

By the way, it is no coincidence that the involuntary and optional nature of the female orgasm has its analogy in the involuntary and optional nature of male arousal and erection. In the same way, the penis sends a signal to the male brain: "I want it now!" The same principle of selectivity applies here, though in a different register. An orgasm, undoubtedly, is a powerful positive reinforcement of the love and sexual connection with this very man (further, we will talk about the syncretism of female sexuality). All this complex of feelings and desires is activated and concentrated on the partner who delivered extraordinary pleasure.

According to a well-meaning model of the "naturalness" of monogamy, we could say that it is always about the groom, the legitimate spouse, and the father of future children. However, even here, it is not simple. Given that women are almost twice as likely to have orgasms with their lovers as with their husbands. Thus, orgasm is accompanied by high retention of sperm (within two minutes after a male orgasm) [10, 11].

A female orgasm serves both to select a partner with the best (most suitable) genes and strengthen the couple. Orgasm promotes conception during the period of maximum fertility with the gene-optimal partner and strengthens the relationship with the permanent partner (spouse) through an increase in oxytocin levels outside of this fertile window period. It is just when special attention and experience by the man are required to induce orgasm in the woman. Accordingly, women of different types share the importance and weight of these functions. For the "unfaithful," practicing a short-term mating strategy, orgasm promotes fertilization and perception of the best genes of the chosen one. For "faithful" women, deprived of the chance to benefit reproductively from extramarital sex, orgasm serves to strengthen the bond with a permanent partner (spouse) [23].

There is another original concept that rejects the purely biological ("good genes") and mercantile ("resources from a partner for oneself and children") adaptive meanings of the female orgasm. Instead, R. Prum believes that women's orgasm reproduces in generations as a self-valued pleasure and coevolves with men's ability to deliver it.

> *"In the Pleasure Happens mechanism, we must focus on the coevolution of the subjective experience of pleasure with the attributes that produce that pleasure. It means recognizing that the pleasurable experience of mate choice itself is still rarely recognized in the scientific literature" ([24], p. 180).*

The usual criticism of this concept for its superficiality does not mean that the more profound reasons must necessarily be biological or self-serving. An essential characteristic of the female orgasm is its solid emotional intensity, connected with feelings of love and commitment to the partner. A woman's violent manifestation of pleasure usually does not leave her partner indifferent (if he is capable of any feelings at all). On the contrary, this lure works for both: one wants more and more. However, there are no guarantees. Not every man can be attracted to it, not every spouse can be discouraged from left thoughts, but female orgasm is one of the most robust means of excitement and strengthening mutual feelings in the partner, often exceeding daily feeding of tasty food.

The female orgasm is not firmly attached to feelings of love and commitment: not every time a woman experiences it in coitus with her beloved partner, and sometimes

she can get such pleasure with an attractive man even in a one-time encounter. However, the connection between feeling and orgasm in women is stronger and more frequent than in men. R. Prum uses the concept of "pleasure," but it is correct to speak of all-absorbing delight, ecstasy, joy, and happiness. A woman's sense of love and commitment to her partner increases the likelihood of orgasm, and each orgasm with him reinforces that feeling. The feedbacks and signals "from body to brain" and "from brain to body" are enhanced here.

Is it necessary to explain why emotionally, psychophysiologically, and sexually satisfied, in other words, happy and confident women and their offspring, get advantages in sexual selection? I will point only to such characteristics as attractiveness, friendliness, non-conflict, and a high level of social membership. Already this, far from complete, list of advantages is enough to explain the development and reproduction of women's ability to experience orgasm with the person they love.

Is this, relatively standard for evolutionary biology, a sufficient explanation? Why do not women gain the ability to imitate orgasm with the same beneficial effect, but without so much energy expenditure? By the way, many do. However, for some reason, women's ability to orgasm does not diminish, even on the contrary. There is something mysterious and disinterested in this, which requires an independent explanation and comprehension.

8. Female syncretism and male duality

In women, erotic, sexual attraction is usually inextricably linked with emotional commitment, encompassing personality and imagination, mind, attention, and memory. On the other hand, erotic and sexual attraction in men is closely linked to visual perception and imagination but is often weakly coupled with other cognitive functions, including intellectual and value spheres.

Let us call these features of sexuality female syncretism and male duality. The problem is that they are used to explain many things while they have no evolutionary explanation.

Note that the primates closest to humans do not have such a pronounced difference. The stability of gibbons' pairs suggests that both males and females are "soul and body" committed to each other, i.e., both are similar to the most faithful and loving woman. It is doubtful that our distant ancestors were similar to gibbons in this respect, but even in such an unlikely case, there is no way to explain why men have lost such an admirable quality.

Among the chimpanzees and bonobos closest to us in sexual behavior, our male type, or rather the "lower" half of it, is characteristic for males and females with a fair amount of levity regarding the early satisfaction of their needs. All this suggests that the key to the explanation is the complex phenomenon of female syncretism, whereas the absence or rejection in males would be easier to explain.

What could be the original form, the source of the fantastic and all-encompassing female love, the fusion of the emotions of commitment, eroticism, and sexual attraction?

9. The key to female happiness

In keeping with the Freudian tradition, let us turn to childhood. What can we surmise about the feelings of little boys and girls in the distant ages of the rare

hunter-gatherer groups, surrounded by all kinds of risks, threats, calamities from predators and strangers, natural disasters, cold, and hunger?

On the one hand, probably the strongest were fear and anxiety, fear of being left alone, and on the other hand, joy and contentment, intense experiences of happiness to be again under the protection of relatives and friends. This pendulum of fear of being left alone and happiness of being protected serves as a basis for forming emotional complexes aimed at mom, dad, and other relatives — protectors.

For the youngest, the mother provided the comfort of protection, as it still is today. In large groups living together, aunts, older sisters, grandmothers play the same role [25]. Boys and girls, as they grow up, understand and feel that the father still provides the principal protection (also with his brothers and companions). For the most part, girls remain emotionally committed to their mothers and imitate them, often inheriting patterns of their relationships with men. However, then, in girls and women, there is a crucial transformation of feelings: they transfer filial love, commitment to the father (or close adult male protectors) to peers — guys, young men, men — as objects of love, erotic and then sexual attraction. It is evidenced by the well-known acuteness and intolerability of female trauma when a loved one leaves — the fear of being left alone, without protection and support is related to childhood fears.

It is also known that the more a girl loves her father, the more like him she will look for a man as her life partner. Conversely, the father's absence and a lousy relationship usually lead to difficulties in a woman's personal life. Again, this shows the paramount importance of a daughter's love for her father or lack thereof.

10. Duality as a cost of manhood and the humanism of evolution

What was and is happening to boys? Love for the mother cannot lead to identification with her and imitation. Such behavior has long been subject to strict social control through ridicule ("Don't be a sissy! You behave like a girl!"). Boys usually aspire to imitate their fathers and prestigious adult men, which is quite natural. Sometimes, as adults, they also choose girlfriends who look like their mother, though this tendency is not pronounced in girls.

Why is it that instead of syncretism, men develop duality — the ability to divide between "high" love for some women, admiration for them, and "low," purely sexual drive, even "lust" for others?

At first glance, there is an apparent symmetry: girls are forced to give up their beloved fathers as a partner, but boys are also forced to give up their beloved mothers. However, there is also an essential asymmetry here. Girls, growing up, retain an integral emotional complex of love and commitment, turning it on their peers (usually older than themselves, which, incidentally, is quite natural), while boys do not retain this integrity. Why not?

The principal solution is that in girls and women, the fear of loneliness with the need for protection and support remains the same during adulthood, while in boys and men, the primary commitment structure was destroyed and suppressed at some period of anthropogenesis. Since then, this drama has repeated with varying (un) success in the ontogenesis of every man.

It is typical for young boys to want to "marry" their mother. The subsequent understanding of the impossibility of fulfilling this desire connects with a forced denial of one's weakness, of the recognition that one suffers from loneliness and without a mother. Girls are allowed to be weak and defenseless, but boys are not. Here, as

usual, sexual selection and social, the cultural press were at work. Boys, adolescents who were unable to readjust, overcome fear or at least hide it, felt contemptuous. They were very likely not to pass the initiation test, were not considered "real men," and suffered a complete failure in the reproductive aspect. Other boys more widely could suppress fear. Later, they presented themselves as strong and courageous warriors, hunters, defenders. Naturally, such men were more successful in spreading their genes. In parallel, the masculine patterns of male behavior were spread and transmitted through cultural channels.

This "self-destruction with realignment" was also directly related to men's attitudes toward the mother. Her image usually moves into the mental realm of high feelings (it is not without reason that insulting the mother, especially in the sexual modality, in most cultures is the most humiliating for men and requires repulsion, even revenge). The same mental realm also serves as the abode of beautiful, inaccessible, forbidden women. They should be nobly protected and served.

Violent sexual needs in adolescence arise and grow apart from the realm of inaccessible beautiful ladies and high feelings. Instead, these "low" needs are more related to the motives of male self-assertion through aggressive "conquest," with claims to power and domination, with possible options of coercion, violence, or the simple purchase of sex.

Mature men (alas, not all of them) can combine high feelings of love, adoration, and sexual attraction to their wives and girlfriends. However, it is precisely the connection that is initially separate (!), so it is not uncommon for either part or the other to fall away. Respect, adherence may last longer, or vice versa, the sexual attraction of the spouse, remains, while love for her, respect, solidarity disappear. For women, the cooling-off occurs differently: someone she no longer respects or loves she no longer needs in bed.

For all the diversity of evolutionary biology concepts and the paleopsychology of sexuality, they have a common denominator— the premise of the selfishness of every sex, individual, and genome: the sociobiology "bible" title *"The Selfish Gene"* is not at all accidental. Even the subsequent wave of evolutionary explanations of human altruism still derives such behavior from the same selfishness.

In this respect, the notorious "uselessness" of the female orgasm, the difficulty, and insufficiency of explaining it through egoistic motives must be reinterpreted. Metaphorically, the female orgasm is a brave and even a pretty humane attempt of evolution to somehow compensate, to overcome the forced and depressing dualism — the cleavage in men's sexual life. Rejoicing and being proud that he delivered such a strong and impressive pleasure to a woman, her partner receives at least a part of that fullness and depth of love feelings, to which women are capable.

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Section 3

Sex and Gender Development

Chapter 3

Narrativity in Becoming Sex/Gender

Rogena Sterling

Abstract

Most discussions of sex and gender development are discussed as science and expressed as a linear progression from birth as one step as biology develops of which the psychosocial self is built upon. Though biology is an important to a person's being, including any modifications to it for a variety of reasons, it is not controlling of a person's identity. At the same time, the concept that biology is a material that is malleable of which a person's gender is constructed. A person can find in their inner psychological being their true self as male or female that may or may not reflect their assignment at birth. Neither of these tell story of life. A person's sex/gender is a narrative becoming over time from pre-birth through their death. Becoming includes, when permitted, spiritual and cultural aspects in addition to biological, psychological, and social aspects. When understood within such a narrative, a person's becoming (development) that reflects their identity as a gender-sex.

Keywords: narrativity, becoming, sex, gender, sex determinism, social constructionism, development

1. Introduction

Traditional societies have long considered what it means to be male or female, masculine and feminine. Ancestors have watched the sun and the moon for clues and signs as to natures of man and woman, masculine and feminine [1]. The creation stories around the world have always included roles of masculine and feminine in forming the world as we know it and its organizing principles [2–4]. Moreover, many places around the world did not organize their society within fixed, mutable concepts of positional understanding of masculine or feminine, but in the sense of balance, and acknowledged other possibilities of existence in between being male or female [5–9]. Both in human and animals, there has been recognition in diversity and transformative powers in the early times of society [1, 10, 11]. These societies had their own narratives on sex development and these remained throughout time.

Western narratives in sex and development have origins that can be traced back to medical and nonmedical philosophers over the last 2000 years. In Particular, the ideas from Aristotle, Plato, and Galen were influential medical thought on sex and development [12]. The ideas of how sex developed by these medical minds are somewhat strange today but set the early beginnings of scientific and medical understanding of sex development from the seventeenth century [12, 13]. For example, Aristotle did

not see men and women as identical but nor did he see them as polar opposites [12]. Through the expansion of the Roman Empire, there was a strong influence of religious ideals of sex which had held until the seventeenth century. Of interesting note, and seldom discussed of Western thought, intersex people have been used to understand the true nature of sex and what it could or should mean and understanding normal and abnormal development [14].

From the seventeenth century with pioneering new medical and scientific technologies, it was possible to understand sex diversity in its elements such as genetics and chromosomes, hormones, enzymes, anatomy such as genitals and gonads, and the many others. These have been important to understanding how sex develops. This chapter does not intend to reproduce detail of each of these in defining what they are, their variations, and involvement in development. There are many textbooks and articles explaining each of these.

The chapter focuses on the narrative of the understanding of sex and development. Science as with every area of life is explained and understood through narratives. Facts never speak for themselves, rather they are understood within schemas and worldviews through those narratives. Sex and development is a good example of one such point. Science has demonstrated much diversity is the elements considered to make up sex – chromosomal, genetic, gonadal, internal genital, external genital, pubertal, and psychological [13]. These have been understood for some time now. Sex development through the elements of sex is understood through narratives, and these narratives affect people's lives, physically, psychologically, and socially. Biologist Joan Roughgarden asks how do two fertilized eggs that start out looking about the same end up producing two adults as different as a man or woman, drag queen, or CEO [11]. How we understand the question and how it is narrated is of interest in this chapter. What is called normal and how it affects people who are outside normal is also important.

From narratives taught at school through to academic articles and books, the idea that biology controls development of the body. It is seen as a natural, biological process that begins from the joining of the two gametes – the egg and the sperm. From this point, a linear development progression begins that leads to a human being. It is that developing body that interacts with society. The chapter identifies how the current narratives either reinforce a biological essentialism or diminish the importance of biology in the narrative through social constructionism. There are issues with narrating through a biological essentialism of sex while also using a social construction of gender. Development cannot be reduced to either.

Rather the chapter focuses on the need to consider an alternative version of develop that is not focused on development like a mechanism nor as a social construction of development. The alternative is one of sex/gender narrative of becoming. It is a means of embodiment as through embodied being becomes from pre-birth through death. It is a narrativity of becoming that recognizes both a biological and social, and cultural being interacting with the surrounding environment.

The purpose of the chapter is not to debate the physiology, but how the narratives of these in development occur. It will do so through the differentiating between sex development or sex becoming. As the chapter will illustrate, the difference in the narrative is the difference of how people react to the body and the outside world throughout their life and also how medicine and society reacts to people of sex/gender diversity.

2. Failure of biological determinism and social constructionism in understanding sex/gender

Before continuing on the focus of sex and gender development, it is important to have a brief discussion of particular framings that have been utilized in interpreting sex development. These framings have often limited discussion and the historicity of such framings have often either been ignored or been forgotten in relation to discussion of sex development.

The two framings of focus here that influence the discussion of sex development are biological determinism and social constructionism. The influences of both of these have had political impact on the biological and social lives of people over the last many hundreds of years. In particular, these framings have had negative impact on diversity of sex and gender. It is important to break these down to understand the nuggets of truth in them, if there are any, and separate from issues to have oppressed groups of people.

2.1 Biological determinism

Biological determinism is the basic idea is that there is an underlying true essence that discontinues between forms of the essence and has a constancy in the absence of change over time (p. 13) [15]. Biological determinism represents the claim that the present states of human societies are the specific result of biological forces and the biological "nature" of the human species [16]. Biological determinism refers to the idea that human behavior originates in and is dictated by biological entities or processes, either innate or constitutional (p. 16) [17]. The essence indicates that certain phenomena are natural, inevitable, universal, and biologically determined, and any variation is attributed to the imperfect manifestation of the essences (p. 10) [15].

Biological determinism of sex thus is the criteria that determine as two discrete true forms – male and female – with no overlap or ambiguity. The biological traits (genetic, hormonal, neuro-atomical, and so on) determine a person's sex as male or female development through life (and holds their place in social life) with a heterosexual orientation (p. 10) [15]. Furthermore, it suggests that not only the biological traits, but also psychological and orientation reside within the individual as essence of their being (p. 13) [15].

Cultural determinism is another form believing that there are determinist attributes of being male or female that continues the Western ideals, for example, through gender. Gender is the viewpoint that women and men do differ because of socialization and that women are at least equal to and possibly superior to men [18]. It is another way to foil for biological determinism except for the biological but including virtually everything in the human social world such as capitalism, colonialism, urbanism, poverty, sexism, racism, social structure, imperialism, family structure, and an assortment of other social, economic, and political variables [19].

2.2 Social constructionism

Social constructionism is the any social influence on individual experience [15]. Burger and Luckman propose that reality is socially constructed, and that the sociology of knowledge must analyze the process in which this occurs [20]. Social

constructionism is not the trait of the individual such as taken from an essentialist position. Social constructionism sees it as a process external to the individual [15]. It suggests that the power and structures have control over the individual, and their traits are non-consequential. Moreover, while essentialists suggest universal values, social constructionists acknowledge there may be some universal traits, but there is no universal standard for such traits (p. 15) [15].

Social constructionism is often reflected through the notion of gender and development. The idea is that gender is not reliant on biological development, but the social structures in which the individual develops. It is not the gendered traits of the individual but the result social processes that are external to the individual that impact upon any traits of the individual [15]. Gender is defined by interactions between people, by language, and by the discourse of a culture [15]. Rather than conceiving of sexuality as an unchanging individual essence that we might trace over time, we can investigate its contingency upon historically specific frameworks of thought and practice (p. 91) [21].

2.3 Critique of both

Sex and gender development is still framed as both oppositional and disembodied. Like many concepts referred to in the nineteenth and twentieth centuries, they are seen as either/or concepts. While one framing focuses on biology or physiology drives development and behavior, the other framing disregards it in favor of the social and institutional derivation.

Basing sex/gender development in either biological determinism or social constructionism is both misleading and has negative impact on people, but especially those who do not fit within the ideals of male or female. Intersex and transgender people who have had various names over the years have been the most severely impacted through these framings and still continue till today. Both deny or ignore critical elements of how human beings become who they are.

Though Western feminists in particular long criticized the notion that the behavior and abilities of women are uniquely determined by their biology [22], they adopted the social constructionist framing established by medical professionals from psychological theory – plasticity thesis. While trying to overcome being bounded by biology, they shift the focus from biology to psychology, while maintaining the oppositional binary of being male or female.

What these narratives of biological determinism and social constructionism indicate are binary understandings and how the Western concepts of opposition hold in discourse. Science in all of its forms from biological through social science has been influenced by such discourses. Science is a process of narrating around the discover of facts and evidence. In itself, it is a set of information that is available to be women into narratives. These narratives are also influenced by ideologies and their worldview. It is time for a different discourse that recognizes truths while not essentializing individuals into a particular structure and form. It is also necessary to understand that people are not just machines open to receiving and performing or adopting social structures.

Though a person's biology does not define a person's life, it is still very important in the development of a person. The consideration of biology as a mechanical system or a controlling essence do a disservice to the embodiment of people and

their life experience. The implicit denial of the biological events of our lives has also failed to appeal to people's ideas of "common sense" [22]. At the same time, nonrecognition of the effects and/or interconnections of society and the environment also neglect major impacts on a person and development. Both determinism and constructionism in its forms deny connectedness and agency of the person and community.

3. Narrating the development or becoming of sex/gender

Understanding the framing of sex/gender, it is now possible to begin to consider the narrating of the sex and gender development or becoming. Narrating is core to the human experience. Human beings are self-reflexive, narrative beings transformed its raw experiences into abstractions [23]. Becoming indicates a person with capabilities and agency, a life plan, make choices and responsible to others [24]. It is organic yet susceptible to significant environmental, social, and cultural influences, for example, it assumes that it includes meaning and is value laden [24].

Self-narration is an experience of temporal dimension that gathers events together into a coherent and meaningful structure that gives significance to the overall configuration, that is, the person [25]. Narration cannot be only understood in objective social categories, and these cannot adequately account for the lived dynamic aspects, rather resulting in reductive and reified understandings [25].

To ensure an illustrative difference, the chapter will discuss a difference between the development of sex and gender and (sex) becoming. The distinction is important as it illustrates how these narratives are written into people's lives and what impact these narratives have.

Development since the early 1600s has been used to infer improvement, but for many individuals and collectives has resulted in quite the opposite. In terms of sex and gender, development implies a procedural sense or something being developed. It also indicates that such processes will follow linear paths from the beginning to the end. There is a determinist connotation within development and questions as to whether there is agency or autonomy possible in development. Development also suggests that that any deviations from the linear development processes are abnormalities. A clear example of such deviations is a population referred to as having disorders of sex development [26]. While there is a diversity of possibilities of the various biological parts of becoming, those not part of the ideal type are considered out of the normal, abnormal, or atypical.

In contrast, becoming is used to suggest organic nature of "becoming a person." Becoming involves more than an individuated process. It has a multitude of influences and interconnections from the social, spiritual/cultural, and environmental embodiment of the person. Further, individual becoming always involves and is part of community sustenance and identity. Becoming is ongoing with the possibility of transformation from pre-birth through death. It is not linear nor immutable. Becoming is a narrativity of the socialized sex through the embodied physiological being with the surrounding community and context depending world.

This part of the chapter will discuss sex and gender development and the differences and similarities. It will also set out how biological determinism and social constructionism are or are not embedded in sex/gender development. It will then move to sex becoming and how that differs from sex/gender development.

3.1 Sex and gender development

To begin with, it is important to briefly describe the common narrative of sex and sex development. The common narrative also indicates particular understandings of what is abnormal, even disease, and outside of the common narrative. These variations outside of the norm have had impact on people outside of the standard ideal of the heterosexual male or female.

The narrative of sex/gender and its development must begin with the structures upon which it is based. That is, there is a norm, a standard pattern all life follows and that norm states that sex is an oppositional binary of being male or female with the male includes particular biological characteristics while the female has other characteristics. There are other general characteristics that are shared between the two – males and females.

3.1.1 Sex development

The narrativity of sex development has an assumed foundation of an egg representing female and a sperm representing male. These are discrete and oppositional and the only possibilities. Females have XX chromosomes and particular physiology while males have XY chromosomes and particular physiology distinct from females. There are three core assumptions: it is binary (two different forms, male and female) which have distinct anatomical structures and biological functions; each form has different physical characteristics; and each form has different psychological and behavioral characteristics [27, 28]. There are two different species as male and female and not just two different reproductive systems (women have ovaries, a womb, and lactate while men are sperm producers) [29–31]. There are many texts defining these differences. Outside of these are mistakes of nature or abnormalities.

Sex development begins as process-based and linear. The very beginning of development is where the egg and the sperm meet and the egg provides an X and the sperm either an X or Y chromosome. Depending on what gene is provided from the sperm, X or Y, will determine if the newly formed zygote is a male or female. The zygote then begins the development process into either male physiology or female physiology. The presence of a Y chromosome makes the embryo develop as a male (individuals with Y will develop testes); in its absence, the default development is along the female pathway (ovaries will develop) [30]. Sex development theory assumes a master template (a master gene) as the norm that triggers a subordinate gene which cascades to downstream genes in a descending hierarchy of control [11]. As an analogy, development occurs as though a bowling ball was accurately rolled to hit a genetic kingpin at just the right spot and cause all the genetic bowling pins behind to fall down in perfect order and producing a normal baby is bowling a genetic strike [11]. This assumes there is a close linear association of "3G" sex – genetic, gonadal, and genitals – as core markers of sex [30]. The sex will then lead to the direction of other related sex characteristics. The chromosomes lead to a linear development of other anatomical structures including those often referred to as sex structures (e.g. ovaries, testes, uterus, scrotum, vagina, and clitoris) and most importantly the brain and the neural system [32].

From the time of birth, the linear development continues along the chromosomal pathway albeit at a slower pace until puberty. At puberty, sex development continues with "secondary sex characteristics" of body hair, breasts, voice, pitch, menstruation, and sexual sensations and desires [13, 32, 33]. One's biological sex further develops

into adulthood. Later in life, other factors change such as menopause in women. Up till recently, it has also been assumed that this determined sex will also determine one's sexual relations, and hence the system of heterosexuality.

Development assumes an oppositional binary whereby from chromosomes to hormones to gonads to secondary sex characteristics there are only two choices: male (XY) or female (XX). The assumption is social sex social roles and function, expression follows on from sex development as male or female as biology established [34]. In another words, sex is understood here as a status determined by nature that unfurls into sociopolitical roles. Sex is so fundamental in the developmental program and experience is secondary to that of development in forming the male brain and male nature, or to a female brain and female nature [30].

The general sex development theory at its core is biological determinism. It infers that social development derives from the biological essence. The narrative imposed on these development systems upholds the oppression based on biological systems. It also maintains that any variation and difference is abnormal or not socially acceptable.

3.1.2 Gender development

Prior to the 1950s, the term gender was not used, and social roles, expressions, and others relations to sex came within the umbrella of the term "sex." The assumption was that the development of biology would extend to the developing of matching social roles and expressions and so on of society. When held strictly to such ideas, it became biological essentialism in that the person's biology dictated the person's position and function in society. Enforcement of biological determinism has led to sex oppression over the years, which has been often centered through patriarchy. Biological determinism of race and sex which began in the seventeenth century was recognized as having large social repercussions, especially for women and people of sex diversity [35]. Feminists have long criticized biological determinism that subordinated women to the behavior and abilities of women uniquely determined by their biology [22].

Gender as a concept and understanding arose with the rise of plasticity of human being [36]. The psychological theory posited that human beings are malleable or there is a plasticity of human beings [36]. This was the idea that humans are malleable beings and not fixed and subordinated to biological traits such as race and sex. It has its roots in the work of Konrad Lorenz concept of imprinting into dominance and adopted by Dr. John Money in establishing gender to imprint intersex people into the male–female binary [37]. The biological morphology (outer (and sometimes inner)) body was malleable and alterable [38]. The intersex and transgender persons' bodies were alterable to fit the assigned or re-assigned gender. Dr. Robert Stoller extended the concept of gender to suggest that once a gender was assigned at birth, biology virtually superfluous except to medical professionals and produced the raw material (linear development) upon which gender developed which became known as the sex/gender split [37–42].

Gender indicated that irrespective of the diversity of biology, a person's development began from the assignment of gender at birth along with any necessary alteration of biology to match that assignment. A person's gender identity derives from an inner sense of self – the psychological self – that usually matches the assignment at birth [37, 39, 43]. That sense of self develops social cues around them into the masculine and feminine person they were assigned to be. Gender development enables

a concentration on the development psychological phenomena such as thoughts, behavior, and personality [37, 39]. A person has the ability to take roles that are not based on their biology in society and therefore be equal to each other – that is equality of man and woman (at least in theory). Gender development is the way a person perceives, expresses, and experiences sex identity within social relations of a social-political environment through imposed expectations (such as getting married and having children), norms, qualities, and behaviors upon an individual which vary across history societies, cultures, and classes [11, 44–49]. Gender development is a complex process within the sociopolitical world. It is an integration of one's "inner sense of being male or female" experienced within the sociopolitical expectations and is influenced by other's view of themselves [50].

Gender development begins at the time of birth, though some cues are even learnt pre-birth. Late in the pre-birth process, the fetus recognizes cues of acceptability within society of what it means to be their gender [51, 52]. After birth and by the age of 5 years, a child recognizes their gender; however, the child also recognizes the what gender recognition is acceptable or needs to be concealed/suppressed within the social setting and expects them to be [53, 54]. Through the early years, the infant continues to pick up those cues around them. As the child develops, they encounter endless gender clues and hints in the real world including gender stereotypes, encouraging or discouraging words, expressions, or body language from others, and sex segregation of adult social roles [30]. These clues and hints are taken on board in the person's gender development. Consciously or unconsciously, developing gender with its associated patterns of permitted freedoms is quickly understood including the boundaries of that gender [31].

From childhood onward, gender development is fortified through internal and external sense of their psychological self [13, 33]. Development includes socially appropriate cues of being male or female including the socially constructed roles, behavior, activities, and attributes [55]. Development is reinforced through carers, whether it is family or other members of society their own social interests in the child's gender becoming are reinforced [56]. These considerations influence one's inner sense of self as expectations about the characteristics men and women have, and as gender norms dictating double standards for how women and men should behave, influencing people's interests, self-concept, performance, and beliefs about capabilities in gendered domains [30].

Moreover, as one matures, one continues to author gender as cued by relationships, society, and sociality [56]. This continues with the child as their status as sex determined, and gender authored. This becomes their sociopolitical status of life which is not escapable. It is central to and entangled within one's social and legal life of recognition and relationality. At an early age, they pick up on cues about acceptable and non-acceptable relationships, even though they yet may not know their favored sexual relationships [53, 54]. As they turn to their teens, they begin to form relationships usually favoring culturally accepted values, such as heterosexual [53, 54]. The infant uses these ques. as a guide together with the gendered world around them in becoming their gender. These relationships primarily adhere to the sociopolitical way of life.

Gender introduced by Western feminists into the public sphere derived from and was based in the work of Dr. John Money and Dr. Robert Stoller. They accepted that through gender it was possible to socialize a person into an assigned sex stable sexed subject [37]. The focus of the theory was to normalize intersex and transgender people into the male female binary as they were creating ambiguity of the two-sex

system. The sex/gender split introduced by Dr. Stoller was essential to feminist work. Removing biology as the root of the diversity enabling a capturing of these populations and normalizing them with the binary, oppositional system. Moreover, gender did not interfere with the broader institutional, patriarchal system, but only remove biology as an essence upon which it was built. This enabled women to be equal in social and psychological development as men. It was this idea that feminists adopted introducing gender into the public sphere [37, 39].

3.1.3 Variation and sex/gender development

Western science has had an interesting relationship with biological diversity. As far back as the Greeks such as Aristotle and Plato, there was recognition of the diversity of being beyond male or female even though there was little acceptance of them as full human beings [12, 14]. Since the modern science period, there has been a large discovery of various diversities of sex and gender.

Sex development and diversity are not generally considered as possibility. When sex development ranged beyond the standard norm, they as considered as abnormal sex development. Though sex diversity was not fully accepted, especially in the West, under various names people we call intersex and transgender people today still existed.

Due to greater awareness of biological diversity and social unrest of norms including increasing awareness and recognition of gays and lesbians, and fear of communism, there was a need to protect the binary and diminish and erase diversity [37]. Gender was such an institution to remove sex and maintain the binary including its meaning and basis in society. Dr. John Money established gender it was to erase the possibility of intersex people and ensure they conform to being male or female to fit into society. He believed that in spite of the physiological characteristics, intersex children were malleable and could be assigned a gender – male or female – and raised accordingly [57]. Once assigned, there may be necessity to change the child's body to match the assignment – completing what nature did not finish – and encourage child and parent bonding and development of gender [38].

Dr. Robert Stoller also worked with Money's notion of gender in his work with transgender people. Transgender was earlier understood as a biological reality, but this was transformed by Stoller as an independent psychological phenomenon (p. 31) [37]. The development of gender identity as a psychological reality shifted sense of embodiment that transgender people once had (p. 99) [38]. Though transgender people may have desired transformative support of particular biological parts, they still would relate to the world through their body. The focus of gender changed that indicating that the relationship was through their psychological being.

Both for intersex and transgender people, they were seen as diseased and in need of a cure [11]. By fixing these groups, they could live successful lives in society. Such an implementation of social construction upon the bodies and lives of these groups was still rooted in biological determinism – the belief that there are only two human which are male or female.

Though gender was an attempt to overcome the problems of biological determinism, through using social constructionism, it is questionable to what extent it has done so. Gender and its development are underpinned by cultural determinism based in the male and female ideal (minus the control of biology). It has not freed society of the shackles of the binary understanding of the world as an immutable state and

erased diversity. Though there is a use of the term gender diversity, it is in the sense of social constructionism and not including biological diversity such as intersex people exemplify nor does it provide for and enable embodiment.

3.2 Narrativity in becoming a sex/gender

The development of sex and gender indicated a linear process of development as either male or female. Any deviation was a developmental error. This has led to nonrecognition of people who are no longer recognized as a person without the help of medicine to rehabilitate them into the standardized norm as a male or female, even if it was the opposite to that assigned at birth (as with transgender people).

Narrativity of becoming is not just a different name but indicates a different way to understand a narrative of how a person becomes who they are. As mentioned earlier, it is organic interaction and interconnections of their embodied being within a social-cultural and environmental place. Embodiment moves beyond the body as a bodily form to a conception that through the body provides realms of agency, practice, custom, and so on [58]. It infers social relationality and connectedness – a sense of belonging. Embodiment indicates the agency and experience of the world through a person's bodily form, mediated from physiology within and the cultural, social, political, and environmental world without [58]. Becoming throughout their life is inclusive of overlapping and intersecting multiplicities such as sex/gender, race, ethicality, class, (dis)ability, and so on. Becoming is a process of evolving, reinventing, or transforming nature [59]. It is a mediation between stasis and change [25, 60] where nothing is resolved or in closure, yet often contradictory as it accommodates the emergence of new possibilities or transformations of the whole and the parts of one's becoming [50, 59–63].

The very beginning of sex becoming is prenatal. As various physiological interactions begin, there are decisions made as to "pathways" of becoming of the future being. Each physiological part of a person is a the consequence of dozens of different genes and numerous pathways by which cells are assembled, differentiated, and assigned alternate functions in sex becoming [13]. Even chromosomes do not operate in isolation but require certain biochemicals called enzymes to makes the genes effective [11]. As Joan Roughgarden suggests as analogy, it is like a committee (chromosomes, hormones, enzymes, and other physiological members) that meets throughout becoming even at the early physiology stages before society and culture even have become part of the person's becoming [11]. This analogy is important to indicate that diversity in biology and physiology is important in becoming but is not an automatic process but organic with multiple possibilities.

The processes continue from the time of birth. The only difference is that from the time of birth the social, cultural, and environmental members of the committee have more voice on the committee that they had pre-birth to continue the analogy further. Becoming continues through childhood, adolescence into adulthood. Even late into the later stages of life becoming, or even slowing of life, continues. Becoming is a recognition of the interconnectedness not only of the people around them but also the land from which they derive.

Sex becoming is the embodiment of being and belonging as male, female, both, or neither relating how they see themselves, and how they think others see them, in performing social roles, expressions, and functions through their biological body [51, 64–66]. Such a becoming enables people to connect with their spiritual and

cultural ancestral beings and contribute to overall human potentiality and community sustenance and identity. Although sex becoming will always in and through social relations, the relations will not necessarily completely define us where reciprocity exists and there is respect for uniqueness of being.

Becoming is organic enables transformative possibilities. Though it recognizes biological and physiological importance, it is not as a controlling force as in biological determinism. Rather, it is in the sense of embodiment, that is through the body (whether it is in the form that one is born with or has been transformed due to medical necessity or gender-confirming need) with the social and environmental interconnectedness. What becomes clear is social constructionism does not provide the basis for embodiment and interconnectedness but leads back to a type of determinism.

4. Conclusion

The aim of this chapter was not to go through the various biological mechanisms involved in sex development. As mentioned near the beginning, there are numerous texts out there providing eloquent discussions of the various parts and their functions in the development process.

Rather, the chapter has aimed to focus on the narratives used in describing the development process. All facts are only understood when incorporated within a narrative. As noted in the chapter, all meaning is understood through narratives. Whether in early times, in the modern era, or the technological era, narratives are how humans understand the world. It is through these narratives that it is possible to indicate what something is worth and how it is valued. The narratives are also central to social organization and understanding how a person fits into the world around them and what functions they may have within society.

Sex and gender development narratives are bound within narratives that have been maintained over many years through religious and scientific dominions. The early understanding was through early form and the more direct biological determinism. Though it has largely been debunked regarding race, there is still a strong support for such ideas today regarding sex and sex development. Many of the texts do not use the words today but when read contextually still maintain such a theory.

The introduction of social constructionism, however, was aimed to curve the impact of sex determinism, or at least that is how some in the gender studies have argued. The idea of social constructionism is that biology should not and does not control destiny. Though there was oppression linked to biology as destiny, and hence the purpose for introducing social constructionism, at the same time it has led to the abandonment of embodiment. Furthermore, in particular for sex/gender development has been implemented as the same ideology as a binary, oppositional system of male and female only not based on biology determining future roles and functions of people. The result has been a cultural determinism and enforcement of a Western ideal of what is means to be male or female and the spreading of its particular narrative of sex/gender development.

The group or population that has suffered the most of both of these ideas has been those of sex/gender diversity. While under sex biological determinism has led to limited or no recognition and acceptance, under social constructionism it led to enforced transformation into assigned or reassigned genders which often also involved changing the morphology of the body to match their newly assigned

genders. A greater impact for both intersex and transgender people was the loss of embodiment as the move to gender concentrated a person's knowledge and sense of oneself was based in their psychology. Not only did it deny a relationship with the person's body and being, but also it was an individualizing process separating people from community and connectedness. The effect of social constructionism, or even it could be argued cultural determinism, was a loss of ability to develop a diversity of being, for example as intersex or transgender, that was outside of the framing of maleness or femaleness.

Realizing development as a becoming enables a return to embodiment. It is a relation to the body (even if it be transformed from that at birth) and at the same time, a relatedness to the social and environmental world around them. Mover, becoming was organic, not linear nor immutable. It provided a means of agency yet still had bounds of social and cultural responsibility.

Understanding development as becoming recognized the complex organic being with multiple interconnected communicating with each other. From both internal and external directions, the physiological, social, psychological, and cultural multiplicities communicate and discuss at various stages of becoming of what possibilities there are and which direction to become. It is an ongoing process that continues through death where even some cultures would suggest that some of these multiplicities continue becoming in some way.

Becoming does not deny that there are external forces, yet at the same time recognizes that agency derives through the embodied being, and not simply a psychological sense of self. It is a means of acknowledging a cultural and spiritual connectedness of being along with its collective identity rather than the individualized and atomized notion of being. Becoming is a narrativity of the socialized sex through the embodied physiological being with the surrounding community and context depending world.

Understanding development through a different paradigm does not deny biological or physiological reality but does change the narrative of how life, society, and the surrounding environment connect and organize together. It provides a narrative of cohesiveness yet respect for difference and uniqueness, while individuals have duties to one another. As such, it provides a space of relationality rather the separateness and individuality that derives from sex/gender development.

Conflict of interest

The author declares no conflict of interest.

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Chapter 4

The Biological Basis of Gender Incongruence

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Abstract

Gender incongruence (GI) is defined as an individual's discontent with their assigned gender at birth and their identification with a gender other than that associated with their sex based on physical sex characteristics. The origin of GI appears to be multifactorial. From the extensive research that has been conducted over the past few years, four main factors have been identified as key mechanisms: genes, hormones, epigenetics, and the environment. One of the current hypotheses suggests that GI could be related to a different sexual differentiation of the brain as a result of changes in the DNA sequence of the estrogen receptors ERs and androgen receptor AR genes. These changes in the DNA sequence would imply a variability in the sensitivity of the hormone receptors, causing a genetic vulnerability.

Keywords: transgender, cisgender, healthcare, gender incongruence, gender dysphoria

1. Introduction

Chromosomal sex (established at the time of fertilization), gonadal sex (a direct result of the genetic complement), and brain sex (the result of genetic and hormonal actions) tend to be coincident, giving rise to the deep conviction of being male or female. But discrepancies between gender and the sex assigned at birth are also possible. Thus, gender identity could be defined as one's personal conception of oneself as male, female, a blend of both, or neither [1, 2] that could be coincident or not, with the sex assigned at birth. According to this con- or discordance, we can differentiate into "cisgender" or "transgender" people, respectively [2]. Gender incongruence (GI) in the ICD-11 [3] is characterized by a pronounced and persistent discrepancy between the individual's experience of gender and their sex assigned at birth.

The brain, like the gonads, is a sexually dimorphic organ, in such a way that genes located on the sex chromosomes will determine the sex of the brain [4], either indirectly by acting on the gonads, which, in turn, will produce different gonadal secretions according to the sex, or through the direct action of the sex chromosome complement XX or XY in brain cells [5].

Once the differentiation of the sexual organs is complete, and gonadal sex is established (ovaries versus testicles), the sexual differentiation of the brain will take place toward the second half of pregnancy. Then, the testicles begin to secrete

testosterone, while the ovaries remain quiescent. Testosterone, which is also essential to complete the differentiation of the male sexual organs, will penetrate the brain and act through the androgen receptors (AR), or after its aromatization [6–9] activating the estrogen receptors ERα and ERβ, respectively involved in masculinization and defeminization of the nervous system [10]. Exposure to testosterone, through activation of the AR during this critical period, is a prerequisite for masculinization of the brain, ensuring that gonadal sex coincides with cerebral sex. The organization of the brain by the action of hormones during this embryonic period, and the subsequent activating effects on sexual behavior in adult life, form the basis of the brain-behavior organizational and activation hypothesis [11].

Since the sexual differentiation of genitalia and the sexual differentiation of the brain occur at different times in intrauterine development, they may take different directions, and in that case, the degree of masculinization of the genitalia may not reflect the degree of masculinization of the brain, giving rise to individuals with XY karyotype and male genitalia, but with feminized brains, or individuals with XX karyotype and female genitalia, but with masculinized brains [12].

2. Mechanisms implicated in brain dimorphism

Transient perinatal exposure to testosterone or its metabolite, estradiol, causes many of the best-studied sex differences in rodent brains, and recent evidence suggests that epigenetic mechanisms underlie many of these hormonal effects [13–17]. For example, sex differences in the preoptic area of the hypothalamus are altered by injecting a methyltransferase inhibitor directly into the brain of newborn rats or mice during the critical period for sexual differentiation [18, 19]. Similarly, a neonatal disruption of histone acetylation inhibits the development of sex differences in copulatory behavior in male rats [20] and modifies the size of the bed nucleus of the stria terminalis (BNST) in mice, a region of the brain linked to male sexual behavior [21]. These findings suggest that sexual differentiation of the brain requires orchestrated changes in DNA methylation and histone acetylation [13].

In another approach, based on genome-wide studies, both histone methylation and DNA methylation patterns differ by sex in the mouse preoptic area [22, 23]. Testosterone treatment of newborn female mice partially masculinizes the DNA methylation pattern present in adulthood [23], and sex differences in methylation of specific genes are also reversed by neonatal steroid treatment in rats [24]. Therefore, steroid hormones alter the expression or activity of enzymes that place epigenetic marks [19, 25, 26], which may be the mechanism by which hormones affect the epigenome [13].

Another study in rodents infers the role of chromosomal and hormonal sex in brain epigenetics. In rats, mothers lick their newborns more frequently if they are male than if they are female [27], and the amount of maternal attention that a rat pup receives affects the degree of methylation of the estrogen receptor alpha ESR1 gene in the brain [28, 29]. Edelmann and Auger [30] randomly assigned some female newborns to receive the extra attention normally given to males by simulating anogenital licking with a brush. This, in fact, masculinized the methylation pattern of their DNA and modified the expression of the ESR1 gene in the cerebral amygdala of the treated females [30]. In this case, the differential mother's care is based on the odor of the newborn's urine [31], which in turn is due to differences in circulating testosterone, and thus to genetic and hormonal sex.

On the other hand, some sex differences in the brain are independent of gonadal hormones and are instead due to the complement of sex chromosomes itself [32, 33]. In this way, sex chromosomes alone influence the expression of epigenetic enzymes and cause sex differences in the epigenome of rodents and flies [32, 34]. Thus, based on animal studies, the two main determinants of biological sex (sex chromosomes and gonadal steroids) contribute to sex differences in the brain epigenome [13].

But in humans, information on sex differences in the brain epigenome is very limited. During some stages of human fetal development, male and female brains differ in both DNA methylation and hydroxymethylation [35]. Because these differences are seen before birth, and presumably before social influences, they are differences due to sex and hormones. There are also differences in epigenetic marks in the prefrontal cortex of adult men and women [36–38]. However, adults have had many experiences of gender, so it is not clear whether these differences are due to sex or gender.

3. Sexual dimorphism of the brain and gender incongruence

The hypothesis of sexual differentiation of the brain has also been studied by verifying to what extent the brain of people with GI agrees with their natal sex or with their gender [39]. Although the role of brain dimorphism in the development of GI remains unclear, it appears that it is the result of a combination of the effects of hormones in the brain, the expression of certain genes, and epigenetic factors. Due to the complexity of this combination, it is especially difficult to determine the degree of the implication that these elements have separately.

Some in vivo studies suggest that, in general, the brain morphology and cognitive performance of the transgender population show a remarkable congruence with that of their natal sex. However, most literature indicates that the structure and functioning of the brain of the transgender population are more consistent with their gender than with their natal sex and that the trend toward cerebral feminization in transgender women, and toward masculinization in the case of transgender men is an innate quality, independent of hormonal treatment [40].

Hahn et al. [41], in a study on brain connectivity networks in transgender people, found a decreased intra-hemispheric connectivity ratio for transgender women in the subcortical and limbic regions compared to the cisgender population. In the group of transgender men, they found a decrease in intra-hemispheric connectivity between the right subcortical/limbic areas, and in the right frontal and temporal lobes compared to the cisgender population and transgender women. Differences between transgender groups and the direction of brain connectivity suggest that GI is characterized by specific but distinct brain signatures for both transgender groups [41].

Research in the field of gender-affirming hormone treatment (GAHT) has provided much insight into the origin and development of brain sex differences, through the manipulation of gonadal steroids [40]. Sex hormones influence the morphology and functional organization of the brain not only during prenatal and peripubertal development, but studies of gender-affirming therapies have shown that sex hormones can affect the brain even when it is fully developed and that they do so in a non-uniform way. So that some structures tend to be modified in favor of the chosen gender, while others do not, or are located in an intermediate position. It has been found that, in transgender women undergoing GAHT, the volume of the amygdala, corpus callosum, and nucleus putamen do not differ from that of cisgender men, corresponding to their natal sex, while the right insular cortex and right

temporal–parietal junction are larger than in the two cisgender groups. However, in transgender men, the third ventricle and the nucleus accumbens are different to in cisgender women, coinciding with the chosen gender and not with their natal sex. Cisgender men, like transgender women undergoing GAHT, have higher overall gray matter volume than cisgender women in the posterior superior frontal cortex, whereas both transgender women and transgender men have lower gray matter volume in the insula than cisgender women [40]. In another study, changes in testosterone levels in transgender men were found to be inversely correlated with gray matter volume in Broca's and Wernicke's areas after four weeks of GAHT [42]. Despite the differences in the results, in general, these studies indicate that transgender women present demasculinized patterns in terms of cortical thickness of the white matter microstructure, that transgender men present defeminized patterns, and that both, women and men transgender, have a characteristic and complex sexual differentiation in a mosaic form [39, 43].

4. Major studies on the genetic basis of gender incongruence

Regarding its etiology, GI is considered multifactorial and complex. Thus, there is not a single gene or a single factor that could explain GI. It might be associated with neurodevelopmental processes of the brain, as well as hormonal, genetic, and epigenetic factors, among other possible influences. The main studies on the genetic basis of GI have been focused on the genes involved in the sexual differentiation of the brain: the androgen receptor AR, the estrogen receptor α ESR1, the estrogen receptor β ESR2, the aromatase gene CYP19A1 and the CYP17A1 17-alpha-hydroxylase.

The scientific evidence accumulated in recent years points to a complex etiology with hormonal, genetic, epigenetic disruptors, and immunological mechanisms that cause a specific neuropsychological profile [17]. One of the current hypotheses suggests that GI could be related to a different sexual differentiation of the brain, not concordant with natal sex or sex assigned at birth, as a result of changes in the DNA sequence of the estrogen receptor α- β genes (ESR1 and ESR2) and the AR androgen receptor gene, as well as the CYP19A1 and the CYP17A1 genes [44]. These changes in the DNA sequence would imply a variability in the sensitivity of hormone receptors, causing a genetic vulnerability related to the production of hormone receptors that are more or less sensitive to their ligands (estrogens and androgens).

The ERα-β and AR receptors are proteins that bind their ligands (estrogens and androgens, respectively). These receptors are present in most of our cells (including neurons in the hippocampus and hypothalamus) and their presence allows cells to respond to steroid hormones. Generally, these receptors float in the cell cytoplasm in an inactive form, but when they bind to their ligand, they take on an active form (dimerization) that allows them to enter the cell nucleus and bind to specific DNA regions located near the promoter regions of numerous target genes, modulating the transcription of thousands of genes related to sexual development in a domino effect. Therefore, ER and AR are proteins that can act as hormone receptors and, at the same time, as transcriptional regulatory molecules [45]. All these ideas led to the suggestion of the possible involvement of these receptors in the genetic basis of GI.

The first study on the genetic basis of GI was conducted by Henningsson et al. [46], who analyzed for the first time three repeat polymorphisms located in the ERβ and AR receptor genes and the aromatase enzyme gene (CYP19A1) in a population of 29 transgender women. Specifically, they found longer polymorphisms (with a higher

number of repeats) in the trans population. In addition, the logistic regression analysis indicated the existence of interactions between the three analyzed polymorphisms that increase the possibility of gender incongruity. In this way, the results obtained by Henningsson et al. [46] suggest that the risk of presenting GI is also influenced by the other polymorphisms (of the aromatase gene and the ERβ), but the contribution of these other genes is much greater in the presence of short AR alleles. In addition, they found that male carriers of less active AR receptors (long alleles) were more likely to show GI.

Later, Hare et al. [47] replicated the study of Henningsson et al. in a larger population of transgender women, also finding longer AR polymorphisms in the transgender population. However, when Ujike et al. [48] analyzed the same polymorphisms (and others) in a Japanese transgender population, they found no statistically significant data. But we must point out that Ujike et al. [48] incorporated small modifications into the analysis (they used the mean instead of the median to obtain the short and long alleles), which makes it impossible to compare their results with the other investigations.

These and other polymorphisms were also analyzed in a Spanish population. Thus, 974 transgender individuals were analyzed versus a cisgender population of 1,327 individuals [49–51]. The results confirmed the involvement of both ER α-β receptors in the genetic basis of GI. In addition, crossed associations were also found between the analyzed polymorphisms that were overrepresented in the transgender population [44].

In 2008, Bentz et al. [52] increased the list of the analyzed genes in the GI population with a study of the CYP17A1 gene in a transgender population from Northern Europe (Austria) consisting of 102 transgender women and 49 transgender men, who were compared to 1,671 cisgender individuals (756 men and 915 women) [52]. The results supported the association between the CYP17-rs743572 polymorphism and GI since the mutated allele (A2) was overrepresented in the transgender population compared to the cisgender population. Furthermore, the authors found a sex-dependent allelic distribution in the cis population.

In 2016, our group expanded the study of the CYP17-rs743572 polymorphism in a Spanish population with GI (317 transgender women, 223 transgender men, 264 cisgender women, and 358 cisgender men) [53]. Contrary to Bentz et al., in the Spanish population, the allelic and genotypic frequencies did not show statistically significant differences between the cis and transgender populations. Furthermore, the allelic and genotypic frequencies did not differ significantly between both cisgender groups, contrary to what Bentz et al. [52] had previously suggested. Our results, therefore, contradicted the involvement of the CYP17-rs743572 polymorphism in the genetic basis of GI, based not only on the analyzed population but also on data derived from the 1000 Genomes database and those obtained in a bibliographic review carried out specifically for this study.

The existing discrepancies between our work and the study by Bentz et al. (2008) are due to problems in the selection of the female cisgender sample in the Austrian study since the cis group comprised of women who had made medical consultations for perimenopausal disorders. In this sense, the statistical significance obtained by the Bentz group could be related to diseases dependent on the functioning of estrogens, but not with GI. In conclusion, we can state that, according to our data, the CYP17-rs743572 polymorphism is not associated with GI. Our research group did not confirm the involvement of this CYP17-MspA1 (rs743572) polymorphism or CYP19A1 (rs60271534) in the genetic basis of GI when analyzing a Caucasian sample of Spanish origin. Our results were later confirmed by other groups [54, 55].

Subsequently, the interaction analysis between polymorphisms through a logistic regression study showed the existence of an inverse allelic interaction between ERα and AR in a transgender women population. An association between ERα and ERβ was also found in the group of transgender men. These data confirmed the key role of ERβ in brain gender development in humans [44].

On the other hand, Ramírez et al. [56, 57] analyzed the involvement in GI of the activating molecules of the ERs and AR confirming their involvement in the sexual differentiation of the brain and the fundamental role that estrogens play in it. The authors analyzed 247 polymorphisms distributed in the coactivators NCOA-1, NCOA-2, NCOA-3, NCOA-4, NCOA-5, p300, and CREBBP in a population of 94 Spanish transgender individuals versus 94 Spanish cisgender individuals, with the same geographic origin, race, and biological sex. When they compared the distribution of the allele and genotype frequencies, they found significant differences in 11 polymorphisms that correspond to 4.45% of the total analyzed: three polymorphisms located in NCOA-1, five in NCOA-2, two in p300, and one in CREBBP.

These data are in concordance with a recent work that showed that the nuclear receptor coactivators, NCOA-1, NCOA-2, and p300, are essential for efficient ER transcriptional activity in the brain [58]. Moreover, Auger et al. [59] investigated the consequence of reducing NCOA-1 protein during sexual differentiation of the brain and reported that reducing this protein interferes with the defeminizing actions of estrogens in neonatal rat brains. Auger's data indicated that NCOA-1 expression is critically involved in the hormone-dependent development of normal male reproductive behavior and brain morphology.

On the other hand, epigenetics offers a very interesting complement to genetic studies because it provides a relationship between genes and the environment. Epigenetic modifications determine which genes are expressed at each moment, in response to specific environmental stimuli. But so far, investigation of the implication of epigenetics in GI has been very limited. Two studies in adult transgender populations have shown that certain environmental factors, such as GAHT, modify the methylation profile of the promoter regions of the ESR1, ESR2, and AR genes [60, 61]. Furthermore, one analysis of global DNA methylation showed that there are differences in the methylome of the transgender population even before GAHT treatment [62]. The main finding of that work was that cis and trans populations have different global CpG methylation profiles, even before GAHT. When comparing trans woman versus cis men, 22 CpGs with significant methylation were located in islands. However, with respect to trans men, significant changes of methylation were found in only 2 CpGs. Furthermore, one of this CpGs, related to the MPPED2 gene, was shared by both transgender populations.

The most significant CpGs in trans women were related to genes WDR45B, SLC6A20, NHLH1, PLEKHA5, UBALD1, SLC37A1, ARL6IP1, GRASP, NCOA6, ABT1, and C17orf79. Among the most statistically significant CpGs, at least four of these genes were involved in brain development and neurogenesis (WDR45B, SLC6A20, NHLH1, and PLEKHA5), and three were related to transcriptional functions (NHLH1, NCOA6, and ABT1). Furthermore, the gene C17orf79 is related to chromatin organization and its activation stimulates the transcription of the AR. Finally, another two genes were related to glutamate synapses (ARL6IP1 and GRASP).

With respect to the MPPED2 gene, it is expressed in most human tissues, and the brain, in men and women, and is expressed predominantly in fetal brains. Furthermore, MPPED2 expression is modulated during development, attributing to this gene an important role in the processes of neuronal differentiation at the

embryonic stage [63]. Cg23944405 related to the MPPED2 gene is hypermethylated in both trans populations before GAHT. Thus, the investigation of Ramírez et al. [62] tells us that epigenetics also plays an important role in the etiology of GI.

5. Mitochondrial genes and sexual dimorphism

Mitochondria are intracellular organelles that are fundamentally involved in energy generation processes. Mitochondria have their own genetic material made up of DNA, with certain peculiarities. Among them, it stands out that DNA is double-stranded, circular and occurs in multiple copies (>1000) in the same cell. More than 93% of mitochondrial DNA is coding (compared to only 1.5% of nuclear DNA) and its 37 genes are intron-free [64]. Another of the most relevant aspects of mitochondria is that they are only inherited from the mother since they are found in the cytoplasm of the egg fertilized by the sperm (which only provides the nucleus for the newly formed organism). Therefore, the mitochondrial genetic material of any individual is inherited exclusively through the mother.

Mitochondria perform various interconnected functions, producing ATP and biosynthetic intermediates that contribute to cellular stress responses such as autophagy and apoptosis. They produce ATP through oxidative phosphorylation (OXPHOS) and play a key role in global energy modulation. An increased need for ATP is satisfied by increasing mitochondrial mass and inducing OXPHOS. The regulation of mitochondrial biogenesis is closely coordinated with pathways that induce vascularization and improve oxygen delivery to tissues [65].

Mitochondrial functioning is also sexually dimorphic. Association studies in humans have revealed sex-specific quantitative trait loci (QTLs) that regulate the mitochondrial content of blood tissue [66].

Other work has also suggested that sex hormones play a role in regulating mitochondrial dynamics, metabolism, and cross-talk with other organelles. Specifically, the female sex hormone estrogen has both a direct and indirect role in regulating mitochondrial biogenesis through PGC-1α, a mitochondrial gene coactivator. On the other hand, testosterone is cardioprotective in men and can regulate mitochondrial biogenesis through PGC-1α and PGC-1α.

Both the estrogen receptor ER and the androgen receptor AR are associated with mammalian mitochondria. Estrogens are best known for being antiapoptotic in muscle and neural tissues in the event of stress. Data demonstrate that mammalian sex steroids are potent regulators of stress response at tissue and individual cell levels [67].

To our knowledge, no studies have been published about the role of mitochondria in the genetic basis of GI. Nevertheless, given the association between ER, AR, and mammalian mitochondria, our team deemed it interesting to analyze 242 mitochondrial single nucleotide polymorphisms (SNPs) in a transgender versus a cisgender population, and the results of the whole study are presented here.

The study was conducted in a population of 94 transgender individuals and 94 cisgender individuals, with similar characteristics of race, biological sex, and geographic origin. The inclusion criteria were: presenting gender incongruence according to ICD-11 and having no disorder of sexual development. The exclusion criteria for all participants were DSD (differences in sex development), neurological and hormonal disorder, major medical condition, and history of alcohol and/or drug abuse.

The cisgender population was selected from a country census (Pizarra, Málaga, Spain) matched by geographic origin, race, and sex. Written informed consent was obtained from the transgender group after a full explanation of the procedures. The study was approved by the UNED Ethics Committee.

The analyses were conducted by chromosomic sex, in two independent populations: individuals assigned as females at birth and individuals assigned as males at birth, considering significant a P-value lower than .05. The allele and genotype frequencies were analyzed by the x2 test. The strength of the associations with GI was measured by binary logistic regression, estimating the odds ratio (OR) for each genotype.

Statistically significant differences were found in 26 out of 242 mitochondrial polymorphisms ($P \leq 0.05$), but only the Affx-34461653 polymorphism passed Bonferroni correction. This polymorphism is related to the MT-ND4 and MT-ND5 genes that are linked to the effects of oxidative phosphorylation [68]. MT-ND5 interacts with glutamine synthetase (GS) that predominates in the brain, kidney, and liver [69].

In the brain, glutamine synthetase participates in the metabolic regulation of glutamate, in the recycling of neurotransmitters, and the termination of their signals [70, 71]. Glutamine synthetase is an ATP-dependent enzyme found in most species that synthesizes glutamine from glutamate and ammonia. In the brain, glutamine synthetase is primarily located in astrocytes where it works to maintain the glutamate-glutamine cycle as well as nitrogen metabolism. More recent studies indicate that glutamine synthetase may also be present in other CNS cells, including neurons, microglia, and oligodendrocytes [69].

It is estimated that 95% of excitatory neurotransmission in the brain occurs in dendritic spines, and AMPA/kainate glutamate and NMDA receptors are found in a high proportion on the surface of these structures. Furthermore, in the adult mammalian brain, the expression of male sexual behavior correlates with high concentrations of extracellular excitatory glutamate in the preoptic area POA [72]. Blocking the NMDA receptor and, consequently, glutamatergic transmission in this brain region (POA) reduces male sexual behavior in mice, including the number of mounts and intromissions, and does not allow improvement of these measurements with experience [73], while increasing synaptic glutamate has the opposite effect, improving male sexual performance.

Therefore, given the theoretical importance of glutamatergic neurotransmission in adult male sexual behavior, the mitochondrial genes MT-ND4 and MT-ND5 could be involved in the genetic basis of GI. Thus, it has been shown that estradiol induces glutamate release in the hypothalamus to promote defeminization [9]. The ventromedial nucleus (VMN) located in the mediobasal hypothalamus (MBH) is a key brain region for the control of female sexual behavior in mice [74, 75]. Ventromedial nucleus (VMN) neuron dendrites in males branch more frequently and therefore generally have more synapses than females [76–78].

Estradiol induces both masculinization and defeminization in mice but through different cellular mechanisms. In the MBH, estradiol-induced defeminization begins with rapid (~1 hour) activation of ER-mediated PI3 kinase and enhanced release of presynaptic glutamate. The increase in synaptic glutamate leads to increased activation of postsynaptic NMDA receptors followed by dendritic branching and the construction and stabilization of dendritic spines [79]. These results demonstrate that estradiol-mediated brain sexual differentiation is not an autonomous cellular process in which only ER-containing neurons change morphology in response to

steroid exposure. Instead, a neurotransmitter serves as a signaling factor that causes a morphological change in an entire network of cells, suggesting that all neural inputs to sexually differentiated brain regions, such as POA and VMN, are considered and interpreted according to the sex of the individual, regardless of whether the incoming signals are relevant to sex or other functions of the POA. Both the POA and the VMN are implicated in many other functions, including maternal behavior, temperature regulation, and feeding, to name a few [9].

6. Conclusions

In conclusion, our results have shown that mitochondria could play a role in the genetic basis of GI. Furthermore, our data continue to support the hypothesis that GI is a complex multifactorial trait, involving intricate interactions between sex steroids, sex steroid receptors, coactivators, and epigenetics. In addition, mitochondria now come into play as one more factor that could intervene in this complex process through the action of glutamate.

Furthermore, we can conclude that people who question their gender need protection against discrimination, high-quality services, and clear information. In addition to discovering the biological basis of GI, it is necessary to train health professionals to deal with GI. In conclusion, we can say that more studies are needed to give an adequate explanation of the factors associated with GI.

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Conflict of interest

The authors declare no conflict of interest.

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Section 4

Sex and Sexual Health Education

Chapter 5

The School's Climate as a Mediator between the Principal's Personality and the Attitude toward Sex Education in the Arab Sector in Israel

Yaser Awad, Shadia Oudeh, Tareq Murad and Jennifer Sheffield

Abstract

This study examined the school climate as an intermediary between the principal's personality and the attitude toward sex education in the Arab sector. The main research question was to what extent can the school climate mediate between the personality and the principal's attitude toward sex education, in the Arab sector in Israel? The study involved 128 principals from the Arab sector in northern Israel. The principals answered four questionnaires: organizational climate, personality characteristics, sex education, and a demographics questionnaire.The findings of the study showed a relationship between the level of openness and extroversion of school principals and their attitudes toward sex education. As for the extroversion index, it was found that the relationship was positive among male principals and negative among female principals. The findings also showed that the personality of the school principal is mediated by the school climate when examining the extroversion measurement only. It was further found that the school climate does not mediate a change between the level of openness and the principal's attitudes toward sex education. These results can be useful for decision-makers, such as the Ministry of Education and management training institutions, for evaluating and delivering training for in-service principals.

Keywords: school's climate, principal's personality, sex education, Arabs

1. Introduction

Still a relatively new concept, sex education has historically, and still today, brought opposition concerning its engagement [1]. Sex education is the provision of reliable and comprehensive information about sexuality and sexual development and the concrete answers to the youth's questions and problems. Sex education can be seen as a significant part of the social process of youth. Throughout adolescents' sexual education in the family, at school and among their peers, they acquire behaviors,

habits, virtues and attitudes regarding sex and sexuality, solidify their sexual identity and address the accepted values in society. Today's society is a dynamic as there are changes in the traditional nuclear family structure, in accepted sexual identity and in gender roles. Youth are experiencing accelerated physical and emotional development associated with, among other things, increased exposure to content and information about sexuality by various means, some of which adults' control over is limited [2].

Firstster and Lapidot-Berman [3] emphasize that in recent years the Israeli media has flooded the public with many issues related to the ugly expression of human sexuality: sexual violence, child sexual abuse, sexual harassment; obscene acts and rape; children and teens using smartphones to send sex messages and distribute videos showing themselves naked or having sex. These situations require parental and educator involvement, and raise the question of sex education in schools as a targeted factor for healthy sexuality [4, 5].

However, parents and the education system ignore parental responsibility for educating, especially regarding sex education [6]. Accordingly, the school has an essential role in shaping student sexual identity, and the school principal is one of the main factors influencing the school's sex education. After all, the principal is responsible for all the pedagogical actions and organizational processes, and is decisive in determining the school's path. Moreover, the principal is expected to develop a positive learning climate and to develop and improve existing programs [7].

The significance of the study comes from the need to raise the important issue of sex education on the educational agenda in Arab society. Sex education is rarely researched in the Arab-Israeli community, and this study is among the first to examine this issue.

2. Review of related literature

2.1 Sex education and explanation

More than the biological explanation, sex education is defined as a learning process in which the topics of sexual reproduction, sex, sexual identity and gender are studied, as well as other aspects related to human sexual behavior.

Weisblai [2] defined sexuality as an essential component in the healthy development of children and adolescents. A person's attitudes about sexuality and their sexual behavior form from infancy and throughout adolescence. This learning is influenced by the accepted customs, norms and laws in the child's community, which differ in every society and period. The World Health Organization defines human sexuality as a central part of a person's being, and it includes gender identity and sexual orientation. Sexuality is expressed in thoughts, fantasies, desires, beliefs, values, and behaviors [3].

"Sexual information" is the information transmitted about the biological, psychological, and social aspects of sex and sexuality. The emphasis is on providing information, conveying an objective opinion and a concrete and factual answer to the questions of the target audience, without an educational message and intentional values. However, even neutral information is loaded with worldviews, ideologies and value messages. For example, it has been found that in biology texts, there are stereotypes and prejudices regarding relationships and the familial and societal roles of the sexes.

Education and explanation are inseparable because education is based on information and opinion in order to cultivate youth awareness and direct them appropriately.

Yet some see that education and information are a means of identifying and preventing psychosexual problems that "disturbed" parents cause the young child. Some see it as a means of strengthening family values; others, as a means of instilling order, obedience, discipline, and conformity. For today's educator, the concepts of sex education may relate issues such as life skills, safe sex, preventing the spread of infectious disease (such as HIV/AIDS), developing mutual respect, preventing abuse, and normalizing different lifestyles [8].

Firstster and Lapidot-Berman [3] argue that sex education contributes to shaping children's attitudes toward issues of sexuality. However, sex education, due to its values and moral questions, provokes disagreements between policymakers, educators, and parents about its nature and content. Although there is no consensus regarding the need for sex education, views have changed over time and there is less debate about whether a school should engage in sex education [2].

2.2 Sex education in Israel

The Israeli sexual education class is somewhat new, and the education system has recognized the need to provide clear, up-to-date, and authoritative information sensitively, and may be a decisive factor in youth sexual behavior [9]. The assumption was that sex education programs could effectively solve social problems, including premarital sex and sexually transmitted diseases, while also promoting sexuality and well-being education [8].

Two Israeli ministries are responsible for sex education, but do not have supervisory and enforcement authority:

1. the Ministry of Education—in charge of preparing and assimilating curricula such as "Life Skills" programs through the Counseling Psychological Service Division.

2. the Ministry of Health—which operates through the Health Promotion Unit, which is responsible for providing information to students about development and sexuality [2].

In the educational aspect, the Department of Counseling Psychology emphasizes strengthening healthy sexuality to promote sexual health. This approach is based on a preventive and proactive approach and serves as the main infrastructure for the "Life Skills" program [10].

About 100 total hours are allocated to sex education programs in the entire state education system. The classes are integrated into the "Life Skills" program, with topics such as safe internet surfing, party behavior and alcohol. There are also separate classes on violence and sexual assault. Although the program is mandatory, a Ministry of Education survey confirms only 60–70% of public schools implement it. Even when implemented, only 10–20% of high schools fully comply with the program as designed. Most schools conduct one-off events or limited activities [2].

2.3 Sex education in Arab sector

The Arab population in Israel is an ethnic and cultural minority group not of immigrants, but of natives. Arab-Israelis face a constant conflict of identities consisting of: citizenship (Israeli), nationality (Palestinian), ethnicity (Arab) and

religion (Muslim, Christian and Druze). In recent years, Arab society has undergone political and socio-economic transformations, alongside processes of advancement, modernization, and education. However, despite the increase in the levels of health and education, the gap between the Arab and Jewish populations remains unchanged [11].

Transformations in Arab society affect youth to a considerable extent. Many conflicts exist between traditionalism and secularism, between the values of Western/Israeli society to which they are exposed and those of traditional Arab culture. In addition, they face the challenge combining a modern, interactive, and dynamic world with their traditional world, rooted in Arab culture. Shehadeh and Sinai [12] found differences between the experiences of Arab and Jewish adolescents, one being the linguistic expressions relating to issues of sexuality. This demonstrates the need to strengthen sex education programs in Arab society.

Public sexual discourse in Arab society, particularly among Muslims, is extremely poor. Arab schools have almost no sex education classes, and no educational institution has an orderly information system on sexuality [13]. Abu Baker [14] adds that the issue of sex education in Arab society is complex.

The Qur'an and the Sunnah addressed the issue of sex openly and clearly, emphasizing its being a human need, in addition to being a source of personal pleasure and a tool for the connection of love and kindness within marriage. However, Arab culture made the issue of sex a social taboo, limiting its discussion to the private arena. Eilwan [15] supports the claim that Islam attaches great importance to sex as a fundamental issue. That is why the "Islamic Sharia" has set norms to satisfy a person's sexual instinct. In contrast, Christianity viewed sex negatively, which could distance believers from the religion and the Church, and condemned it as sinful [16].

A large part of the sex education of adolescent Arab youth passes through conversations between peers or with older youth and by viewing pornographic and sexually explicit websites and magazines. Only a small proportion of teens receive sex education from their parents. Online sexual content does not represent reality, so such sex education may cause sexual dysfunction and violence. In 1996, the first Arabic-language sex education program was published under the title "We and Adolescence." This program discusses the issue of family life and sex education, and aims to impart knowledge and skills [16].

2.4 Sex education in schools

Harpaz [6] presents two opposing views on sex education: (1) the school is not prepared to engage in it nor is it within its role; (2) The school must address this, since ignoring the issue of sex in adolescence may fail to prevent destructive aspects of sexuality.

In most Western policies, a consensus is that sex education must be included in the curriculum and address a wide range of topics, from anatomy and physiology of the reproductive organs to gender identity, sexual orientation, prevention of sexually transmitted diseases, prevention of unwanted pregnancy, and reference to media stereotypes. It seems that structured sex education contributes to healthy sexual behavior [3].

Although some sex education curricula have been developed in Israel, their implementation is not optimal due to the lack of professionals or the lack of time and resources [17]. Even when it is included in the curriculum there is disagreement about the ages to which its content, character and goals should be directed [2].

Moreover, a sex education program should also consider the characteristics of society and the tradition of all students and teachers [18]. Abu Baker et al. [19] highlighted the issue of "Context" from the findings of research conducted among Israeli Jewish and Arab teachers and parents toward the implementation of the school's sex education program and examining their attitudes toward possible program content. They found that among teachers, there is a great awareness of sex education in both societies, in general, but in Jewish society, teachers are more aware of the existence of a sex education program and they pass the program on to students. Jewish teachers give students more freedom to make their own decisions once they are provided with the relevant information. The Arabs were found to be more supportive than their Jewish counterparts in setting boundaries on the issue of sex. They also expressed more concerns about discussing contraception, lest it encourage students to have sex. The results among Arab and Jewish parents showed large differences in attitudes toward sex education at cultural, social, sexual, and religious levels.

One of the major factors influencing sex education in a school is the school principal. According to Zak [20], the management style is an influential factor in the school. There is a connection between the dimension of leadership and characteristics of the organizational structure on the one hand, and of attitudes on the other.

Anyone in the school can propose sex education. The school principal has a significant responsibility regarding proposals for and implementation of sex education programs. Accordingly, the school principal's personality has a lot of influence. An important personality theory that has received a great deal of research is the five-factor model known as Big-5: The Model of 5 Factor Personality [21].

2.5 The five-dimensional model of the personality-Big-5

Hilgard and Watkinson [22] defined personality as a configuration of individual traits and behaviors that determine an individual's unique adaptations to their environment. This includes typical patterns of thought, emotion, and behavior that are unique to each person.

The five factors in personality are actually broad axes of personality lines, which incorporate specific traits and behaviors that make them up. The theory addresses the following five personality types:

1. Neuroticism—on the first side of the dimension, nervousness results from an unsuccessful experience, or from negative emotions such as sadness, fear, anger and guilt. On the other side of this dimension, there is serenity and relaxation. The axis describes adaptation in the face of emotional instability.

2. Extraversion—a person with a high level of extroversion is energetic, cheerful, and interested in a relationship. Such a person can be perceived as domineering, assertive, condescending, forceful, and inconsiderate of others. Yet a person with a low extroversion level is perceived as withdrawn, alienated, and not interested in a relationship. Therefore, this trait depends on the amount and intensity of interpersonal interaction, the need for stimuli, and the ability to experience joy.

3. Openness—the tendency to actively seek out experiences, and to evaluate experiences for themselves. Open-minded people are creative, inquisitive,

curious, and attentive. In contrast, closed-minded people are defined as rigid and ignoring others' arguments.

4. Agreeableness—a person's interpersonal position on the continuum between compassion and antagonism in thoughts, feelings, and actions. A person with high pleasant qualities is described as an altruistic, self-confident, person who knows how to create a good atmosphere and a good relationship with the other. In contrast, a person with low pleasant qualities is described as cynical, harsh, and hostile, and of a competitive nature. Such a person creates barriers to constructive communication.

5. Conscientiousness—the organization, perseverance, and motivation of a person in purposeful behavior and creates a continuum between trustworthy, strict people and lazy, sloppy people. A conscientious person is characterized by qualities like obedience, order, a well-developed sense of justice. Lacking conscience can be expressed in a lack of caring for others' needs.

It should be remembered that these are continuous dimensions, not dichotomous features, so the definition of each person consists of combinations to varying degrees [21]. Since it is not to be expected that all these features will characterize every school principal, researchers have tried to characterize typical principals; in reality, each principal's style is as unique as fingerprints [23].

An important variable that links the school principal's personality to her or his attitude toward teaching sex education is the school climate. "Attitudes are a set of beliefs, feelings, inclinations, views, how an individual reacts when faced with a particular occurrence or situation, which require or provoke a reaction or reference. Because attitudes originate in the basic structure of personality, they cannot be changed by conventional means" ([24], p. 20).

2.6 The school climate

The school climate is a set of environmental qualities: ecology, atmosphere, the social system in the organization and its culture [23]. The organizational behavior of schools can be described as:

1. Each school defines its own goals, even though there are general goals and guidelines for the entire education system.

2. The principal of the school can shape the character of the institution according to their personal views and inclinations [25].

There are several approaches to defining the organizational climate, but the dominant one today perceives climate as the quality and frequency of the interactions between the members of the organization and themselves and between them and the parents and students. The climate is expressed in words like warm, cold, interpersonal, hostile, harsh and closed, and is defined according to the characteristics of the schoolwork environment. The organizational climate consists of four dimensions:

1. The physical and material dimension in the organization.

2. The social dimension of the people in the organization.

3. The organizational and managerial structure of the organization.

4. The school culture, which relates to the values, beliefs, norms, and ways of thinking that characterize the teachers and principal [7].

The most famous measurement in the school's organizational climate is attributed to the work of Halpin and Croft [26], who asked teachers to describe the behavior of peers and principals, referring to the frequency with which certain behaviors occur in school. From these indices emerges a picture of "Open Climate" and "Closed Climate". The open climate is characterized by cooperation and mutual respect within the teachers' classroom and between the teachers and the principal. The principal listens to the teachers' suggestions, gives positive feedback and respects the professional ability of the staff. S/he gives teachers great autonomy and avoids the use of bureaucratic control over their work. Similarly, teacher behavior allows for open professional interaction between teachers; teachers form a close social group, and they are committed to their work in the school.

In contrast, the closed climate is the opposite of the open climate. The principal in this climate sets a particular routine that is obligatory for all teachers and students. Teachers generally react negatively and show low commitment to the school and the educational process. The principal uses rigid managerial control without professional support and hinders team development [7].

Therefore, the best qualities of the school principal, as noted by Bar-Lev [23] are: decisiveness, consistency, authority, patience and proper judgment of people and situations. But at the same time, they must listen to and consult with others, delegate powers and give praise and encouragement to subordinates. They also create a shared vision, maintain a learning atmosphere for students and staff, manage an environment that is safe and effective for the public, maintain good relations with parents and key people in the community, act honestly, fairly and ethically toward all; and influence the system politically, socially, economically, legally and culturally.

2.7 The purpose of the study

The purpose of the present study is to examine to what extent can the school climate mediate between the principal's personality and attitude toward sex education in the Arab-Israeli sector.

The research hypotheses derived are:

1. There is a connection between the personality of the school principal and their attitudes toward sex education, so that the less neurotic and more extroverted, open, pleasant, and conscientious the school principal is, the more positive their attitudes toward sex education will be.

2. The school climate will mediate between the principal's personality and their attitudes toward sex education, so the less neurotic and more extroverted, open, pleasant, and conscientious the principal is, the more positive the school climate will be. On the other hand, the more positive the school climate, the more positive the principal's attitudes toward sex education.

3. Methodology

3.1 The research method

This study is based on the quantitative research approach, which assumes that knowledge is "there," awaiting discovery, and the researchers' role is to be "objective" and not allow their views, values, and beliefs to penetrate the research process. "Epistemologically quantitative research is deductive and affirmative" ([27], p. 210).

3.2 The sample population of the study

The study population is 128 principals in Arab public schools in the Northern District of Israel. **Table 1** shows that 64.8% of the study participants are men and 35.2% are women. The participants were aged 25 and over, with the majority being 45-55 years. In addition, most principals were married (85.2%) but some were single (7.0%) or divorced (6.3%). Muslims (54.7%), Druze (24.2%) and Christians (18.0%) participated in the study, with most participants being secular (43.0%) or traditional (47.7%).

3.3 The research variables

1. Personality Traits—Consists of five subvariables: extroversion, neuroticism, pleasantness, conscientiousness, and openness.

2. School climate—Consists of seven subvariables: openness, effort, environment, encouragement, self-feedback, recognition of success and consistency.

3. Sex education variable—Consists of three subvariables: severity, influence and general.

In general, the subvariables when the value is higher indicate the dominance of the attribute.

3.4 Research instruments

Four questionnaires were used in this study:

1. High School Organizational Climate Questionnaire—H-S Organizational Climate Index (Appendix B).

   This questionnaire is for principals, and it has undergone many incarnations. First developed by Halpin and Croft [26], "The Descriptive Questionnaire of the Organizational Climate", it focused on measuring the important aspects of teacher-teacher and teacher-principal relationships. The 1989 questionnaire belongs to a research team from the University of Memphis and includes 30 items, which are divided into seven dimensions:

   a. An open school climate in relation to teachers.

   b. The efforts of teachers to work beyond what is required in the definition of their role.

Variables		*N*	%
Gender	Male	83	64.8
	Female	45	35.2
Age	25–35	8	6.3
	35–45	30	23.4
	45–55	68	53.1
	+55	22	17.5
Marital status	Single	9	7.0
	Married	109	85.2
	Divorced	8	6.3
	Widower	2	1.6
Religion	Muslim	70	54.7
	Christian	23	18.0
	Druze	31	24.2
	Other	4	3.1
Religion measure	Secular	55	43.0
	Traditional	61	47.7
	Religious	12	9.4
Education	First degree	21	16.4
	Second degree	92	71.9
	Third degree	13	10.2
	Other	2	1.6
School level	Elementary	49	38.3
	Intermediate	32	25.0
	High	24	18.8
	Other	23	18.0
Locality type	City	42	32.8
	Village	83	64.8
	Other	3	2.3

Table 1.
Demographic and professional characteristics of the principals in the sample.

c. A school environment that allows the teacher to behave optimally when encountering the inappropriate behavior of his students.

d. Providing the opportunity and encouragement for teacher personal responsibility.

e. Self-feedback so that a teacher will be encouraged by the school environment to examine his or her behavior as a source of problems in the school without being harmed by it.

f. Recognition of success, which is the extent to which the school rewards one of its teachers, incentivizes hard work.

g. The degree to which teachers adhere to and enforce school guidelines.

The answers to the questionnaire are on a five-point Likert scale (5—strongly agree, 4—agree, 3—neutral, 2—disagree, 1—do not agree at all, 0—I have no opinion or the statement is irrelevant). Examples of items, "In my opinion, in the environment of this school I am encouraged to exchange information about solving school problems"; "In my opinion, in the environment of this school I am encouraged to improve school programs" ([23], pp. 188–189). For each index, the average of the items is calculated.

2. Big Five Index Questionnaire (BFI) (Appendix C)—The questionnaire belongs to McCare and John [28] and consists of 44 items answered through a 5-grade Likert scale where 1 means "do not agree at all" and 5 means "strongly agree"; the items are 5-dimensional characteristics of the various individual traits (**Table 2**). The following are examples of statements—Openness: "An original person who tends to come up with new ideas", with Cronbach's alpha internal consistency of .70. Conscience: "An employee who performs his/her job well" with .80. Pleasantness: "Tends to criticize and find flaws in others", with .68. Neuroticism: "Man is depressed and prone to sadness", with .81. For each index, the average of the items is calculated.

Characteristic factor	Representation in the characteristic scale	Representation in the characteristic scale
Openness	Original	Routine
	Courage	Not adventurous
	Liberal	Conservative
Conscientiousness	Careful	Careless
	Reliable	Unreliable
	Conscience	Irresponsible
Extraversion	Social	Solitary
	Talkative	Calm
	Spontaneous	Self-control
Agreeableness	Good temperament	Nervous
	Soft hearted	Tough
	Lacking selfishness	Selfish
Neuroticism	Worried	Calm
	Vulnerable	Durable
	Lacking confidence	Confident

Table 2.
Examples of characteristic scales for each of the five dimensions of individual attributes.

3. Sex Education Questionnaire (Appendix D)—The 3-dimensional questionnaire belongs to Blendon [29] and includes 30 questions that examine attitudes toward sexual aspects, and sex education in students:

    a. Attitude toward the problematic nature of sexual aspects: Answer for the eight items by an ordinary scale with 5 levels so that 1—no problem at all, 2—small problem, 3—average problem, 4—big problem, 5—very big problem. Example question: "Unwanted pregnancy." A high rating of this dimension means an expression of the degree of severity of the attitude toward sexual aspects.

    b. The extent of the effect of sex education on the same sexual aspects mentioned in the previous section, by a 5-level Likert scale, so that 1—does not affect at all, 2—does not affect, 3—affects moderately, 4—affects, and 5—very much affects. Example question "To what extent does sex education affect the issue—unwanted pregnancy"? A high rating of this dimension means a high impact of sex education on sexual aspects.

    c. Answer regarding the degree of agreement for 14 statements, by a 5-level Likert scale, so that 1—do not agree at all, 2—do not agree, 3—neutral, 4—agree, and 5—strongly agree. Example question, "To what extent do you agree with the statement—having sex between adults before marriage is immoral"? A high rating of this dimension expresses a more positive perception toward sexual behavior and sex education.

Questionnaire	Dimension	Average (S.D.)	Cronbach alpha
Questionnaire personal characteristics:	Extroversion	3.62 (0.44)	0.50
	Neuroticism	2.36 (0.50)	0.60
	Pleasantness	3.89 (0.51)	0.62
	Conscientiousness	4.24 (0.52)	0.76
	Openness	3.98 (0.46)	0.68
School climate questionnaire	Openness	4.08 (0.63)	0.85
	Effort	4.11 (0.63)	0.79
	Environment	3.93 (0.65)	0.72
	Encouragement	3.55 (0.68)	0.47
	Self-reflection	3.38 (1.02)	0.67
	Recognition of success	3.21 (1.10)	0.77
	Consistency	3.29 (0.77)	0.46
Sexual education	The severity of the position	3.89 (0.62)	0.74
	Effect of sex education	3.79 (0.66)	0.85
	Behavior perception and sex education	2.97 (0.53)	0.75

Table 3.
Mean, standard deviation, and Cronbach alpha values for all dimensions in the study.

In addition, subjects were asked about their age, gender, marital status, years of education, and degree of religiosity (Appendix A).

Table 3 shows the summary of dimensions, their level of reliability.

3.5 Research process

There was an application to an academic institution for its approval to distribute the questionnaires to the principals in its professional development courses. After receiving the approval, the questionnaires were distributed at the principals' meetings and the purpose of the research and the expected results were presented. The data collection procedure was spread over several weeks. All data were collected by the researchers.

3.6 Ethics in research

Care was taken to properly address the principals nominated for participation. School principals were recruited in person at their workplaces or study groups. After receiving their consent to participate in the study, they were given a brief explanation of the study purpose and were promised confidentiality and anonymity regarding their personal details, then asked to complete the questionnaires. Some principals refused to fill out the questionnaire, so it was explained to them that they were free to discontinue their participation in the study at any stage and of their own free will, and that their non-participation would not affect them and their status in any way. They were also assured that the data and findings would be used for academic research and would not be passed on to any official.

4. Findings

The purpose of the present study is to examine the extent to which the school climate can mediate between the personality and the principal's attitude toward sex education in Arab society in Israel.

The hypotheses examined in this study are:

1. There is a connection between the personality of the school principal and their attitude toward sex education, so that the less neurotic and more extroverted, open, pleasant, and conscientious the school principal is, the more positive her or his attitudes toward sex education will be.

2. The school climate will mediate between the principal's personality and their attitudes toward sex education, thus the less neurotic and more extroverted, open, pleasant, and conscientious the school principal is, the more positive the school climate will be. Conversely, the more positive the school climate, the more positive the principal's attitudes toward sex education.

First hypothesis: there is a connection between the school principal's personality and their attitudes toward sex education, so that the less neurotic and more extroverted, open, pleasant, and conscientious the school principal is, the more positive their attitudes toward sex education will be.

Subgroups		Dimensions of sexual education	Characteristic factor	
			Openness	**Extroversion**
Total		Perception of behavior and sexual education	0.255**	—
Gender	Men	The impact of sex education	—	0.226*
	Women	The impact of sex education	—	−0.318*
	Women	Perception of behavior and sexual education	0.324*	—
Religion	Muslim	The severity of the attitude	−0.245*	—
	Druze	The impact of sex education	—	0.368*
Religiousness	Secular	Perception of behavior and sexual education	0.445***	—

*P < 0.05.
**P < 0.01.
***P < 0.001.

Table 4.
Pearson's correlation coefficients between school principal personality and sex education.

To examine the relationship between the school principal's personality and their attitudes toward sex education, Pearson's correlation coefficient was used to examine the nature of the relationship between the variables measured (**Table 4**). It was found that there was a positive relationship at a moderate and significant level (Rp = 0.255, $P < 0.004$) between the level of openness measured in the personality questionnaire and the perception of behavior and sexual education. So, the more the principal is characterized by a developed imagination, curiosity, originality, broad horizons, high intelligence, and artistic sensitivity s/he tends to perceive sexual behavior and education more positively. In contrast, no correlation was found between the other dimensions of personality (extroverted, neurotic, pleasant or conscientious) and the dimensions of sex education.

Moreover, when examining the relationship by gender, it was found that among men only there is a positive and significant moderate relationship (Rp = 0.226, $P < 0.040$) between the level of extroversion of principals and the effect of sex education. That is, the more social principals have a need for connection, assertiveness, and a tendency to be active and talkative, the higher they rank the importance of the impact of sex education in school. It is important to note that no relationship was found between the level of openness and the attitude toward the dimensions of sex education among male principals. When we examine the relationship between the personality dimensions of principals and the dimensions of sex education, it is found that there is a moderate and significant negative relationship (Rp = −0.318, $P < 0.033$) between the level of extroversion of principals and the effect of sex education in school.

However, the more extroverted female principals are, the more likely they are to think that the impact of sex education in school is low. In contrast, a moderate and significant positive relationship was found (Rp = 0.324, $P < 0.030$) between the level of openness of female principals and the perception of behavior and sex education, so principals with a more open personality dimension significantly tend to perceive sexual behavior and education in a more positive way.

The study examined the impact of religion on the perception of sex education. Among Muslims, there is a moderate and significant relationship (Rp = −0.245, $P < 0.041$) between the level of openness and the severity of the attitude toward

sexual aspects. In fact, it has been found that conservative Muslim principals tend to rate the severity of acts (e.g., unwanted pregnancies, sexually transmitted infections, etc.) more severely than what open-minded principals rated them.

Among the Druze principals, it was found that there was a moderate and significant positive relationship (Rp = 0.368, $P < 0.041$) between their level of extroversion and the effect of sex education. This means that the more extroverted the Druze principals are, the higher they rank the importance of the impact of sex education in the school. Among Christian principals, there is no relationship between their personality dimensions and their attitude toward sex education.

Finally, it was found that there is a positive and significant relationship (Rp = 0.445, $P < 0.0001$) between the level of openness and perception of behavior and sexual education. The more secular principals with a higher level of openness tend to perceive sex education in a more positive way. In contrast, no association was found between personality dimensions and attitudes toward sex education among the traditional or religious.

Second hypothesis: The school climate will mediate between the principal's personality and her/his attitudes toward sex education, so that the less neurotic and more extroverted, open, pleasant, and conscientious the school principal is, the more positive the school climate will be. On the other hand, the more positive the school climate, the more positive the principal's attitudes toward sex education.

To examine the degree of mediation of the school climate between the components of personality and the attitudes toward sex education, the Sobel test was used.

To test the hypothesis that the school climate will mediate between the principal's personality and their attitudes toward sex education, the relationship between the school climate and the principal's personality was first examined (**Table 5**). It was found that there is a strong positive and significant relationship between the level of extroversion of the principal and the level of openness of the school (Rp = 0.525, $P < 0.0001$), the effort to succeed at work (Rp = 0.389, $P < 0.0001$), a supportive school environment (Rp = 0.440, $P < 0.0001$), encouragement for personal responsibility (Rp = 0.275, $P < 0.0002$), self-feedback (Rp = 0.178, $P < 0.045$), and consistency (Rp = 0.178, $P < 0.044$).

School climate	Dimensions of personal qualities				
	Openness	Conscientiousness	Pleasantness	Neuroticism	Extroversion
The level of openness in the school	0.447***	0.307***	0.198*	—	0.525***
Effort to succeed	0.347***	0.195*	0.201*	—	0.389***
Supportive school environment	0.422***	0.211*	—	—	0.440***
Encouragement for personal responsibility	—	—	—	—	0.275***
Self-feedback	—	—	—	0.248***	0.178*
consistency	—	—	—	—	0.178*

*P < *0.05.*
**P < *0.01.*
***P < *0.001.*

Table 5.
Pearson's correlation coefficients between school principal personality and school climate.

The level of neuroticism of the school principal was found to be positively and significantly associated (Rp = 0.248, $P < 0.0001$) with self-feedback. The degree of pleasantness expressed in courtesy, flexibility, confidence and trust, comfortable temperament, cooperation, forgiveness, and tolerance, was found in a positive and weak correlation with the level of openness of the school (Rp = 0.198, $P < 0.025$), and the effort to succeed at work (Rp = 0.201, $P < 0.023$). The level of conscientiousness of the principal was found to be positively correlated with the level of openness of the school (Rp = 0.307, $P < 0.0001$), effort to succeed at work (Rp = 0.195, $P < 0.027$), supportive school environment (Rp = 0.211, $P < 0.017$). Finally, the level of openness of principals was found to be highly and positively correlated with the school climate dimension, such as the level of openness of the school (Rp = 0.447, $P < 0.0001$), effort to succeed at work (Rp = 0.347, $P < 0.0001$), and a supportive school environment (Rp = 0.422, $P < 0.0001$).

When examining the relationship between the school climate and sex education (**Table 6**), it was found that there is positive relationship between the openness of the school climate and the perception of behavior and sex education (Rp = 0.181, $P < 0.040$). There is also a positive and significant relationship between the openness of the school climate and the effect of sex education (Rp = 0.239, $P < 0.007$). It was also found that there is a positive relationship between the effort to succeed at work and the perception of behavior and sexual education (Rp = 0.238, $P < 0.007$). Also, a positive and significant relationship was found between the effort to succeed and the effect of sex education (Rp = 0.189, $P < 0.033$).

Another positive relationship was found between the structure of the school environment and the perception of behavior and sexual education (Rp = 0.196, $P < 0.026$), and the effect of sex education (Rp = 0.231, $P < 0.009$). Similarly, a positive association was found between the recognition of success and the perception of behavior and sex education (Rp = 0.252, $P < 0.004$), and the effect of sex education (Rp = 0.266, $P < 0.002$). Finally, a positive and significant relationship was found between the consistency of the structure and the perception of behavior and sexual education (Rp = 0.204, $P < 0.021$), and the effect of sex education (Rp = 0.300, $P < 0.001$).

To examine whether the school climate mediates between the principal's personality (in dimensions: openness, extroversion) and sex education (in dimensions: behavioral perceptions and sex education, the effect of sex education) a linear regression analysis was performed when the two principal personality variables (in the two dimensions above) and school climate are independent variables and sex education (in both dimensions above) as a dependent variable. Notably, the two dimensions of sex education examined in this hypothesis are those that were dominant in their correlation with the two dimensions of personality traits (**Table 4**).

The following are the options tested through the Sobel test:

1. When the effect of the openness dimension on the "perception of behavior and sexual education" dimension in the regression model in all principals was examined, it was found that the regression coefficient value of the openness dimension is positive and significant ($B = 0.255$, $P < 0.004$). When the dimensions of the school climate are added, it is found that the effect of the openness dimension increases (B = 0.385, $P < 0.0001$). After adding the dimensions of the school climate, the explained variance of the model increased (Rp = 0.382, $P < 0.001$). Therefore, the school climate dimensions do not mediate the relationship between the dimension of openness and the dimension of "perception of behavior and sexual education", but rather the dimensions of

School climate	Sex education	
	Perception of behavior and sexual education	Impact of sex education
The level of openness at school	0.181*	0.239**
Effort to succeed	0.238**	0.189*
Supportive school environment	—	0.231**
Encouragement for self-responsibility	—	—
Self-feedback	—	—
consistency	0.204*	0.300**
Recognition of success	0.266**	—

*P < 0.05.
**P < 0.01.

Table 6.
Pearson's correlation coefficients between sex education and the school climate.

the school climate make a unique contribution to the regression model among all principals.

2. When the effect of the extrovert dimension on the "sex education effect" dimension among male principals only was examined, it was found that the regression coefficient of the extruder dimension was positive and significant ($B = 0.226$, $P < 0.040$). When the dimensions of the school climate are added, it is found that the effect of the extrovert dimension is small and no longer significant ($B = -0.039$, $P > 0.750$). Therefore, the school climate dimensions mediate the relationship between the extroversion dimension and the "impact of sex education" dimension among male principals.

3. When the effect of the extrovert dimension on the "effect of sex education" dimension among Druze principals was examined only, it was found that the regression coefficient of the extruder dimension was positive and significant ($B = 0.368$, $P < 0.041$). When the dimensions of the school climate are added, it is found that the effect of the extrovert dimension is small and no longer significant ($B = -0.233$, $P > 0.299$). Therefore, the school climate dimension mediates the connection between the extroversion dimension and the "impact of sex education" dimension among Druze principals.

4. When the effect of the openness dimension on the "perception of behavior and sexual education" dimension among secular principals only was examined, it was found that the regression coefficient of the openness dimension was positive and significant ($B = 0.445$, $P < 0.001$). When the dimensions of the school climate are added, the effect of the openness dimension increases ($B = 0.575$, $P < 0.0001$). Therefore, the school climate dimensions do not mediate the relationship between the openness dimension and the "behavioral perception and sex education" dimension, but rather the school climate dimensions make a unique contribution to the regression model among secular principals.

5. Discussion

The purpose of this study is to examine the extent to which the school climate can mediate between the personality and the principal's attitude toward sex education in the Arab-Israeli community. The study was based on the "Big Five" model. In education, the principal is perceived as a leader whose leadership depends on personal qualities and skills, including the ability to fulfill tasks [30]. Therefore, the school atmosphere is greatly influenced by the principal's behavior toward the staff and students and their parents, and even how the climate is defined as a work environment (cold, friendly, hostile, or closed).

The prevailing assumption is that the perceptions of teachers, students, parents, and principals of the social, physical and pedagogical environments in the school may influence the school's educational processes, outputs, and outcomes. Recognition of these perceptions is important for school principals, who are required to control the organizational processes and discover the areas in which intervention is needed to improve the school atmosphere [7].

According to Raichel [31], the principal should know the school's educational staff and students, and get to know their feelings, attitudes and needs. Tadmor [32] adds that the task of formal education is to engage in the multifaceted design of the student, on the one hand to develop the knowledge, skills, values, and behavioral aspects, and on the other hand to develop each student's unique personality.

The centrality of the school will be expressed, therefore, in that it will serve as a social agent, imparting the primary culture above and beyond its traditional functions as imparting disciplinary knowledge. In other words, the school takes on tasks that were previously taught at home. The great responsibility of the school for shaping the image of the future graduate in the modern age lies in the deteriorating state of the traditional family, the undermining of powers, and the growing pluralism of values.

Additionally, parents have an important and primary role in their children's sexual development through a process of sexual socialization in which children absorb the social norms associated with sexual behavior. Schools and health professionals must support the role of parents, and parents must support schools in promoting sex education for their adolescent children [33].

Flower et al. [34] also emphasize the need for schools to raise children who can sexually communicate directly, openly, honestly, prominently, and spontaneously. In doing so, children develop self-confidence in their sexuality with sensitivity to the needs, rights, and preferences of other people.

First hypothesis: Based on the findings, it was found that there is a relationship between the level of openness and extroversion of school principals and their attitudes toward sex education. It has been found that principals with a high level of openness tend to perceive sex education in a more positive way. Similarly, this relationship is stronger among secular principals.

This finding indicates that the dimension of high openness to experiences has a great influence on the principal's attitudes toward sex education. This is consistent with the findings in Raichel's [31] study, that a person with high-intensity traits is creative and enterprising with a penetrating vision in depth and for the long term future. A proactive person, open to change, who does not wait to be motivated, but initiates and motivates others, has broad horizons, mental flexibility, and originality. Raichel adds that successful managers have characteristics such as perseverance, creativity, openness, empathy, patience, compassion, transparency, integrity, consistency, determination, risk-taking and awareness of others and themselves.

In addition, their values are often of a social-democratic or liberal-humanist nature and aimed at equal opportunities. Therefore, the principal's liberal nature promotes tolerance toward the different, for example, students with same-sex orientation [3].

About secular principals, it was found that there is a strong connection between their level of openness and their attitude toward sex education. This finding is consistent with the findings of Brosh [35], who found that there is a link between the level of religiosity and attitudes toward sex education: about 9% of the religious and traditional teaching students in her study underestimated the importance of sex education in school, compared to only 1% of seculars. Only about a quarter of religious and traditional students supported the provision of sex education for kindergarten and elementary school children, while about 36% of secular students supported it. Cabalion [8] also emphasizes that there is a cultural gap between the values of secular and traditional society. While secular society views sexual education as an act of progress and enlightenment, the other sees it as an expression of moral corruption.

As for the relationship between the extroversion dimension and the "effect of sex education" dimension, it was found that there is a positive relationship between them among the principals, and an inverse relationship was found among the women principals. The more extroverted male principals are, the higher they rank the "impact of sex education" dimension in school. In contrast, extroverted female principals tend to give little importance to the "impact of sex education" dimension in school.

This finding reinforces the assumption that personality traits are not dichotomous and can move along a spectrum. A person with a high level of extroversion, characterized as an assertive, energetic, cheerful, talkative, spontaneous, social person who is interested in relationships. In contrast, a person with low extroversion is perceived as withdrawn, segregated, alienated, restrained and not interested in relationships [36].

Based on the rating of the traits, it is likely that male principals with a high level of extroversion participated in the study, compared to female principals with a low level of extroversion, which created a difference in attitudes between the two sexes. This finding is inconsistent with the findings as mentioned by Brosh [35], which examined the attitudes of 135 male and female educators in the Arab sector toward education for family life and sex life. In the Arab sector there is great general support for education for family life, however, not all subjects were perceived as suitable for school.

Some researchers believe that male and female principals are different in the way they manage people and exercise their leadership, even though the differences are not innate but the result of different social processes and life experiences. Contrary to this approach, others argue that there is unequivocal evidence of gender differences in school management. Conversely, there are studies that indicate that male and female principals are not different in their professional behavior. When there are gender differences, they are marginal and concentrate mainly on the different career experiences of women and men ([7], pp. 257–258).

According to Hertz-Lazarowitz and Shapira [37], one of the weaknesses of the feminist-gender approach to understanding educational leadership stems from its disregard for environmental and cultural influences on the leader's behavior and its focus on gender as a major factor in assessing the behavior of a female school principal as an educational leader.

Abu Baker [38] argues that the issue of sex education in the Arab-Israeli education system is still subject to the personal decisions of school principals and the degree of personal courage within their communities. In most cases, principals prefer not to get

into a confrontation that will undermine their status and condemn their decisions. She added that this is due to the common assumption that sex education teaches students how to have sex, and parents see this as an obscene goal and not within the school's purview.

The very fact that the present study found a difference between the attitudes of extroverted males and extroverted female principals in the "impact of sex education" dimension in school may support the ideology of the dominant gender, which dictates the content, division of roles and social statuses. Rosen [39] mentioned that social interactions are how individuals learn what the expectations are directed at them according to their gender. Therefore, despite the controversy in the literature, gender plays some role in understanding the world of male and female principals [7]. It is possible that the extroverted female principals were reserved in their responses due to gender norms.

Among the Druze principals, a positive relationship was found between their level of extroversion and the "impact of sex education" dimension. The more extroverted the Druze principals are, the higher they rated the "impact of sex education" dimension in the school.

This finding may indicate that the Druze society has undergone great change. It was shaped for many years by religion when the social-traditional framework and living conditions determined the individual's connection to community [40]. The social situation today has changed fundamentally. Most of the young Druze men and women have opened to the modern world in institutions of higher learning, workplace and military service. What was taken for granted in the past does not today satisfy the needs of Druze youth. The traditional leadership loses its powers, with the younger generation of Druze in daily contact with Jewish society, which brings about a change in the lifestyle and views of the Druze youth. Today, young Druze often ask many and varied questions about their identity, affiliation, values, religion and more, and are not satisfied with "simple" answers. They require serious attention to their questions and concerns. The community clergy, elders, leaders, and officials are unable to provide the answers to all the questions. Community segregation further exacerbates the difficulties of dealing with the gaps between the old and the new. It highlights the conflict between the preservation of culture and unique identity and the pressures arising from modern culture ([41], p. 5).

Second hypothesis: It was found that the school climate does indeed mediate between the school principal's personality in the extroversion dimension and the "effect of sex education" dimension. However, as for the openness dimension, the school climate has not been found to mediate between the openness dimension and the "impact of sex education" dimension.

In order to illustrate these differences, we will examine the nature of the relationship between the dimensions of personality and school climate, in addition to the dimensions of sex education. The extroversion dimension was found to be positively associated with the "effect of sex education" dimension, so extroverted men tend to rank higher the "effect of sex education" dimension, as well as among Druze principals, the higher the extroversion level, the higher they rank the dimension "The Impact of Sex Education". When the dimensions of the school climate are added to the model, it is found that this relationship disappears, which indicates a full mediation of the school climate dimension, between the extrovert dimension and the "effect of sex education" dimension.

This finding reinforces the hypothesis that the more extroverted the school principal, the more positive the school climate dimensions will be, and the more

positive the principal's attitudes toward the "impact of sex education" dimension will be.

Friedman [42] argues that extroversion is the ability to turn outward, target people around the person, and show humanity and consideration toward them. This ability allows the adult to understand other people's intentions and identify their aspirations, even when they are hidden, and potentially act on that information.

Therefore, it is likely that this finding highlights the critique that focused on personal traits and did not address the work environment, which led to the existence of the situational approach. The situation approach that rejected the traits approach and the assumption that people are born leaders and began to look for unique characteristics in the work environment that influence the leader's behavior and level of performance. The situational approach claims that there are several variables that can influence a principal's behavior such as the structural characteristics of the organization, job characteristics, subordinate characteristics, external environment, and internal environment including values, level of participation, openness, culture, and school climate [7].

As a critique of the personal trait model and the situational attitude model, Opletka [7] noted that they were developed a different approach to describing and measuring the organizational climate based on understanding the need to simultaneously measure a person's traits and the characteristics of the environment in which the person lives and operates. This led to the formulation of six factors in the school's organizational climate index: (1) intellectual climate; (2) a climate of achievement criteria; (3) a climate that emphasizes personal support; (4) organizational effectiveness; (5) a climate that emphasizes order; and (6) a climate of great control over chance.

The literature review shows that the school climate is of great importance and has a profound effect on the physical and mental health of students. A positive school climate strongly influences motivation for learning, and contributes to reducing violence, bullying and sexual harassment and as a factor that protects learning and overall positive development of young people [43].

In contrast, when we examine the dimension of openness of principals, that there is a positive relationship between it and the dimension of "perception of behavior and sexual education". The same is true among the secular, the higher the dimension of openness, the more positive the "perception of behavior and sexual education". It is important to note that after the addition of the school climate dimensions, the unique contribution of the openness dimension to the regression model stood out even more. Thus, the openness dimension and the school climate dimension make a unique and separate contribution to predicting the "perception of behavior and sexual education" dimension in school, and the school climate dimension does not mediate the relationship between the openness dimension and the "perception of behavior and sexual education" dimension in school.

Friedman [42] reinforces this finding and emphasizes that a person with developed skills in human relations controls communication with others. Aware of their own positions and assumptions and those of others and able to find benefit even in possible disagreements. Such a person works to create an atmosphere of in which subordinates feel safe and free to express themselves without fear of criticism or humiliation. This person allows their colleagues and subordinates to participate in the planning of the things that directly affect them and their execution. They are aware of the motivation of the people and their needs in the organization and is considerate of all these.

Raichel [31] adds that a condition for principal leadership is to create a good atmosphere that the staff members will feel that they are in a good, necessary, valued,

meaningful, belonging place and that they have constant support. A principal can create the atmosphere in which disagreements are resolved in a conversation that one learns from the different opinions and that there is room for everyone.

6. The contribution of research to the management of the education system

The findings of the present study offered empirical evidence to support the impact of the school climate as an intermediary between the personality dimensions of the principal and the attitude toward sex education in the Arab schools in Israel. The study relied on the Big-Five model of personality and shed light on the school principal's desired traits and attitudes toward sex education in Arab society specifically.

According to Friedman [42], the principals, as head of the school, are perceived as a key accelerator in the organization's performance and largely determine its directions of development, how it is managed and organizational behavior. Therefore, the principal is must not only demonstrate technical management skills, but also skills for participatory management and building a team culture. Hence, stellar leaders are open, accessible people, expressing fairness, transparency, honesty, and aware of others; they are actually realizing in their actions the models of ideal educational leadership [7].

The study demonstrates that in addition to pedagogical education, the Ministry of Education must include sex education in its training and appointing principals. In addition, the issue of personal qualities and their empowerment can be emphasized in the training of principals (or in the framework of professional development). The combination of personal qualities (natural talent), training and experience can build a third model (hybrid) for a school principal who may be more competent and skilled in school management, since performing management tasks effectively requires the acquisition of specific skills.

7. Conclusions

1. Regarding the Big-Five model of personality, it can be concluded that the model ignores reference to situations; it does not explain why a person can behave very differently in one situation than in another. There is still controversy whether it is attitude and qualities that determine the behavior, and a situation that determines the behavior. Therefore, it is impossible to predict behavior according to a trait, because the behavior varies from one situation to another.

2. Although the attributes approach has not been successful in explaining the leadership phenomenon, it is thanks to it that studies conducted today use advanced measurement methods to identify attributes of managers in an organization.

3. Regarding the principal's tasks and responsibilities, it can be concluded that they are the result of, among other things, social, organizational and cultural arrangements. Hence, in a traditional society evolving in large steps in a wide range of fields, including social and cultural, the field of sex education cannot be arbitrary. Principals must navigate between making the subject accessible to students and accepting community engagement (e.g., parent committee).

Ignoring the field of sex education is irresponsible and could be seen as covert approval for any behavior.

4. The process of sexual socialization that begins at home by the parents is not enough to instill in children the healthy behaviors in this area. Children are exposed to community norms and misleading information, hence the need to have sex education programs in school and educate on society's norms in family and sex life, cultivate tolerance for unusual behaviors, and promote healthy and safe sexual behavior.

8. Summary

The research literature reviewed sheds light on the importance of sex education in modern schools; however, in practice, the implementation of programs in this field is partial. This topic is gaining momentum in Arab society in Israel, where the issue of sex education is culturally and ethically sensitive. It seems that while research findings indicate the role of educational counselors in promoting sex education in schools, research dealing with the role of Arab educational counselors in the subject is almost non-existent [44].

Youth are always replete with questions related to sexuality, and therefore they should be provided with answers to all the problems and clarifications to various concepts [45]. Domb [46] argues that one of teachers' concerns is that students will ask them personal questions, and they are unsure what way to answer such questions, and since the issue is emotionally charged, it turned out that "dry" information is insufficient and that every fact must undergo an emotional processing that will allow it to be internalized. Therefore, breaking down the embarrassment depends on the ability of educators and counselors to talk about the issue without getting anxious and scared.

Considering this, the professional literature places great emphasis on the principal being an innovator and a promoter of change. Various researchers have pointed out that among the tasks of a school principal are developing, supervising, and providing assistance to the staff in their work. In addition, principals are expected to cultivate a supportive work environment.

Therefore, the principal is now required not only to present technical management skills, but to perform management tasks in an effective manner that requires the acquisition of specific skills, including in sex education. At the same time, the lack of a theoretical framework that clearly defines the skills required of those involved in school management leaves room for different approaches in the training of principals [7].

A. Demographic questionnaire

No. of examinee: _____

Research on School Climate

Dear Participant,

My names are _____ from Advanced Studies Unit in Sakhnin College. The research we are conducting deals with the school climate as a mediator between the personality and the position of the principal towards sex education in the Arab sector. The data is collected anonymously and will not be passed on to any other party.

Your participation is a great contribution to our research.

Thank you from the bottom of my heart for your cooperation!
The research team
Personal details questionnaire
Circle the appropriate digit:
Sex: (1) Male (2) Female
Age: (1) 25 -35 (2) 35-45 (3) 45-55 (4) 55 and up
Marital Status: (1) Single (2) Married (3) Divorced (4) Widowed
Religion: (1) Muslim (2) Christian (3) Druze (4) Other
Degree of religiosity: (1) secular (2) traditional (3) religious
Education: (1) Bachelor (2) Master (3) Ph.D. (4) Other
Principal: (1) Elementary School (2) Secondary School (3) High School (4) Other
Seniority in management: (1) 1-3 years (2) 4-10 years (3) 11-20 years (4) 21 years and over
In what type of locality do you live: (1) city (2) village (3) other

B. School climate questionnaire

Answer the statements according to the degree to which you agree with each of them.
Levels: 5 = Strongly agree, 4 = Agree, 3 = Neutral (neither agree nor disagree), 2 = disagree, 1 = strongly disagree, 0 = I have no opinion or the statement is irrelevant

	No opinion/ Irrelevant 0	**Strongly disagree 1**	**Disagree 2**	**Neutral 3**	**Agree 4**	**Strongly agree 5**
1. In my opinion, in the environment of this school I am encouraged to use consistent ways to treat students who regularly break the rules						
2. In my opinion, in the environment of this school I am encouraged to consider whether my role is one of the causes of school problems						
3. In my opinion in the environment of this school I am encouraged to examine the performance of my work						
4. In my opinion, in the environment of this school I receive a special reward when my work is done exceptionally						
5. In my opinion, in the environment of this school I am encouraged to express my opinions about school problems						
6. In my opinion, in the environment of this school I am encouraged to trust my personal judgments when I make routine day-to-day decisions						
7. In my opinion, in the environment of this school I am encouraged to collect data and process them for my work						

	No opinion/ Irrelevant 0	**Strongly disagree 1**	**Disagree 2**	**Neutral 3**	**Agree 4**	**Strongly agree 5**
8. In my opinion, in the environment of this school I am encouraged to see in my actions/opinions possible causes of problems in the school						
9. In my opinion, in the environment of this school I am encouraged to trust my personal feelings in decision making						
10. In my opinion, in the environment of this school I am encouraged to check with others before I deviate from the existing school guidelines						
11. In my opinion, in the environment of this school I am encouraged to consider the school regulations when I make decisions						
12. In my opinion, in the environment of this school I am encouraged to reward students for effective performance						
13. In my opinion, in the environment of this school I am encouraged to make personal decisions in response to problems related to my professional roles						
14. In my opinion, in the environment of this school I am encouraged to take responsibility for improving the school						
15. In my opinion, in the environment of this school I am encouraged to take fair, determined and consistent steps when school regulations are violated						
16. In my opinion, in the environment of this school I am encouraged to work “beyond what is required in the job definition"						
17. In my opinion, in the environment of this school I am encouraged to reward students for special services they perform						
18. In my opinion, in the environment of this school I am encouraged to seek the consent of others before I make changes in my work						
19. In my opinion, in the environment of this school I am encouraged to						

	No opinion/ Irrelevant 0	**Strongly disagree 1**	**Disagree 2**	**Neutral 3**	**Agree 4**	**Strongly agree 5**
help solve school problems as soon as they arise						
20. In my opinion, in the environment of this school I am encouraged to exchange information regarding problem solving school						
21. In my opinion, in this school environment I am encouraged to improve school programs						
22. In my opinion, in the environment of this school I receive a special reward for effective performance						
23. In my opinion, in the environment of this school I can conclude that the management is aggressive towards anyone who violates the regulations						
24. In my opinion, in the environment of this school I am encouraged to trust the judgments of others and not decide for myself						
25. In my opinion, in the environment of this school I am encouraged to take personal responsibility for the decisions I make in relation to issues concerning the school						
26. In my opinion, in the environment of this school I am encouraged to contribute to the preservation of a positive school climate						
27. In my opinion, in the environment of this school I can conclude that the management is fair and consistent towards those who violate the regulations						
28. In my opinion, in the environment of this school I am encouraged to ask myself if I have contributed to the problems of the school						
29. In my opinion, in the environment of this school I am encouraged to consider suggestions regarding my work as steps for improvement and not as personal criticism						
30. In my opinion, in the environment of this school I am encouraged to express my views in solving difficult school problems						

The questionnaire has 7 categories. The statements are arranged according to their topics, and the number indicates their position in the questionnaire.

1. The openness of the school climate

5. In my opinion, in the environment of this school I am encouraged to express my views on school issues.

14. In my opinion, in the environment of this school I am encouraged to take responsibility for improving the school.

19. In my opinion, in the environment of this school I am encouraged to help solve school problems as soon as they arise.

20. In my opinion, in the environment of this school I am encouraged to exchange information regarding school problem solving.

21. In my opinion, in this school environment I am encouraged to improve school programs.

26. In my opinion, in the environment of this school I am encouraged to contribute to the preservation of a positive school climate

29. In my opinion, in the environment of this school I am encouraged to consider suggestions regarding my work as steps for improvement and not as personal criticism.

30. In my opinion, in the environment of this school I am encouraged to express my views in solving difficult school problems.

2. Effort to succeed at work

7. In my opinion, in the environment of this school I am encouraged to collect data and process them for my work.

12. In my opinion, in the environment of this school I am encouraged to reward students for effective performance.

16. In my opinion, in the environment of this school I am encouraged to work “beyond what is required in the job definition".

17. In my opinion, in the environment of this school I am encouraged to reward students for special services they perform.

25. In my opinion, in the environment of this school I am encouraged to take personal responsibility for decisions I make in relation to issues concerning the school.

3. The structure of the school environment

1. In my opinion, in the environment of this school I am encouraged to use consistent ways of treating students who regularly break the rules.

3. In my opinion in the environment of this school I am encouraged to examine the performance of my work.

11. In my opinion, in the environment of this school I am encouraged to consider the school regulations when I make decisions.

15. In my opinion, in the environment of this school I am encouraged to take fair, determined and consistent steps when school regulations are violated.

23. In my opinion, in the environment of this school I can conclude that the management is aggressive towards anyone who violates the regulations.

27. In my opinion, in the environment of this school I can conclude that the management is fair and consistent towards those who violate the regulations.

4. Providing encouragement for personal responsibility

6. In my opinion, in the environment of this school I am encouraged to trust my personal judgments when I make routine day-to-day decisions.

9. In my opinion, in the environment of this school I am encouraged to trust my personal feelings in decision making.

13. In my opinion, in the environment of this school I am encouraged to make personal decisions in response to problems related to my professional roles.

5. Self-feedback

2. In my opinion, in the environment of this school I am encouraged to consider whether my role is one of the causes of school problems.

8. In my opinion, in the environment of this school I am encouraged to see in my actions/opinions possible causes of problems in the school.

28. In my opinion, in the environment of this school I am encouraged to ask myself whether I have contributed to the problems of the school.

6. Recognition of success

4. In my opinion, in the environment of this school I receive a special reward when my work is done in an extraordinary way.

22. In my opinion, in the environment of this school I receive a special reward for effective performance.

7. Consistency of the structure

10. In my opinion, in the environment of this school I am encouraged to check with others before I deviate from the existing school guidelines.

18. In my opinion, in the environment of this school I am encouraged to seek the consent of others before I make changes in my work.

24. In my opinion, in the environment of this school I am encouraged to trust the judgments of others and not decide for myself.

C. Big Five questionnaire: self-description

Here is a list of sentences or descriptions that characterize different people and these may or may not be true about you. For example, do you that you are a person who likes to spend time in the company of others?

Write next to each description the number that indicates the degree of your consent or disagreement with the description.

5 = Strongly agree, 4 = Agree, 3 = Neutral (neither agree nor disagree), 2 = disagree, 1 = strongly disagree

I see myself as ...

1. ____ talkative
2. ____ tends to criticize and find flaws in others
3. ____ An employee who performs his / her job well
4. ____ A depressed and irritable person
5. ____ An original person who tends to come up with new ideas.
6. ____ Restrained and reserved
7. ____ Right to help and unselfish with others
8. ____ can sometimes be careless
9. ____ A calm person who copes well with pressure
10. ____ Curious about many things
11. ____ Very energetic
12. ____ A person who tends to provoke quarrels with others
13. ____ A reliable employee who can be trusted
14. ____ Tense at times
15. ____ A smart, witty and an in-depth person
16. ____ Enthusiastic
17. ____ Has a forgiving temperament
18. ____ tends to be disorganized
19. ____ A person who worries a lot

20. ____ Has an active imagination
21. ____ tends to be quiet
22. ____ A person who usually gives trust
23. ___ tends to be lazy
24. ___ Emotionally stable, not easily raffled
25. ___ With the character of an inventor
26. ___ Has a decisive assertive personality
27. ___ can be cold, condescending and distant
28. ___ Stick to the target until it is fully completed
29. ___ Prone to mood swings
30. ___ Knows how to evaluate aesthetic and artistic experiences
31. ___ sometimes closed and deadlock
32. ___ A considerate and pleasant person towards almost everyone
33. ___ does things efficiently
34. ___ Remains calm in stressful situations
35. ___ prefers routine work
36. ___ A sociable and open person
37. ___ Sometimes rude to others
38. ___ A person who plans and adheres to plans
39. ___ gets upset easily
40. ___ Often enjoys thinking and having fun with abstract ideas
41. ___ shows little interest in art
42. ___ Likes to collaborate with others
43. ___ A person whose mind is easily distracted
44. ___ Has a deep and complex approach to art, music and literature

Please check: Did you write a number next to each description sentence?

D. Sex education questionnaire

Here are some problems that adolescents face. For each problem, circle the degree of its severity according to the following scale:

1 = not a problem at all, 2 = a small problem, 3 = an average problem, 4 = a big problem, 5 = a very big problem.

The problem	1 = not a problem at all	2 = a small problem	3 = an average problem	4 = a big problem	5 = a very big problem
A. Unwanted pregnancy	1	2	3	4	5
B. Infection with sexually transmitted diseases	1	2	3	4	5
C. Low academic achievement	1	2	3	4	5
D. Infection with AIDS	1	2	3	4	5
E. Violence	1	2	3	4	5
F. Alcohol and drug use	1	2	3	4	5
G. Moving away from religion	1	2	3	4	5

The problem	1 = not a problem at all	2 = a small problem	3 = an average problem	4 = a big problem	5 = a very big problem
H. The effects of communication and the Internet	1	2	3	4	5

2. Rank, by a circle, how much the sexual education that the adolescents receive in the school affects each of the topics we discussed in the previous question, according to the following scale:

1 = does not affect at all, 2 = does not affect, 3 = affects to an average degree, 4 = affects, 5 = greatly affects.

The problem	1 = does not affect at all	2 = does not affect	3 = affects to an average degree	4 = affects	5 = greatly affects
A. Unwanted pregnancy	1	2	3	4	5
B. Infection with sexually transmitted diseases	1	2	3	4	5
C. Low academic achievement	1	2	3	4	5
D. Infection with AIDS	1	2	3	4	5
E. Violence	1	2	3	4	5
F. Alcohol and drug use	1	2	3	4	5
G. Moving away from religion	1	2	3	4	5
H. The effects of communication and the Internet	1	2	3	4	5

Here are some sentences. For each sentence, rate the degree of your agreement with him, by circling the degree of consent and according to the following scale:

1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree.

The problem	1 = strongly disagree	2 = disagree	3 = neutral	4 = agree	5 = strongly agree
1. Having sex between adults before marriage is an immoral thing	1	2	3	4	5
2. Having sex between adults before marriage is a sin	1	2	3	4	5
3. Having sex between teenagers before marriage is an immoral thing	1	2	3	4	5
4. Having sex between teenagers before marriage is a sin	1	2	3	4	5
5. Sex education should be part of a program of the school curriculum	1	2	3	4	5
6. Adolescents need boundaries about sex—You need to teach them what is acceptable and what is not acceptable as the subject of sex education	1	2	3	4	5

The problem	1 = strongly disagree	2 = disagree	3 = neutral	4 = agree	5 = strongly agree
7. Adolescents need to make their own decisions—They should only be provided with information and guidance as the subject sex education	1	2	3	4	5
8. The Ministry of Education should fund sex education classes in which to encourage complete abstinence from having sex before marriage	1	2	3	4	5
9. The Ministry of Education must fund sex education classes In which they will provide information on contraception	1	2	3	4	5
10. The issue of sex education in school should be mandatory	1	2	3	4	5
11. The subject of homosexuality must be taught as part of sex education classes	1	2	3	4	5
12. Providing information to adolescents on how to obtain and use contraception encourages them to have sex at an early age	1	2	3	4	5
13. Providing information to adolescents on how to obtain and use contraception encourages them to have safe sex in the future	1	2	3	4	5
14. The sex education I received from my parents was good	1	2	3	4	5

Circle the choice that indicates to what age adolescents should wait for sex, according to the following scale: 1 = up to age 16, 2 = up to age 18, 3 = up to age 21, 4 = until marriage, 5 = depending on the boy's/girl's desire.

The problem	1 = up to age 16	2 = up to age 18	3 = up to age 21	4 = until marriage	5 = depending on the boy's/girl's desire
17. Until what age should the boys wait to have sex	1	2	3	4	5
18. Until what age should the girls wait to have sex	1	2	3	4	5

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Chapter 6

Sexual Health Education for Youth with Disabilities: An Unmet Need

Shanon S. Taylor and Tammy V. Abernathy

Abstract

Individuals with disabilities experience higher rates of mental, emotional, physical, and sexual abuse than those without disabilities. Children with disabilities are 3.4 times more likely to experience sexual abuse than their peers without disabilities. Although a variety of resources have been created to help improve the sexual health of people with disabilities, one area that is seriously lacking is access to sexual health information and education. Previous work has identified several barriers to providing sexual health education to adolescents and youth with disabilities, including lack of teacher preparation, lack of teacher knowledge that leads to fear, concern, and anxiety, parental anxiety and fear, the lack of valid and reliable sexual health education materials for students with disabilities, and the sexuality of students with disabilities viewed as deviant. This chapter will review those issues and discuss methods to improve sexual health education for youth with disabilities.

Keywords: sexual health education, disabilities, adolescents, teacher preparation, parents

1. Introduction

Sexual health is part of the human experience, yet it is often ignored, especially regarding students with disabilities [1–3]. Sexual health education for people with disabilities is important to help and ensure the capacity of each individual to make informed and educated choices regarding personal safety, developing and maintaining healthy relationships, and understanding how to maintain sexual health and hygiene. The application of self-determination skills plays an integral role in the ability of students with disabilities to attain sexual health [4–8].

Educators are fearful and anxious when they attempt to educate students with disabilities (SWD) about their sexual health [3, 5, 6]. There are numerous and valid reasons for this fear and anxiety. General and special educators report not feeling qualified to teach sexual health education, fear of repercussions from administration, questions over obtaining parental consent and liability, a lack of professional knowledge, concern that they will do more harm than good, and a lack of awareness on how to help a student develop a positive sexual identity [9–13]. This discomfort originates in cultural taboos, rules, and restrictions embedded in school and state policy, and an overall lack of preparation. **Figure 1** outlines critical facts regarding the sexual health of individuals with disabilities (IWD).

- Students with disabilities have a higher risk of becoming victims of sexual violence [1-2, 14].
- Children with disabilities are 3.4 times more likely to be sexually abused than their non-disabled peers [14].
- The lack of knowledge regarding sexual health places students with disabilities at risk for sexual abuse and exploitation, unwanted pregnancies, and sexually transmitted diseases [6, 15-16].
- SWD experience an increased level of vulnerability to abuse, partially due to the absence of comprehensive sex education geared toward people with disabilities [2].
- Sexual health education is taught to students with disabilities reactively instead of preventively [17].
- 11.5% of adults with a disability were victims of sexual assault compared to 3.9% of adults without disabilities [18].
- There is an overarching disparity that persists in access to sexual health education in the United States between youth and adults, demonstrated by the fact that approximately 50% of sexually transmitted infections (STIs) occur among people ages 15-24 [3].

Figure 1.
Facts regarding sexual health of individuals with disabilities (IWD) [1–3, 6, 14–18].

2. Barriers to sexual health education for SWD

Over the last decade, there has been growing acknowledgment of the need for sexual health education for SWD, especially in the United States [4, 7, 8, 15, 19]. However, researchers have identified several existing barriers that have made providing this education difficult [10–13, 16, 19]. First and foremost would be the social and political controversy that exists in the United States over comprehensive sexual health education (CSE) for all students, much less SWD. Funding for school-based sexual health education programs is only provided for programs that are abstinence-based, despite research demonstrating that CSE programs that cover safer sex methods to prevent sexually transmitted infections, issues of consent, and methods of preventing pregnancy are more effective in reducing rates of adolescent sexual activity, pregnancy, and sexually transmitted infections [3, 19–22].

Additional barriers exist specifically in providing sexual health education to SWD. The primary barriers that researchers have identified include—the sexuality of SWD viewed as deviant, the lack of valid and reliable sexual health education materials for students with disabilities, parental anxiety and fear, lack of teacher preparation, and lack of teacher knowledge that leads to fear, concern, and anxiety [19].

2.1 Views of sexuality of IWD as deviant

A key barrier to providing sexual health education to SWD is the view that IWD is asexual or that sexuality for IWD is abnormal or deviant [8, 23]. IWD finds that they are often portrayed as having libidos that are uncontrollable, particularly those with intellectual disabilities [24, 25]. When sexual health education is provided to IWD, it is primarily focused on preventing abuse or pregnancy, and generally does not discuss

relationships or entertain the idea that IWD might enter into sexual relationships for pleasure [26–28]. Finally, when sexual health education is provided to IWD, it is typically only presented as heterosexual sexual health information. IWD can present as LGBTQ+, just as nondisabled individuals can, and they are entitled to sexual health education on those issues. Caregivers have reported homosexual behaviors as experimentation [29], and individuals with intellectual disabilities reported confusion about what it means to be gay and having questions about LGBTQ+ individuals, indicating a need for clearer education [30].

2.2 Lack of valid and reliable sexual health education materials for SWD

Materials to provide sexual health education to SWD generally lack reliability and validity, and when used, they are not implemented with fidelity [6, 31]. Materials that are promoted to provide sexual health education for SWD sometimes are more focused on the students' disabilities than actually providing the needed information regarding sexual health [32]. Other researchers have attempted making adaptations and modifications to existing sexual health curricula using methods, such as Universal Design for Learning principles [33]; however, since most prepared curricula rely heavily on written materials, adapting these for SWD who have limited literacy or are nonverbal will be extremely difficult, and again, will lack validity and reliability.

2.3 Parental anxiety and fear

A key component in providing sexual health education to SWD is parental consent and support. Many parents of SWD either believe their children do not require sexual health education because they view their child as an asexual being or they simply have fears and anxiety about their child engaging in sexual activity [9–11, 34–38]. In discussing their own fears about their child engaging in sexual activity and how to properly educate their child on sexual health matters, parents will often voice views that contradict other views. In some cases, parents state that they do not know enough to be able to properly provide sexual health education to their child with a disability [39], while in other studies, they clearly indicate a preference for being the primary providers of sexual health information to their child [37]. In cases where parents do provide information, IWD often reports that the information is provided in late adolescence or adulthood and is focused on avoiding pregnancy, sexually transmitted infection, or abuse, and that they need more information on how to establish and maintain healthy sexual relationships with others [38]. Parents need to be provided information on how to teach their children with disabilities about sexual health and what the proper information is to teach and when it should be taught [40].

2.4 Lack of teacher preparation and teacher knowledge

Teachers receive a great deal of training to teach content in a number of areas, but sexual health is typically not one of them. When asked about their comfort levels to provide sexual health education in general, teachers report feeling unprepared and having little to no formal training to do so [6, 8, 41, 42]. This becomes more acute when teachers are asked to provide sexual health education to students with disabilities. Even special educators, trained to provide education to SWD, report feeling unprepared to provide sexual health education to those students while acknowledging the necessity of the material [43].

This lack of preparation leads to low rates of teacher knowledge about the necessary components of comprehensive sexual health education and how to teach it to SWD, as well as anxiety and fear about teaching the content to SWD [44]. Studies have found teachers are afraid to teach sexual health education in the general education setting, fearing parental responses and lack of support from the administration [41, 45]. These fears intensified when examining teaching sexual health education to SWD [11]. Instructors have reported feeling that family members do not want sexual health information provided to their child with a disability until the child acts out in some sexual manner or shows interest in a relationship, then the professionals feel they are responding in only a reactionary way, not educating [46].

3. Issues in sexual health education for IWD worldwide

These barriers outlined in the sections above are not unique to the United States or the European Union. While some parts of the world may have introduced comprehensive sexual health education earlier than others, the concept is now worldwide. Additionally, recognition of the need to educate IWD about sexual health is also widespread and is being researched in many countries outside of the United States and Europe. Typically, researchers find some of the same barriers in African and Asian countries that have been demonstrated previously, such as the contradiction between parents' desire to teach children sexual health education themselves and their ability to do so [36, 37]. Researchers in countries as widespread as Canada, Ghana, and China report that sexual health education for IWD is limited in those countries by the typical belief that IWD is asexual and do not need information regarding sexual practices [47–49]. Additionally, cultural and religious beliefs in many countries make comprehensive sexual health education difficult, as it would not be accepted to discuss sexual intercourse outside of marriage, birth control, or topics related to LBTQ+ relationships, and in some cultures even discussing sex at all is unusual [36, 47, 48]. However, it is encouraging that researchers are examining the need for sexual health education for IWD in countries worldwide and how parents, caregivers, and professionals are addressing the need within their own cultural and religious landscapes.

4. The need for sexual health education

Sexual health education includes the teaching of issues relating to human sexuality including human sexual anatomy, sexual reproduction, sexual intercourse, or other sexual activity, reproductive health, emotional relations, reproductive rights and responsibilities, abstinence, and birth control [3, 50]. Common avenues for sexual health education are parents or caregivers, formal school programs, and public health campaigns.

Educating IWD about sexual health issues is critical for their own personal health, safety, and because as with any individual, they are entitled to self-agency to make decisions about their own bodies. When working with IWD, we call this concept self-determination. Self-determination is a life goal for persons with disabilities. It is a set of attitudes and skills that allow a person to care for themselves and carve out goals to achieve as much independence as possible. Self-determination is essentially the ability of a person to be responsible for their life. The components of self-determination include: self-awareness and self-awareness; goal setting and attainment

skills; independence, risk-taking, and safety skills; self-observation, evaluation, and reinforcement; self-instruction, self-advocacy and leadership skills; internal locus of control; and positive attributions of efficacy [51].

The teaching of sexual health to SWD is not typically included in the curriculum of self-determination. However, learning about sexuality embodies the very core of self-determination. While many of the self-determination components have been incorporated into the curriculum for SWD since the 1990s, sexual health has not been directly included [8, 52]. It is easy to deny SWD opportunity and access to sexual health education if it is assumed that students will generalize their self-determination strategies to include sexual health. Educators understand that the generalization of skills and strategies must often be explicitly taught to students with disabilities [53]. Educators need to connect sexual health with self-determination for SWD.

5. Potential solutions to improve sexual health education for IWD

While early research was focused on spotlighting the need for sexual health education for IWD, more recent areas of research have focused on how this education can be effectively delivered. This area of research is much more recent and still relatively recent. There appear to be two primary methods of delivering this education to IWD: preparing parents/caregivers of IWD to provide sexual health education and preparing educators to provide sexual health education. These do not have to be separate tracks of preparation. Even if educators will be providing sexual health education, it is important to also prepare parents/caregivers, because they need to have a perception and understanding of their child with a disability as an individual who is a sexual being with needs and feelings [8].

5.1 Preparing parents

It is recognized that the most effective means of proving sexual health education to SWD involve partnerships between parents/caregivers and education professionals [40, 48, 49]. This will be especially true in cultures in which parents prefer to be the main provider of sexual health information to their children, but perhaps are unsure of what information to provide or when [37]. Additionally, collaborating with parents/caregivers on functional life skills that students will need as they transition into adult life is already a recognized evidence-based practice [51, 52], so including sexual health education along with the discussion on job skills and independent living may make it a more comfortable conversation for parents to have with educators.

Several studies have piloted workshops or education programs educators can use to prepare parents/caregivers to provide sexual health education to their children with disabilities [34, 40, 54–56]. These studies are not limited to the United States and Europe, but worldwide, and all have demonstrated that when parents participate in preparation programs, they gain a greater appreciation of the need to provide sexual health education to their child and gain knowledge on how to provide that education themselves. The modalities of these programs vary (online, booklets, in-person groups), but one study conducted in Iran demonstrated that training conducted with mothers in group settings was more effective than via other modalities [56]. Another set of researchers is currently piloting a full curriculum that can be used to

lead in-person trainings with parents to prepare them to comfortably provide sexual health education to their children with disabilities [57]. This research will further support collaboration between parents and professionals.

5.2 Preparing teachers

A significant barrier to teaching sexual health to students with disabilities is the teacher's discomfort with the topic and a general lack of pre-service and/or in-service preparation [6, 9, 10]. The only way to move through this barrier is to have the teacher become comfortable with the uncomfortable. Below, we will provide an example from our own experience as teacher educators that address this issue.

To start this process, sexual health for students with disabilities was added to special education teacher education coursework. One course within the teacher education program was identified by the program coordinator as appropriate for this project. The course included content on self-determination, transition, and methods for teaching students with disabilities in secondary schools. The course was positioned in the program during the last semester of coursework prior to internship (student teaching) with 25–30 students typically enrolled. Students in the course completed their teacher education program as a soft cohort, meaning most of the students took their courses together. All students took at least one course with the cohort prior to this course. The fact that students were well known to each other was an important consideration in selecting the course. This allowed students to feel safe and comfortable discussing sexuality and expressing their concerns. It is important to note that in this configuration the professor was often the only person in the room that was unknown to the students.

Sexual health is a topic that is presented in the course syllabus, but it is always placed at the end of the semester. This allows time for the professor to create a safe environment and to build rapport with the students. When students are asked to look through the course topics and talk about what excites them and what concerns them, sexual health is consistently mentioned as a concern. It is never a topic the student teachers are excited to learn about. There is anxiety regarding the topic. This informal data point is important in terms of building community and preparing for the topic.

To prepare pre-service teachers for instruction in sexual health, the course included short mini-lectures reviewing adolescent development. Additionally, pre-service teachers completed a series of community and school observations focusing on body language, touching, sexual innuendo, followed by a review of media and music that adolescents find engaging.

The course focused on strategies teachers could use to develop self-determination and student engagement in the individualized education program (IEP) and transition process. This section of the course was essential, as it developed specific skills, and perhaps equally important was the development of a teacher's disposition to promote self-determination development in all students with disabilities [58, 59].

Observations combined with instruction and skill development in self-determination served as precursors to instruction in sexual health. By this time in the course, pre-service teachers and the professor had formed a strong and comfortable relationship. Further, pre-service teachers had enough practicum and substitute teaching hours to have encountered sexual health situations that they had felt unprepared to address. This confluence of professional experiences reduced the pre-service teachers' anxiety about sexual health as a course topic.

To provide the sexual health content, the professor of the course collaborated with a health educator, who had training in sexual health and special education. The health educator worked within the College of Education and was familiar with the teacher education program. This model demonstrated to the pre-service teachers that collaboration and partnerships can be an effective approach when teaching topics in which they lacked expertise. Collaboration with the health educator bridged the knowledge between special education and sexual health education. Instruction in sexual health was provided by the health educator during a guest lecture and was divided into two sections. Initially, pre-service teachers were introduced to the topic through a more traditional lecture presentation merging the topic of sexuality in relation to self-determination for students with disabilities. After the lecture section, the pre-service teachers participated in a structured activity that included six real-life dilemmas practicing special education teachers had encountered. This activity was designed to develop teacher confidence in the topic.

A class activity entitled the "Real Life Dilemma" was introduced. The class was divided into six groups with each group receiving one unique dilemma. Each dilemma was an actual situation that had occurred locally or nationally within the past 6 years in the United States. The class was given 30 min to review a dilemma and make a decision (i.e., what action will you take?). Each group shared with the class their dilemma, the key issues discussed, and their decision. After the conclusion of each such discussion, the health educator shared the actual outcome with the class. The actual outcome was then discussed and evaluated in a short debriefing of the dilemmas. The discussions were led by both the health educator and the course professor. The following questions were posed during the debriefing of the activity:

- Why is this issue important?
- How does this issue and the outcome influence you as a teacher?
- What is your position on the issue? Why?
- Does your response and the actual outcome promote self-determination?

Pre-service teachers responded to the dilemmas within a positive self-determination framework in 8 out of 12 responses (67% of the responses were positive). In four instances, pre-service teachers' responded with a solution that did not promote self-determination for students with disabilities. The actual outcomes of the six dilemmas were situations involving practicing special education teachers. Those teachers took action within a positive self-determination framework in 4 out of the 6 dilemmas (67% of the responses were positive). For both groups the responses that did not promote self-determination were ambivalent, or safe responses, perhaps reflecting the anxiety teachers feel when approaching sexual health topics.

Pre-service teacher responses favored solutions promoting self-advocacy, self-awareness, and self-efficacy. These are considered more internally focused components of self-determination. These components are not directly taught, but rather they must be facilitated over a long period of time and in a variety of situations. Teachers whose responses were the actual outcomes in this project used decision-making and goal setting as the favored self-determination components. Interestingly, pre-service teachers in the course focused their responses more on the student-centered components of self-determination, whereas, practicing teachers focused more on student thinking and

planning. These components could be directly taught. Most importantly, self-determination components were strongly represented throughout the dilemmas in terms of how teachers and students should solve dilemmas related to sexual health for students with disabilities.

6. Conclusions

Great advances have been made in the last two decades in teaching sexual health education to individuals with disabilities and this means we are making advances toward recognizing IWD as self-determined individuals with autonomy and rights over their bodies. But while we have done much to illuminate the need for sexual health education for IWD and identify existing barriers, our next steps must be in researching the most effective ways to provide it. Current research indicates that we should take a two-pronged approach: prepare both parents and educators to work together and be able to provide knowledgeable, appropriate sexual health education to students with disabilities.

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Conflict of interest

The authors declare no conflict of interest.

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Section 5

Sexuality for People with Disabilities

Chapter 7

Sexuality and Disability

Danita H. Stapleton, Sekeria V. Bossie, Angela L. Hall and Lovett O. Lowery

Abstract

Sexuality and disability is an important topic in our global society. Dismantling myths about sexuality and disability is considered a final frontier for people with disabilities. Dismantling myths about sexuality and disability is vital to the overall health and well-being of people with disabilities. A major aspect of the dismantling process is to acknowledge that sexuality is a significant quality of life determinant for all human beings. This chapter provides information that will promote a healthier and more accurate view of Sexuality and Disability. Dismantling this last frontier involves providing the readership with relevant historical information; information about psychosocial factors and attitudes that influence sexuality; and information about ethical practice guidelines. Information pertaining to sexuality training, specific provider competencies and how select disabilities and chronic illness impact sexuality is also covered in the chapter.

Keywords: sexuality and disability, sexual conditions, disability rights, sex education, sex and disability

1. Introduction

Sexuality and disability is a comparatively new issue of concern with pertinent research on the topic originating in the 1970s [1]. It was during this era that we witnessed increased focus on principles of normalization as a basis for service delivery for people with disabilities [2]. It was also during the 70s that the *Twelfth World Congress of Rehabilitation International* convened to address the rights of people with disabilities with regard to sexual behavior, e.g., the right to be informed about sexual matters, the right to sexual expression, the right to marry, and the right to become parents [3]. Despite these pioneer efforts, people with disabilities continued to encounter stigmas and negative attitudes. Fear, ignorance, and misconstructions have resulted in people with disabilities being viewed as asexual beings. Amplified educational and advocacy endeavors are needed to bring greater awareness to the fact that people with disabilities have an indisputable right to meaningful sexual relationships, sexual satisfaction, and sexual expression. Sexuality is uniquely manifested through language, emotions, thoughts, and behaviors. It is a byproduct of personal values, beliefs, and desires, as well as cultural and gender socialization. Stanojević et al. [4] posited that sexual socialization plays a critical role in healthy sexual development. They discussed the dynamical relationship between sexual behavior and sexual

socialization and how the two influence sexual health. Social disconnections or the lack of appropriate sexual socialization can lead to maladaptive sexual behaviors and social isolation.

Best professional practices dictate that healthcare providers refrain from coercing clients to discuss sexuality needs or concerns. However, questions pertaining to this significant aspect of human functioning are basic to holistic assessment and treatment. Clients should feel as if the door to discussing these matters is open throughout the tenure of care or service and that sexuality is a natural topic for discussion. Conscientious providers are aware of their limitations and promptly refer out when a sexual concern extends beyond their scope of practice. According to Nosek [5], "disability is a complex phenomenon, but psychosocial and social factors make all the difference in the outcomes" (p. 121). In the following section we will explore psychosocial factors that should be considered when sexuality and disability present as a rehabilitation concern.

2. Psychosocial and factors

The goal of the conscientious provider is to increase protective psychosocial factors and to decrease or eliminate psychosocial factors that foster risk or harm. These factors can be addressed by a single provider or an interprofessional team [6]. According to Mah and Binik [7], sexuality involves more than physical performance or physical factors. Positive attention to psychosocial factors tend to correlate more with healthy sexuality. **Table 1** depicts psychosocial factors impacting sexuality.

A holistic assessment tool should capture information or invite discussion in all of the areas above. This information can easily be converted into a needs assessment. Agencies adhering to the medical model of disability versus the social-environmental model of disability may not see the value of assessing for protective and risk factors that impact sexual functioning.

Protective factors	Risk factors
Healthy, functional, supportive family-of- origin	Dysfunctional family-of-origin
High level of self-confidence, self-esteem	Low self-confidence, poor self-esteem
Appropriate sex education (e.g., age level, cognitive level, etc.)	No formal sex education
Body image acceptance (rejection of dominant, ableist, heteronormative notions about beauty, sex)	Poor body acceptance (internalization of dominant, ableist, heteronormative notions about beauty, sex)
Positive social network	No (or insufficient) social network
Healthy, positive coping ability	Poor coping ability
Internal locus of control	External locus of control
No history of sexual abuse, exploitation	History of sexual abuse, exploitation
Acceptance or positive adaptation to disability	Low acceptance or poor adaptation to disability
General sense of optimism	General sense of pessimistic
Service agency or provider adheres to a social-environmental model of care	Service agency or provider adheres to a medical model of care

Source: [5, 8, 9].

Table 1.
Psychosocial factors impacting sexuality.

2.1 Social stigmas and attitudinal barriers

Myths about disability and sexuality are pervasive in our society. According to Esmail et al. [8], stigmas and negative attitudes often result in the internalization of concepts that can adversely influence self-esteem and sexual confidence. The researchers underscored how public attitudes and perceptions are driven by education and knowledge. Personal biases and beliefs can also limit providers' ability to engage comfortably with clients while discussing sexuality or sexual health. The ethical expectation is to do no harm; yet harm can occur when providers fail to embrace the notion that sexuality is a critical quality of life determinant. It is important that healthcare professionals be mindful of the roles they play in propagating myths and negative attitudes about sex and disability. Obtaining accurate knowledge and relaying this knowledge is the only way to eradicate broadly held destructive beliefs [10]. According to Haboubi and Lincoln [11], 90% of multi-disciplinary health professionals agreed that sexuality should be part of holistic care (N = 813); yet 86% felt poorly trained and 94% were unlikely to discuss sexual issues with patients. Healthcare providers in a qualitative study (focus group discussion) confirmed that sexuality conversations were lacking in many healthcare settings. Inquiries tend to be superficial; areas of needs are rarely assessed; and there is a lack of follow-up. Typically, during the hospital admission process, patients are asked about sexual function, but investigation and intervention beyond initial inquiries are rare [9]. Currently many healthcare providers continue to report a lack of relevant or formal education as it relates to sexuality, or sexuality and disability. Many feel that sexuality is not a primary core competency. Kazukauskas and Lam's [12] findings supported the premise that increased proficiency leads to greater ease when discussing and addressing issues pertaining to sexuality and disability. The provision of support that becomes possible with a deeper understanding of sexuality and disability is fundamental to the rehabilitation process [10].

2.2 Taboos and myths

Sexuality has longed been a taboo subject because of societal, religious, and cultural norms and expectations. It is the forbiddingness of the topic that has erected barriers to addressing sexuality in healthcare settings. This taboo is associated with a lack of knowledge, inadequacies in training, and low levels of comfortability. Sexuality is a private and sensitive subject and must be approached professionally to avoid any confusion of emotions and feelings between the healthcare professional and client. Therefore, adequate knowledge of and training on how to approach and address this topic is vital to overcoming barriers and ensuring successful interventions.

Common myths are outlined below [3, 10, 13, 14]. Rehabilitation professionals, in particular, have an obligation to do what they can to debunk these myths.

- People with disabilities are asexual, having no sexual desires or interests
- No able-bodied person would find someone with a disability desirable
- Sexual intimacy is not possible for people with disabilities
- People with disabilities are not suitable marriage or sexual partners

- Preventive medical procedures such as pap smears are not necessary for women with disabilities, especially those with spinal cord injuries
- Sex education is not necessary for people with disabilities
- It is easier for people with disabilities to adapt to sexual losses and changes

2.3 Legal and ethical requirements

Large aggregate care institutions serving people with disabilities were closed in most western European and North American countries in the 1970s and 1980s and today, large numbers of people with disabilities are living independently. They hire personal assistants who are their employees, not their overseers. They have been empowered by the disability rights movement to demand access, support, and respect. As part of their increased independence, many are unapologetically exploring their sexuality. They are finding partners, engaging in romantic relationships and refusing to be told that a disability automatically disqualifies them from having an erotic life [15]. There is a delicate balance between the legal and ethical requirements to protect people with disabilities from harm, including sexual exploitation and abuse, while at the same time protecting their rights to express sexuality in a healthy way [16]. Honest, accurate information about sexuality changes lives, especially for individuals with disabilities. It dismantles stereotypes and assumptions, builds self-acceptance and self-esteem, fosters healthy relationships, improves decision-making, and has the potential to save lives. However, because the topic of sexuality and disability is often surrounded by controversy and stigma, it is important for healthcare providers to remain ethical and professional when dealing with such issues.

2.4 When protection from harm infringes upon personal rights

There is a delicate balance between the legal and ethical requirements to protect people with disabilities from harm, while at the same time protecting their rights to sexual expression. Traditionally, parents, professionals, and the law have erred on the side of protection from harm, consequently limiting sexual expression of people with disabilities, e.g., the same laws that were designed to protect people with disabilities from harm prevented them from engaging in normal sexual activities [16]. What appears to be concern for the welfare of people with disabilities therefore could, in reality, be masking an anti-sexual bias. Since the law protects the rights for sexual activity for and between individuals with disabilities, service providers cannot have policies prohibiting it [17]. Instead, agencies should have policies that help people with disabilities learn about and express their sexuality in healthy ways within the confines of the law and ethical principles [16, 18, 19].

Among the many barriers to healthy sexual expression for people with physical and developmental disabilities is lack of privacy [20]. Individuals have the right to privacy and to consensual sexual relations. These rights are restricted, obviously, for children, and also for those individuals who are determined to be incapable of consenting to sexual activities. However, the right to privacy is often restricted in the case of an individual who engages in severe self-injurious behavior and/or property destruction. In these cases, the individual's service or behavior plan frequently requires 'line-of-sight' supervision, which challenges the individual's right to private sexual expression. This is not a simple matter, as it exemplifies the conflict between concern for wellbeing and upholding of the rights of the individual.

2.5 Consent

Capacity to consent can vary over time. This means capacity to consent is a state rather than a trait. Sexuality education can enhance the capacity of people previously deemed incapable of making informed decisions. Thus, repeating an assessment for capacity to consent may yield different findings across time and may indicate that even individuals with intellectual or developmental disabilities who were previously deemed incapable, have developed the capacity to consent to sexual interactions. Additionally, the requirements of consent can vary based on the nature of the sexual interaction. Thus, to best help people with disabilities make informed choices, good quality ongoing sexuality education is necessary [21].

The crucial components of capacity to consent are knowledge, rationality, and voluntariness [22]. Sexual knowledge starts with the ability to label body parts, identify sexual behaviors, and understand where and when it is appropriate to engage in sexual behaviors and where and when it is not appropriate to do so. Sexual knowledge encompasses being able to state the consequences of sexual behavior, specifically pregnancy and sexually transmitted infections, and how to prevent them. Knowledge also means the person can demonstrate how to obtain and use contraception [22]. Voluntariness means the person can decide without coercion, that, and with whom he or she wants to have sex. This also means he or she is able to take necessary self-protective measures against abuse, exploitation, and other unwanted advances. Voluntariness also means that the person has the ability to say, "No," either vocally or non-vocally, and to remove him or herself from a situation and indicate a desire to discontinue an interaction [22–24]. Rationality means the ability to evaluate and weigh the pros and cons of a sexual situation and make a rational decision. When considering someone's ability to be rational, any neurological conditions that can impair decision-making need to be considered. Determining rationality comprises the individual's awareness of person, place and time; his or her ability to accurately report events; and to discriminate between fantasies, lies, and truth. The individual should be able to describe the process for deciding to engage, or not, in a partnered sexual interaction, to demonstrate an understanding of mutual consent, and chose socially appropriate times and places to engage in sexual behaviors. Finally, he or she should be able to perceive and respond to the vocal and non-vocal signals of the feelings of his or her partner, specifically the desire to continue or discontinue the sexual interaction [22].

2.6 Disabilities influence on sexuality

Sexuality is defined as a multidimensional construct in which the individual expresses feelings, thoughts, and cognition, such as the demonstration of intimacy, affection, love, touch, hugging, including sexual contact itself [25]. This asserts that sexuality includes many aspects of a person's life and while it encompasses the concept of intercourse, sexuality exceeds the idea of physical sex. The ability to fully experience sexuality does not have to be hindered by a person's or couple's disability status. Sexuality and being sexually healthy is an important part of life. According to the World Health Organization (WHO), sexual health is defined as "a state of physical, mental and social well-being in relation to sexuality", which "requires a positive and respectful approach to sexuality and sexual relationships, as well as pleasurable and safe sexual experiences, free of coercion, discrimination and violence" [4]. This definition indicates that sexual health is not just about physical intercourse but also about the mental and social connections involved with intimacy. People

with disabilities have the right to experience this connectivity just as people without disabilities. Societal attitudes, beliefs and perceptions guide how individuals with disabilities are regarded. These attitudes, beliefs, and perceptions are also evident in healthcare settings. If an individual without a disability experiences a lack of sexual desire, he or she is diagnosed as having hypoactive or inhibited sexual desire disorder [26]. Similarly, if this person is unable to experience an orgasm, he or she is diagnosed as having an orgasmic disorder. The rendering of a diagnosis makes it possible to qualify for medical treatment and to receive assistance in achieving sexual satisfaction [26]. These disparities in medical perspectives can ultimately impact the quality of life for people with disabilities. Very often these individuals are expected to simply adjust to their disability status with no consideration or discussion about appropriate or possible interventions.

More than 15% of the world's population have disabilities. These disabilities can be categorized as physical and sensory; developmental and intellectual; and psychosocial [27]. Society has long disregarded the sexuality and reproductive concerns, aspirations, and human rights of this sector of our population [27]. People with disabilities are often not educated related to concepts about sexuality, relationships, and intimacy. People with disabilities are often viewed as infantilized and held to be asexual (or in some cases, hypersexual). Furthermore, they are often viewed as incapable of reproduction and unsuitable as sexual or marriage partners or parents [27]. While not all disabilities impact sexuality, many of them disabilities do. The following sections discuss how physical disabilities, cognitive/intellectual disabilities, mental disabilities, and disabilities related to aging impact sexuality and levels of intimacy.

2.7 Physical disabilities

2.7.1 General description

Physical disabilities are disabilities that impact the mobility of a person. Physical disabilities directly affect muscles and limbs. Physical disabilities include but are not limited to the following types of conditions: lupus, cerebral palsy, absent or reduction in limb functions, and muscular dystrophy.

- Lupus
  - Lupus is a chronic autoimmune disease where one's own immune system attacks many different systems within the body.
- Cerebral palsy
  - Cerebral palsy is a group of disorders that affect a person's ability to move and maintain both balance and posture. This disorder is characterized by stiff muscles, uncontrollable movements, and poor balance and coordination [28].
- Absent limbs or reduction in limb functions
  - This group is related to the loss of limbs through amputation or injury in addition to the absence of limbs since birth. Additionally, this group includes individuals who lose functioning or control of their limbs over time, limiting their mobility and their ability to complete tasks

- Muscular dystrophy
    - Muscular dystrophy is a group of muscle diseases that are caused by genetic mutations [29]. Muscular dystrophy affects each person differently. However, in general terms this disorder is characterized by muscle weakness that decreases mobility and the ability to complete everyday tasks [29].

2.7.2 Impact on sexuality

Physical disabilities impact sexuality in a variety of ways. The impact is based on the person, their specific condition, and the severity of their condition.

- Lupus
    - Individuals with lupus are impacted physically and emotionally by their symptoms. Sexual dysfunctions are the result of both the physical and psychological problems [30]. The physical limitations affect individual's ability to be intimate but psychologically their motivation and desire to engage in intimacy is impacted. Those diagnosed with lupus often experience pain during sexual activity [30]. Pain can be a significant barrier to a healthy sexual experience. With lupus, this pain can occur even with gentle movement. Pain during intercourse, vaginal dryness, and the development of ulcers in the mouth and genitals areas are manifestations of with lupus [30]. Additional side effects of lupus that such as fatigue and weight gain may also impact sexuality.

- Cerebral palsy
    - Individuals with cerebral palsy frequently are not able to reach an orgasm and report infrequent experiences with intimacy. Individuals with cerebral palsy are limited by personal and functional characteristics that are specific to their type of cerebral palsy. Additionally, they may struggle with issues related to energy, fatigue, body image concerns, and lack of sexual confidence.

- Absent limbs or reduction in limb functions
    - While sexual functioning is rarely structurally diminished by absent limbs or reduction in limb functions; many individuals with these disabilities experience sexual challenges [31]. They may struggle with internalized views of their sexual self or with the external views of others. Reductions in sexual interest, frequency, arousal, and difficulties pertaining to orgasm and sexual drive have specifically been reported in this group of disabilities [31].

- Muscular dystrophy
    - Individuals with muscular dystrophy report difficulties with kissing and oral sex [32]. Both of these activities require significant muscle movement and coordination. Individuals with muscular dystrophy also report difficulties with bodily positions during sexual activities and having a negative body image in general [32]. Individuals with muscular dystrophy also report difficulty communicating with their partners about their functional limitations [32]. Some of their

limitations are related to hugging and being able to caress [32]. Other manifestations may include pain during intimacy, fatigue, and erectile dysfunction [32].

2.8 Cognitive/developmental/intellectual disabilities

Cognitive/developmental/intellectual disabilities are disabilities that impact the thinking process, adaptive development, and ability to socially connect with others. These conditions have a variety of social characteristics: impulsivity, limited attention span, difficulty understanding social ques, and perceptual limitations related to other behaviors. This group of disabilities are characterized by diagnoses such as attention deficit hyperactivity disorder (ADHD), autism spectrum disorder, and down syndrome.

2.8.1 General description

- Attention deficit hyperactivity disorder
  - ADHD is a neurodevelopmental disorder, which many recognize as a childhood disorder [33]. However, a review of the literature as well as longitudinal studies of individuals with ADHD reveals that symptoms of ADHD can persist into adulthood [34]. According to the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM 5), ADHD is characterized by impulsivity, hyperactivity and inattention [35]. Overall, it is a developmental disorder that impacts social interaction and behavior patterns.
- Autism spectrum disorder
  - According to the DSM 5, autism spectrum disorder is a neurodevelopmental disorder characterized by (1) persistent deficits in social communication and social interaction across multiple contexts and (2) restricted, repetitive patterns of behavior, interests, or activities [35]. Autism spectrum disorder may impact individuals' ability to interact socially and make connections with others.
- Intellectual disability
  - This is a disorder where an individual may present with limited understanding along a spectrum. These individuals may present with cognitive impairments (mild, moderate, severe or profound).
- Down syndrome
  - Down syndrome is a genetic disorder that results in an extra chromosome 21, either partially or fully. Down syndrome symptoms exist on a spectrum from mild to severe. Individuals with Down syndrome often present with both physical and intellectual challenges.

2.8.2 Impact on sexuality/intimacy

- Autism spectrum disorder and ADHD
  - Social connection, a large component of sexual health, is often a major obstacle for individuals diagnosed with autism spectrum disorder [4]. Individuals with

autism spectrum disorder often have social deficits that influence their ability to connect with others. Sexuality is associated with an emotional and social skill-set that may directly influence appropriate sexual behaviors and how human beings connect with others [4]. Similarly, to autism spectrum disorder, ADHD presents social obstacles. These social obstacles impact intimacy, experiences with connectivity, and sexual decisions.

- Intellectual disability and down syndrome
  - Studies indicate that people with intellectual disabilities and Down syndrome face various personal and socioenvironmental barriers in their sexual lives [36]. Many of these are related to their inability to understand the dynamics of intimacy and sexual situations. Some of the barriers that negatively impact individuals with intellectual disabilities and Down syndrome include limited sexual knowledge, poor education, negative attitudes related to sex, lack of access to healthcare, lack of sexual experiences, and social isolation [36]. Each of these factors impede the development of healthy sexual behavior practices. Overall, the lack of knowledge about sexuality coupled with limited sexual experiences, language difficulties, communication problems, fear, embarrassment, low self-esteem, and poor negotiating skills can increase exposure to unsafe situations for both men and women with intellectual difficulties and/or Down syndrome [36].

2.9 Mental disabilities (mental illnesses)

There are many mental health disorders that impact sexual functioning. Some categories identified in the DSM 5 are mood disorders, anxiety disorder, psychotic disorders, and eating disorders. The prevalence of sexual dysfunctions is higher in persons with mental disorders, particularly those treated with psychotropic medications [37].

2.9.1 General description

- Mood disorders
  - This is a group of mental health conditions that is characterized by the disturbance of one's mood contributing to feelings of dysthymia, dysphoria, euthymia and/or euphoria. Very often in this group, a person's mood is unstable and requires medical treatment.
- Anxiety disorder
  - This is a group of mental health conditions that are known to cause excessive and consistent fear and worry. Some individuals may experience panic attacks or have severe forms of anxiety that not only impact their perceptions and experiences socially and intimately, but also affect their physical mobility.
- Psychotic disorders
  - This is a group of mental health conditions where perceptions and experiences are impacted by external stimuli and thoughts that may not be based on reality.

Psychotic disorders are regularly treated with antipsychotic medications whose common mechanisms impact sexual experiences as well [37]. Symptoms associated with psychotic disorders may also impact the ability to meaningfully connect with others, socially and intimately.

- Eating disorders
  - This is a group of mental health conditions relate to eating habits. Eating disorders are manifested by eating and purging, binge eating, and extreme caloric restriction. Very often individuals are ashamed of their behaviors and engage in these activities in secret. Eating Disorders can influence individuals' ability to connect socially and intimately with others.

2.9.2 Impact on sexuality/intimacy

The rate of sexual disorders in people experiencing mental disabilities is significantly high. The use of psychotropic medications and subsequent side effects often exacerbate sexual dysfunction [37].

- Mood disorders
  - Major depression is a common mood disorder. Decreased libido commonly accompanies an episode of major depression [37]. Depressed persons may also experience diminished ability to maintain sexual arousal or achieve orgasm. In males with severe depression, the rate of erectile dysfunction is as high as 90% [37].
- Anxiety disorder
  - There are several types of anxiety disorders and each has symptoms that impact a person's ability to emotionally connect with others due to stress and worry. Additionally, a loss of libido occurs frequently in people with high levels of anxiety.
- Psychotic disorders
  - Patients suffering from psychotic disorders are prone to experience sexual dysfunction as a part of the nature of the disease [37]. Negative symptoms of the disorder, such as anhedonia, avolition, and blunted affect significantly diminishes the ability to enjoy sexual and intimate activities [37]. In addition, these individuals face difficulties in establishing relationships due to recurrent psychotic episodes, obesity, and low self-esteem [37].
- Eating disorders
  - Clinicians have often reported that anorexia nervosa patients suffer from sexual dysfunction and immaturity, evident by low sexual interest, inhibited sexual behavior, disgust towards sex, and fear of intimacy [37].

2.10 Aging/neurological disabilities

Aging and neurological disabilities are disabilities that impact the brain and spinal cord. These disorders may also be more prominent in individuals who are older.

2.10.1 General description

- Alzheimer's disease and dementia
    - Dementia is a disorder that encompasses conditions that affect memory, focus, communication, judgement, and perceptions. They vary in degree of severity and influence the way individuals are able to interact with and experience others. Alzheimer's disease is a specific and common type of dementia.
- Parkinson's disease
    - Parkinson's disease is an age-related, chronic, multisystem, progressive disorder with motor symptoms and nonmotor symptoms [38]. Some of the motor symptoms include rigidity, tremors and postural instability [38]. Some of the nonmotor symptoms include anxiety and depression.
- Traumatic brain injuries
    - Traumatic brain injury is harm to the brain due to trauma. This can result from a forceful strike to the head or from something penetrating the head. Both injuries can result in both physical and emotional symptoms.
- Spinal cord injuries
    - Spinal cord injuries are debilitating conditions that result from a sudden, traumatic impact on the spine that fractures or dislocates the vertebrae [39]. The severity of the injury and the location of the injury dictates the level of functional limitation. Spinal cord injuries can result in paraplegia, or tetraplegia [39]. Paraplegia is defined as the impairment of sensory or motor function of the lower extremities while tetraplegia is defined as a partial or total loss of sensory or motor function in all four limbs [39].

2.10.2 Impact on sexuality/intimacy

- Alzheimer's and dementia
    - Individuals diagnosed with dementia or Alzheimer's endure mental health symptoms such as depression and anxiety that impact their motivation and ability to participate intimately with others. Physically they may experience erectile dysfunction and reduced strength and mobility due to impairment of the motor systems.
- Parkinson's
    - Adults with Parkinson's report significant adverse effects on quality of life due to their symptoms [38]. They report concerns with both depression and

anxiety [38]. These symptoms influence how they view themselves and how they believe others view them. They also report issues with urinary disturbances and erectile dysfunction as well as issues with pain, and sensory issues related to the reduced blood flow to and from sexual organs [38].

- Traumatic brain injury
  - Individuals who experience traumatic brain injury report coping with changes in their sexual desires. Some report that they have decreased sexual desires and a loss in sexual interest while others report increased in sexual desires and difficulty controlling sexual desires [40]. Individuals with traumatic brain injuries report decreased sexual arousal even when they are interested in intimacy [40]. Men may experience erection difficulty, while women may present with difficulties with vaginal lubrication. Both men and women with traumatic brain injuries report trouble reaching a climax and in general they report lacking satisfaction after intimacy [40].
- Spinal cord injuries
  - The type of injury to the spinal cord dictates the degree of sexual difficulty [41]. Sexuality concerns vary widely. There are reports of limitations with erections and ejaculatory difficulties in men [41]. In women there are reports of decreased lubrication [41]. In general, the frequency of sexual activity and intercourse appears to decline after a spinal cord injury [41]. Individuals with spasticity in the hips and thighs also experience challenges as they relate to sexual intimacy [41].

This final section of the chapter will identify how occupational therapy (OT), physical therapy (PT), and rehabilitation counseling approach the topic of sexuality with clients. All three disciplines emphasize the importance of (1) acknowledging sexuality and disability, (2) early initiation of discussions by the healthcare professionals, (3) self-awareness of the healthcare professionals' attitudes towards sexuality and disability and as their own sexuality, and (4) counseling education.

2.11 Sexuality and disability: A interprofessional perspective

The topic of sexuality has previously been unrecognized or disregarded by many healthcare professionals when addressing clients' care, holistically [12, 42, 43]. Discussions concerning sex and disability have been particularly arduous. However, over the course of years, the emergence of the identification and acknowledgement that sexuality is important to all human beings has contributed to a positive shift towards acceptance. Consequently, sexuality is slowly becoming a more acceptable topic to discuss and approach in the clinical setting.

Sexuality in healthcare should be approached from an interprofessional perspective. Sexuality is a core aspect of an individual's overall health that "encompasses sex, gender identities and roles, sexual orientation, eroticism, pleasure, intimacy and reproduction" ([44] , p. 5). Disciplines within the healthcare realm address these core sexuality aspects in manners specific to their disciplines. Healthcare professionals from various disciplines acknowledge that individuals with disabilities are sexual beings, and that addressing sexuality in practice is integral in providing holistic care. According to Haesler et al. [45], given the strong connection between sexuality and quality of life it

is important to understand factors that influence its recognition by health professionals. Despite differences in addressing sexuality, some methods amongst providers are comparable. Furthermore, the practitioners' "interactions should be directed toward creating an environment that promotes the client's self-esteem, positive and appropriate sexuality, and adjustment to disability" ([46], p. 214).

2.12 Comfort level and personal bias

Personal bias and comfortability are important elements to consider when creating an environment where sexual issues can be addressed or explored. Healthcare practitioners must be able to express empathy and understanding while maintaining appropriate personal and professional boundaries [9]. Such attributes allow practitioners to establish a therapeutic relationship in which they can build trust and confidence necessary to approach this intimate subject. Practitioners must look inward and conduct a self-assessment of their personal attitudes and beliefs, even before initiating the discussion of sexuality with their clients. Being aware of one's own sexuality and level of comfort is an essential component when conversing about sexuality [12]. Healthcare personnel should not demand that their clients discuss concerns related to sexuality, but rather create opportunities by obtaining permission to discuss sexuality [47].

To counsel effectively, one must first feel comfortable with one's own sexuality and then progress to achieving comfort in discussing sexuality with others" ([48], p. 543). Addressing sexuality and disability requires a multifaceted skill-set; one that necessitates factual knowledge, awareness, and interpersonal skills. Health-care professionals' roles can vary when providing sexuality counseling for people with disabilities [47]. Sexuality training implemented by healthcare practitioners may comprise sex health education and information on related topics and issues such as the physical and psychosocial effects of disability on sexuality, anatomy and development of sexuality, anatomical and systems-related dysfunction, sexual adaptation to functional issues, and appropriate sexual behavior [46–48]. Due to the sensitive nature of the topic of sexuality, healthcare practitioners have been encouraged to utilize the PLISSIT Model when approaching this topic with their clients.

2.13 Occupational therapy and sexuality

2.13.1 Therapeutic use of occupations and self

OT is a profession in healthcare that involves "the therapeutic use of everyday life occupations with persons, groups, or populations (e.g., the client) for the purpose of enhancing or enabling participation" (c, 2020, p. 1). Occupations are identified as an aspect within the domain of practice for OT and are defined as "everyday activities that people do as individuals, in families, and with communities to occupy time and bring meaning and purpose to life" ([49], p. 7), and the therapeutic use of self is defined as the process "in which OT practitioners develop and manage their therapeutic relationship with clients by using professional reasoning, empathy, and a client-centered, collaborative approach to service delivery" ([49], p. 20). Occupations, along with the therapeutic use of self are cornerstones for this profession.

Studies have shown that "sexuality is important to clients and that occupational therapists believe that addressing clients' sexual issues is a legitimate domain of practice that should be included in order to provide holistic treatment" ([43], p. 53). In OT,

occupations are further categorized in eight broad categories within the OT practice domain: activities of daily living, instrumental activities of daily living, health management, rest and sleep, education, work, play, leisure, and social participation. It is from these broad occupations that occupational therapists approach the topic of sexuality with their clients. OT practitioners recognize sexuality as an important aspect of an individual's activities of daily living, health management, and social participation, and acknowledge how sexuality directly impacts an individual's self-esteem and quality of life. In fact, sexual activity, "engaging in the broad possibilities for sexual expression and experiences with self or others (e.g., hugging, kissing, foreplay, masturbation, oral sex, intercourse)" ([49], p. 30), is specifically identified as an ADL in the Occupational Therapy Practice Framework-IV (OTPF-IV). Along with an individual's occupation, OT practitioners also recognize an individual's sexuality as it relates to their roles and routines. Despite the inclusion of sexual activity as an occupation in the OTPF-IV and the acknowledgement of sexuality as a legitimate domain of practice, studies show OT practitioners "do not adequately address sexual activity in their clinical work" [43].

2.13.2 Management of physical and emotional dysfunction

OT practitioners also address sexuality with their clients with disabilities by providing management of physical problems that may contribute to sexual dysfunction through rehabilitation of physical impairments and adaptive modifications. Some areas of physical impairment addressed by OTs include, tone, endurance, mobility, pain, sensation, anxiety, skin care, and hygiene. Occupational therapists provide education and training in the use of adaptive aids, equipment, and positioning for clients who may require special or alternative support to engage in sexual activity. Psychosocial and emotional problems related to self-esteem, body image, and perception are also addressed.

2.14 Physical therapy and sexuality

PT is a healthcare profession that works to "improve quality of life through prescribed exercise, hands-on care, and client education" [50]. PT practitioners also view the client from all aspects of health, thus including sexuality as an integral component to holistic care of their clients [42]. Physical therapists approach sexuality with their clients by addressing "basic sexual function and anatomy, as well as information regarding male and female disorders of sexual function, including the effects of psychological and social factors" [51]. Some areas of physical impairment addressed by physical therapists include muscle strength, tone, mobility, pain, sensation, and reflexes.

2.14.1 Pelvic floor physical therapy

Along with client education, one specific area in which physical therapists address sexuality in practice is through pelvic floor physical therapy (PFPT). This type of therapy comprises various manual therapies such as neuromuscular reeducation and behavioral modifications. PFPT has been successful in treating many sexual disorders [52]. This functional retraining therapy promotes pelvic floor muscle strength, endurance, power, and relaxation in patients with pelvic floor dysfunction [53]. This treatment explores neuromusculoskeletal causes of pelvic floor disorders and how they affect sexual dysfunction. As with other PT treatments, emphasis is placed on

the muscles, ligaments, and nerves to improve sexual function. PT practitioners identify that sexual dysfunction is related to disorders of the pelvic floor, whether the cause is over activity or inactivity [52]. PFPT provides an effective basis for addressing sexuality with clients using therapeutic interventions such as strengthening and stretching; trigger point and myofascial release; connective tissue manipulation; electrical nerve stimulation; cold laser therapy; and heat and cold therapy.

2.15 Rehabilitation counseling and sexuality

2.15.1 Counseling and education

Rehabilitation counseling is an allied health profession in which the counseling process is used to assist individuals with disabilities in achieving personal, career, and life goals. The counseling process involves communication, goal setting, and beneficial growth or change through self-advocacy, psychological, vocational, social, and behavioral interventions [54]. Rehabilitation counselors have been identified as the health professional clients with disabilities are more likely to discuss personal issues with ([12], p. 16). Rehabilitation counselors often serve as the bridge between the individual with a disability and a self-sufficient, fully integrated life. Certified rehabilitation counselors (CRCs) are equipped to address the topic of sexuality and disability and provide counseling and education with their clients. The impact of disability on sexuality is listed as one of the core content areas for rehabilitation counseling programs ([55], 5H.2j, Section).

Typically, rehabilitation counselors adhere to two professional Codes of Ethics: The American Counseling Association (ACA) Code of Ethics and the CRC Code of Professional Ethics. However, when dealing with the issue of disability and sexuality, neither code offers specific guidelines on the topic. To remain ethical when dealing with issues of sexuality and disability, Rehabilitation Counselors should consider becoming a member of The American Association of Sexuality Educators, Counselors and Therapists (AASECT) [56]. It is also important to become acquainted with certified sexual education resources offered through programs such as Planned Parenthood and Our Whole Lives (OWL). Certified sexuality educators are trained in and adhere to specific ethical guidelines, including issues such as restrictions on genital touching and may therefore have more specific information and resources available regarding sexuality and disability [57].

2.15.2 PLISSIT method

A counselor's response to a client's sexuality concerns can have lasting effects [47]. Given their specialized training in counseling and education, CRCs guide their clients in achieving personal goals related to their sexual health. Rehabilitation counselors can be especially helpful to their clients if they use their disability-related knowledge and rehabilitation counseling skills in conjunction with PLISSIT (Permission, Limited Information, Specific Suggestion, and Intensive Therapy). This is a basic behavioral model of sexuality counseling useful with individuals with disabilities [58, 59]. PLISSIT provides a basis for exploring sexual expression and receiving relevant information on how disability may affect sexuality. The therapy also fosters specific suggestions on how to deal with the effects of disability on sexuality. Through intensive therapy, a client is assisted in coping with issues related to sexuality [58, 59].

3. Conclusion

Individuals with disabilities have the natural biological desires to express and fulfill their sexual desires. As a result, it is imperative that healthcare professionals address sexuality as a part of their intervention in the clinical settings. Although healthcare professionals from various disciplines acknowledge the need to address this intimate topic, there continues to be a disparity between acknowledgement and sexual health intervention as a part of routine care. According to Sengupta and Sakellariou [42], "inclusion of sexuality in education of health care professionals can contribute to integrating this important issue as a routine aspect of practice" (p. 101). Improving the knowledge, training, attitudes, and level of comfortability of the healthcare professional is key in tackling the taboo of sexuality and ensuring clients that it is appropriate to talk about the topic freely. Those who are committed to providing holistic care for people with disabilities will take the necessary actions to stay abreast of issues pertaining to sexuality and disability. There are a number of psychosocial factors that influence the sexuality of individuals with disabilities. In order to determine risk factors and promote protective factors conversations between people with disabilities and counselors and healthcare providers must take place. Moreover, providers have to develop relevant competences, become knowledgeable about sexuality trainings and resources, and be mindful of ethical guidelines. It is also importants for care providers to be cognizant of how certain disabilities and chronic illnesses impact sexuality.

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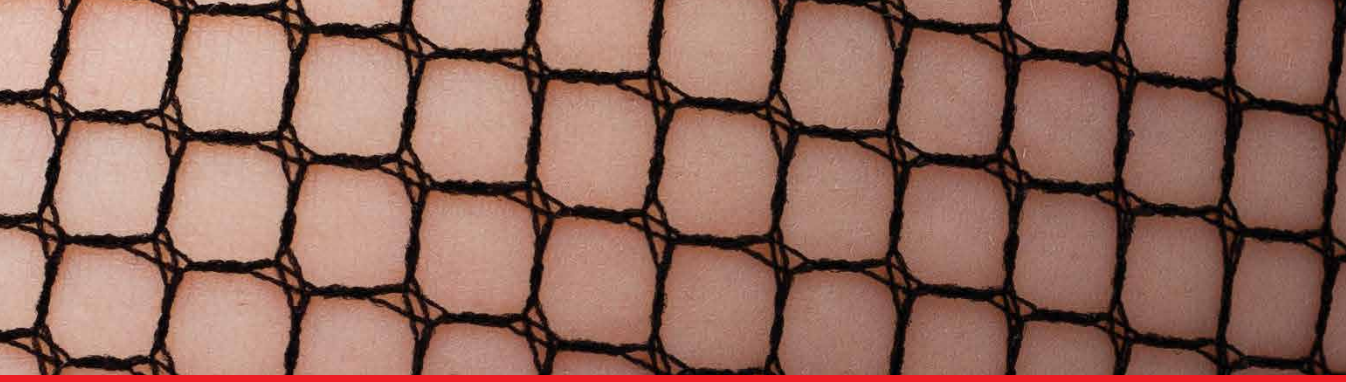

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Sexuality involves anatomical, physiological, psychological, developmental, cultural, and relational factors. These may vary from individual to individual depending upon gender identity, orientation, intention, desire, arousal, orgasm, and emotional satisfaction.The sexual response cycle involves different phases, including excitement, plateau, orgasm, and resolution. These phases may not be the same or follow the same order in different people. This book deals with the origins of human sexuality, sex development, gender, sexual health, sexuality, and disability. The book also gives a bird's eye view of how the COVID-19 pandemic affected human sexuality.

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