Sexual and reproductive health education and learning among Indigenous adolescents of the Comarca Ngäbe-Buglé, Panama

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ABSTRACT

Indigenous adolescents in Panama are at high-risk for sexually transmitted infections, due in part to limited access to condoms and comprehensive sexual and reproductive health (SRH) education. There is a paucity of evidence for how to develop sexual and reproductive health education programmes that incorporate different sources of learning. We used Bronfenbrenner's Ecological Theory to understand two sources of learning: non-caregivers (school or healthcare personnel) and caregivers (parents/grandparents/stepparents). Better understanding sexual and reproductive health learning sources could provide a foundation for the development of targeted, culturally-congruent interventions. This study included ethnographic observation in two Indigenous communities in Panama, followed by semi-structured interviews with young people and caregivers. Findings suggest non-caregiver SRH education was commonly provided by teachers, which is subject to teachers' knowledge and attitudes, and increasingly through the internet. Caregivers focused on topics of abstinence/delaying sexual debut, pregnancy, and STIs/HIV. Condoms were not mentioned by caregivers or adolescents. Traditional SRH teaching by same-gender caregivers was through the rituals of *mokän* (girls at menarche) and *grön* (boys 13-14 years). To most effectively make culturally-congruent interventions, we suggest programmes to improve SRH knowledge and access to condoms, and which respect and build on social and traditional SRH learning spaces.

Keywords: Indigenous peoples, adolescents, caregivers/parental, communication, sexually transmitted infections, sexual behaviours

Introduction

Sexual health, defined by the World Health Organization (WHO) as ´a state of physical, emotional, mental and social well-being in relation to sexuality', requires an approach to sexuality and sexual relationships that values pleasurable experience and promotes respect and safety (WHO 2006). Unfortunately, adolescents and young people around the world often are at higher risk compared to adults for poor sexual and reproductive health (SRH) outcomes, especially unplanned pregnancy, acquisition of sexually transmitted infections (STIs) and HIV, due to a constellation of biological factors, such as immunological immaturity of cervical mucosa in girls; psychological and cognitive factors, such as acquired knowledge and risk-taking behaviours like concurrent partners and condomless sex; and social factors, such as norms related to sexual behaviour and gender norms (Berman et al. 2008, Yi et al. 2012).

Indigenous adolescents in many societies are at even higher risk for infection due to limited access to or greater reluctance to use condoms, limited appropriate health services, and lack of comprehensive SRH education, to develop ´knowledge, skills, attitudes and values [leading to] respectful social and sexual relationships´ (UNESCO 2018). Additionally, Indigenous cultures may not be represented in Western SRH education. For example, there may be differences in the definition and importance given to sexual behaviours, transactional sex and sexual violence, as well as different vocabulary and meanings of body parts, diseases and sexual behaviours (Latifnejad Roudsari R et al. 2013). In urban and rural-Indigenous regions of Panama, young people have been found to have a high prevalence of STIs, which were associated with reporting multiple lifetime sex partners, transactional sex and forced sex (Gabster et al. 2020, Gabster et al. 2016, Gabster A et al. 2019).

Worldwide, SRH interventions for adolescent populations have primarily focused on non-caregiver delivery, often the sex education provided by teachers or peers in school settings. However, the non-caregiver context of learning is essential as young people begin to search outside of caregiver systems for social guidance (Kotchick et al. 2001). Non-caregiver interventions have been successful increasing adequate knowledge and condom use, however there has been more limited success in controlling STI or HIV incidence or overall prevalence (Doyle et al. 2011, Mason-Jones et al. 2016). Group SRH education in non-caregiver environments may be advantageous to influence peer norms surrounding adolescent sexual activity (Kotchick et al. 2001, van de Bongardt et al. 2015). More recently, sexuality education through online learning platforms such as applications and websites has gained popularity as education can be provided this way to a widespread audience (Brayboy et al. 2018). Sexual and reproductive health education has a positive influence on knowledge outcomes, for example on knowledge about STIs and condom use, but less of an effect on biological indicators such as STI incidence (Peskin et al. 2015). Interventions to effectively change behaviours are therefore needed.

The social environment in which children and young people are raised influences SRH. For example, adolescents may learn informally about sexuality from their caregivers (parents, stepparents or grandparents) and more formally through cultural practices. The effect of such

education on sexual health outcomes is less commonly researched and evaluated than school-based interventions. A meta-analysis found that communication with caregivers has been shown to affect the sexual health outcomes of adolescents and to increase the use of contraception and condoms (Widman et al. 2016). However, little research has taken place in Indigenous settings, and there is currently limited data about how Indigenous adolescents learn about sexuality topics in Panama. For example, it is unknown what non-caregiver spaces are used and what topics are covered in the homes of Indigenous adolescents in Panama. Understanding these factors could provide a foundation for the development of culturally-congruent interventions for improved SRH among members of this vulnerable group.

The Comarca Ngäbe Buglé (CNB) is an administratively autonomous Indigenous region in western Panama that is home to over 200,000 individuals of Ngäbe and Buglé ethnicities. Previous research has shown that adolescents and young adults of this region are at increased risk for STIs because of the existence of highly connected sexual networks and low access to SRH education and STI/HIV testing and treatment services (Gabster et al. 2019). Few studies in the locality have documented with whom and where adolescents learn about SRH. Traditional ways of living, rituals and traditional values have declined over the last 50 years and have been inadequately replaced by increased presence of governmental agencies. For example, Ministry of Education schools have increased in number across CNB since the 1960s (Chöli, CNB community leader, oral communication). However, as most teachers in the CNB come from outside the Comarca, the introduction of formal systems of education into communities has led young people to spend less time with their caregivers at home and more time in contexts with influences from outside. However, currently in Panama, no law mandates the development or implementation of SRH education curriculum (Samaniego 2020).

This study aims to describe where and from whom young people learn about SRH and what topics caregivers talk about with adolescents. We used Bronfenbrenner's Ecological Systems Theory of Human Development to guide the research. The Ecological model identifies micro-, meso-, macro- and exo-systems' influence on the contexts in which child and adolescent development occur (Bronfenbrenner 1979). The microsystem includes caregiver(s), as well as non-caregivers, all of whom may affect individual behaviour by influencing decision-making. Within the microsystem, communication and learning about specific sexual health topics can arise from both sources, as well as other non-adult immediate sources such as peers (Bronfenbrenner 1979). In order to implement culturally-congruent SRH programmes for young people in the CNB, it is crucial to understand how adolescents are currently learning about SRH in the CNB. Therefore, we conducted a qualitative study among Indigenous adolescents and caregivers to describe where and from whom adolescents learn about sexuality and SRH, which specific topics and how.

Methods

Study design

We conducted a qualitative study using ethnographic research and semi-structured interviews with 14-19-year-old young people and the caregivers of young people of the same age (unrelated

to the interviewees) in two communities of similar size in the CNB. We triangulated data from these methods to analyse and build a comprehensive understanding of how young people locally learn about SRH (Gill et al. 2008, Yin 2011).

Study methods

The study was undertaken in one community on the southern side and one on the northern side of the CNB Central Mountain Range, between January and March 2018 (Gabster et al. 2019).

Ethnographic research

AG (the primary investigator) undertook ethnographic research for a month in each community, where all family and community members were potential subjects of observation. AG took notes based on a thematic checklist which included understanding where young people obtained information about sexuality. The first ten days were limited to ethnographic observation to give time for community members to become accustomed to the presence of the investigator.

Semi-structured interviews

The remaining days in the month included semi-structured interviews. Purposive sampling was used to identify 20 participants in each community (five girls and five boys in each of two communities) and 16 caregivers (eight in each community, 12 women and four men) for semi-structured interviews. Before commencing the interviews, the objectives of the study were explained, and written consent obtained. Interviews took place in a private location of the participant's choice. The same investigator undertook all interviews in Spanish, as basic conversational Spanish is widely spoken in both communities. A digital recorder was used, and interviews were conducted until saturation of critical themes was reached. Interviews ranged in length from 30-60 minutes. The interview schedule that elicited responses about SRH education is found in Appendix 1. Data saturation for adolescents was reached within 11 interviews, and within 11 interviews with caregivers. However, as other research questions had not yet reached thematic saturation, the process was completed for all interviews.

Data management and analysis

Interviews were recorded using a digital recorder. They were then transcribed and coded into Word and stored on a password-protected computer. In order to analyse and code the data, we used deductive thematic analysis which allowed us to use codes from our conceptual framework while allowing new codes to emerge (Daly J et al. 1998). Themes included places for non-caregiver communication, topics of caregiver communication, and difficulties that caregivers had when communicating with young people. Themes were structured *a priori,* based on places of communication and topics of communication. A thematic map was made with themes. Codes were organised into categories based on those which relate to caregiver and non-caregiver communication. A random 10 per cent of the transcripts were checked for inter-rater reliability

for translation and coding by research assistant ES. Contradictions were discussed and agreed between AB and ES.

Ethical approval

The study protocol was reviewed and approved by the Comité Nacional de Bioética de la Investigación de Panamá, and the London School of Hygiene & Tropical Medicine, UK. After a meeting with study personnel, traditional authorities also gave written approval of the study objectives and methods. All minor participants (aged 14-17 years) were included, only after a guardian signed a consent form and the participant signed the assent form if they agreed to participate. Non-minor participants (aged 18 and 19) signed their own consent form. Adults in the community signed a separate informed consent form.

Findings

Adolescent and caregiver pseudonyms are found in **Table 1.** In interview, young people indicated they often spoke about SRH topics both with non-caregiver adults (teachers, healthcare professionals) and with caregivers (parents, stepparents, grandparents, and other adult caregivers).

Sources of non-caregiver communication

Responses to semi-structured interviews revealed that nearly all communication between young people and non-caregivers was with two adult sources: schoolteachers and healthcare personnel. The Internet was also mentioned as a source of learning.

Caregivers Beli, Aminta, Chäti, Chichigö, Endwä, Chikwö and Merichi reported that teachers at schools were one of the primary sources of SRH learning. Chikwö said 'Adolescents learn about sex at school, I don't need to add anything to their education.' Young people themselves agreed that they learn from school settings. Olí, Merisi, Joti, Tikän and Merina all indicated that they mostly learned at schools from teachers. Buche said 'I'm afraid to talk to my mom about these things, school is better for that'. Buche's attitude was similar to Chikwö's who indicated that schools were preferrable places for learning about sexuality.

Sexuality education with teachers at schools was subject to the teacher's knowledge and attitudes. For example, young people spoke of lessons that could convey potentially stigmatising messages. Gebi and Tikän similarly said, at school we get told by teachers that ´we shouldn't be around people with AIDS, we shouldn't talk to them.' Olí mentioned, 'Teachers have talked about the death disease [e.g. AIDS]… they said we can get it by having sex with animals.' Olí sensed this information was of questionable scientific accuracy.

The second source of SRH learning was through local Ministry of Health (MOH) personnel. Three young men, Chirä, Unchi and Chitani, reported that they obtained condoms from the health

centre, where the nurses sometimes explained condoms were used to prevent HIV. In both studied communities, adolescents noted that the health centre was the only place that provided condoms as they were not sold in stores. Merisi and Buche said that the staff at the health centre in Community A had talked to them about pregnancy prevention. Buche said, 'I have a neighbour who is a nurse… she told me about pills to not get pregnant'. Nechi and Merina reported that they had been to the health centre to ask about receiving the contraceptive implant, but the health centre had run out of supplies.

Caregivers Endwä, Ekwö and Chäti, indicated that topics boys and young men learned at the health centre were superior to what they could teach them; caregivers were happy that young people could learn about sexuality and sexual health matters in that setting. For example, Chäti said, 'They [nurses and doctors] have studied so much, they must know what they're talking about... I don't have any education, so it's better they talk to my son.' Caregivers indicated that because they felt less competent, MOH personnel would be a better information source.

Although less frequently mentioned, the Internet was also identified as a source of information on sexuality. Gebi, Nechi, Merisi, Jochi and Chotikö said they had looked for information online to 'Try to understand things about sex' (Jochi). Nechi and Chitani indicated that sometimes young people look up information online, but searches were limited by expensive airtime and weak signals. Another limitation was the accuracy of the information. Joti indicated that he was worried about getting incorrect information: 'I'd like to know about how to look for a good webpage... I've heard of fake news.' Few caregivers mentioned online learning about sexuality. One exception is Jeli, a caregiver, who said, 'I wish [my daughter] could learn about health, but even if we had the money for airtime, my neighbour said there's bad things [online]. I don't want her to learn [about] those.'

Topics of sexuality communication with caregivers

Three main themes were apparent in sexual health communication with caregivers: 1) delaying sexual debut; 2) pregnancy; and 3) sexually transmitted infections. Notably, other topics such as agency in sexual decision-making, pleasure and well-being were not mentioned.

Abstinence-only and delaying sexual debut

Caregivers such as Merichi, Aminta and Michi, said that they only communicated about abstinence, and then with daughters only. For example, Merichi said 'I tell them it's bad to have sex.' Aminta similarly said, 'I talk to them: sometimes I have to smack them, then I sit them down and tell them, "It's not that I want to hit you, but don't have sex."' Another mother, Michi said: 'I tell my daughter: "Boys want a girl to be a virgin when they unite (get married)". That way I hope she won't want to have sex before she unites.'

The same perspective was mirrored in the interviews with some girls. Mego, Gebi and Melikän, indicated their caregivers provided abstinence-only messaging focused on suffering and death. Mego said, 'My grandmother tells me that men have HIV and to never get near them, so I don't

get infected and die.' Similarly, Gebi said that her grandmother had told her that she should not talk to boys, since, 'If I get pregnant, I might die when I give birth.' Melikän's mother told her that if she talked to a boy, she would get an infection, 'But not only that, I'll get pregnant and abort the baby without her knowing… and then I'll suffer a lot.'

Whilst some caregivers preferred abstinence-only messaging, others used a delaying-sexual-debut-approach. Caregivers Beli, Titi, Aminta and Merichi said they communicated with their daughters about waiting to have sex. Titi indicated an age cut-off, 'She is 13, and I tell her that at 13, a girl is still too young, wait till 18.' Aminta similarly communicated to her daughter that she should wait to have sex until 18 years, 'or even older… but I don't prohibit sex, it's a natural thing to do.' Almost all caregivers discussed delaying sexual intercourse for girls, not boys. One exception is Beli, who said, 'I tell my son, "When you are 19 or 20, you can have one girlfriend. One! Now that you're 16, no girls."'

Comenchi, Buche, Merisi, Nechi and Unchi also said their caregiver had talked to them about delaying sexual debut. Nechi, for example, said 'Sometimes my mom says that if I want to have a relationship, I should wait 'til I'm older and not rush, and to make sure that they're not sick down there.' Merisi said, 'I was 12 and I wanted a boyfriend, my grandmother wouldn't let me have one, only when I would be 15… she wanted to make sure that I waited until I was 15 to have sex.'

Pregnancy and prevention

The topics of pregnancy and contraception were brought up by caregivers only; young people only mentioned pregnancy, as described above, in the context of abstinence (i.e. non-abstinence leading to risk/consequence). Discussions between caregivers and adolescent girls on pregnancy focused on dropping out of school. For example, Ekwö wanted her daughter to complete school before having children: 'I tell her, "Get an education first because if you become a mother first, you won't finish school."' Meliti added that she told her daughter that if she got pregnant and dropped out of school, she would not get a job, and would have 'to rely on the man for everything.'

Although pregnancy was a common discussion topic between caregivers and daughters, however most caregivers did not indicate to adolescents exactly how to prevent pregnancy. In two exceptions, Nechi and Meliti said they would help their daughters get contraception. However, daughters would need to tell them they were having sex. Meliti said, 'With pills, she can continue studying… a baby would be a setback for her education'. For the young women interviewed, a barrier to the contraception use was informing their caregivers that they were sexually active. Discussion about condoms and condom use between caregivers and adolescents was noticeably absent.

Sexually transmitted infections (STIs)

Only a few caregivers said they talked to young people about STIs. Two caregivers, Merichi and Medigö, said they told their sons to find a girlfriend without any STIs: 'I tell my boy that he's allowed to have a girlfriend, but not one who has diseases down there' (Merichi). Both Merichi and Medigö said they did not want son to get an STI, but they did not discuss condoms. Jeli spoke to her son about HIV: 'I tell my son that HIV is deadly.' However, she did not specifically mention how to prevent an infection, only that the son should avoid it. While the mothers of adolescent boys said they talked to their sons about STI prevention, no caregivers indicated talking to their daughters about STIs.

Unchi, Chirä, and Chitani, indicated that their parents showed concern about their health and said that girls could be the source of infection. Chitani said his uncle told him, 'Be careful, there's a lot of AIDS around among girls'. Unchi was similarly warned: 'My dad said, "Be careful with women, they have a lot of diseases"'. Other STI/HIV prevention messages, such as condom use were not mentioned. Girls and young women interviewed did not mention discussion about STI with caregivers.

Difficulties caregivers face in talking about sexuality

Most caregivers spoke of the difficulties they face when speaking with young people about sex and sexuality, particularly through lack of confidence or awkwardness. Caregiver, Chäti said: 'Parents know they should open up to their kids about sex, but we don't feel like we know enough.' Both Medigö and Aminta felt that it was difficult to talk to young people who they thought were too sexually inexperienced. Aminta said: 'For me, it is hard to talk about sexuality because I see her as a little girl… but once she knows what sex is like, then it will be easier to get into talking.' These caregivers perceived topics of sexuality to be experience-dependent; talking about sex-related topics before debut would not be suitable.

Young women, Unchi, Merisi and Beli indicated they felt they could not talk to a caregiver about sexuality because their caregiver lacked knowledge about the subject. For example, Unchi said, 'Usually women are often not taught about sex… so they couldn't ever teach it.' In a similar tone, Merisi said, 'My grandmother doesn't know how to write, she couldn't tell me how to use a condom.' Another substantial barrier for caregiver SRH communication was the cultural norm for this to be undertaken by a member of the same sex. Michi, Belisi, Medigö, Beli, Jeli and Edwö said that it was customary in the Comarca for caregivers to talk to young people of the same sex. Jeli, a single mother, indicated that she had given her son some condoms but had not explained how to use them because, 'There are no men in the house to tell him how to use them, that's something men should talk about.'

Interviews with young people themselves confirmed the presence of these cultural norms. Bechi, Buche, Merina, Tächi and Chötiko said they would only be comfortable talking to a same-sex caregiver. However sometimes, as Olí and Joti indicated, their same-sex caregiver was rarely around. Olí said, 'I never see my dad long enough at home to have a conversation about sex. He just comes in, eats and then leaves.'

Traditional ways of learning

Our ethnographic enquiry revealed that women community members spoke of traditional coming of age rituals such as *mokän* (for girls) and *grön*/*krön* (for boys). There is little written information about *mokän*, and even less about *grön*. Information about the rituals arose during conversation with community leaders Chäti, Jechi and Melitikän. *Mokän* and *grön* was a harsh practice which included the isolation of the girl from her family during the week of her menses. When the *Mama Tadta* (a Ngäbe-Christian cultural-religious sect) religion became prominent in the 1960s, these practices were classified as unacceptable. Additionally, with the growth of government schools in the region, *mokän* and *grön* have become less popular.

The ritual of *mokän* has changed to a milder version in the last decades. The primary objective of *mokän* was to teach about values, social norms and cultural valorisation at menarche. During *mokän*, grandmothers and other women elders were actively involved in the ritual. When a girl informed her mother or grandmother of her menarche, she would be separated for five days from her social life with family and friends; for a month she would take on a strict diet. The older women in her life would teach her how to maintain hygiene, behave as a woman in society. This included how to behave as a wife, and how to perform domestic duties such as weaving plant fibre bags (*krä*), sewing traditional dresses (*ñaguas),* cooking and cleaning. After keeping the diet for one month, her family and community would then welcome her back into the community as a woman. If not already betrothed, her family would aid her in starting the process of looking for a male partner. Presently, however, *mokän* is practised in a gentler manner where at menarche, girls are taught to make *kräs*, sew *ñaguas* and are expected to take up a heavier domestic workload of helping with cooking and washing clothes, but isolation is rare.

Boys' *grön* or *krön* occurred when the boy was around 13-14 years. This ritual was less commonly discussed during the ethnographic research, possibly because the researcher was a woman. Chöli and Ülä indicated that *grön* had not been practised in nearly a century. *Grön,* undertaken late at night and in the early morning, was perceived as a time set apart for older men in the family to prepare boys to be a man in "all the senses possible". According to Ülä, boys would assume the tasks delegated to men in society, including clearing the forest with a machete, planting food, hunting, making arrows or woven hats. Boys also learned how to be a husband and about body hygiene.

When asked about the value of reactivating *grön* and *mokän* as a means to undertaken sexual health education*,* Chöli and Ülä indicated they felt topics could be developed with Ngäbe traditional leaders to ensure cultural appropriateness while maintaining scientific accuracy.

Discussion

Findings in this qualitative study suggest that young people of the CNB receive SRH education about topics such as abstinence/delaying sexual debut, pregnancy and STIs from non-caregivers and caregivers. The topics and quality of education varied by who was giving the education and the gender of the adolescent receiving it. We had five notable findings in this study. Firstly, caregivers used scare tactics with adolescent girls to implement abstinence education. Secondly, there was a marked absence of condom-use education among caregivers and non-caregivers. Thirdly, SRH education given by teachers in schools was of questionable quality. Fourthly, the

Internet may play a role in SRH teaching in CNB. Lastly, adolescents and caregivers felt difficulties in communicating with each other. These findings are discussed below, and in relation to implications for policy and practice.

Adolescent girls perceived caregiver abstinence-only communication to be focused on death and suffering if the adolescent engages in sex. Scare tactics is a common public health marketing technique used in the past to elicit anxiety and fear in a person in order to modify behaviour (Simpson 2017). When backed by appropriate arguments and knowledge, these techniques could work for topics such as smoking and drunk driving (Simpson 2017). However, in sexuality education, young people often feel they are inappropriate; consequently, adolescents may engage more often in riskier behaviours such as condomless sex (Kantor 1993, Stanger-Hall and Hall 2011). Instead of abstinence-only messaging, interventions focused on risk reduction may increase the age of debut (Barth 1989, Howard and McCabe 1990, Kirby et al. 1994). Comprehensive sexuality education messaging could include positive messaging surrounding knowledge and skills to delay sexual debut as well as information on birth control and condoms. This type of education is currently the most appropriate model for preventing poor sexual health outcomes among adolescents (Kohler et al. 2008). Additionally, such holistic models could include other sexuality topics such as intimate partner violence and could promote autochthonous cultural-based norms (Le Mat et al. 2019).

Interestingly, neither caregivers nor adolescents mentioned learning about the use of condoms as a prevention technique. Instead, caregivers vague indications of 'taking care'. Condoms are a primary STI/HIV and pregnancy prevention tool when modern contraceptives cannot be easily used. However, access to condoms is low in the CNB (Gabster et al. 2019). In the CNB, in the absence of large community distribution programmes, health centres alone ensure condom access. If community-wide access was improved, support or promotion through caregiver and other adult communication interventions would be a potential STI/HIV and pregnancy prevention intervention. Several studies have found positive associations between caregiver communication about condoms and actual use by adolescent girls (Aspy et al. 2007, Pick and Palos 1995, Widman et al. 2016).

Teachers in schools were most often mentioned as the source of non-caregiver SRH information by caregivers and adolescents. Yet, adolescents reported obtaining incorrect and even discriminatory SRH information from schoolteachers, especially regarding HIV. Without a unified curriculum, school-based sexuality education may be subject to incorrect information and bias that the individual teachers hold (Bay-Cheng 2003). Panama currently does not have a national standardised school-based sexuality curriculum; however, the Ministry of Education is planning to initiate a piloting scheme in 2021 (Samaniego 2020). Nevertheless, there is ongoing concern that a national curriculum may exclude specific Indigenous (in this case, Ngäbe and Buglé) cultural norms, including gender-segregated learning and the broad-spectrum of gender norms in courting, the decision to engage in sex and the decision to use a condom (Gabster et al. 2019).

Both caregivers and adolescents mentioned the internet as being increasingly relied upon as a source of information on SRH, despite the barriers to connectivity and airtime costs. Materials

may be pre-downloadable on school-based Wi-Fi hotspots; internet hotspots have increased across the CNB due to COVID-19 online learning. A systematic review conducted in high-income and a few low- and middle-income countries concluded that cell phone-based interventions with access to internet and text messages had been successfully used in sexual health promotion campaigns, using both 'on-demand' sexual health information and periodic 'push' messaging (L'Engle et al. 2016). A well designed, appealing, adapted and free internet intervention could increase access to correct sexuality information in CNB but runs the concurrent risks of accessing misinformation and myths propagated by some social media, as well as violent pornography, which may undermine its aims.

Both caregivers and adolescents often spoke of the difficulties in communicating with each other about sexuality topics. Gender-dependent learning may be more difficult due to the absence of a caregiver. Other studies have found that caregivers may feel embarrassment or lack of competence in talking about sexuality with adolescents (Hockenberry-Eaton et al. 1996, Widman et al. 2016), despite recognising the importance of this education (Hu et al. 2012). Further complicating this relationship is the low rate of high-school completion among adults of the CNB (De León et al. 2018), which may create feelings of inadequacy and self-doubt.

Limitations

This study had three main limitations. First, we only interviewed participants in two communities in CNB, and only four male caregiver participants being interviewed, raising issues of inclusiveness and representativity. That said, the sites investigated comprise relatively large communities in two of the three regions of the CNB and were broadly comparable in size and population density. Importantly, we found consistent results between the sites and reached data saturation regarding caregiver communication on topics of sexuality relatively quickly. Second, the interviewer was an ethnically white North American woman which may have triggered respondent bias. Conversely, such externality might have helped increase openness regarding the information shared, since there was lower potential for local gossip. Third, because the interviewer was not fluent in the local languages (*Murire* or *Ngäbere*), interviews were limited to those who spoke basic conversational Spanish, resulting in selection bias, although it should be noted that three-quarters of individuals from all age groups in CNB have at least some schooling in Spanish (De León et al. 2018).

Implications for policy and practice

Based on these findings, we have developed five implications for policy and practice which form a series of theory-based interventions focused on capabilities, opportunities, and motivations for SRH within a specific context, as described by the Behaviour Change Wheel (Cassidy et al. 2019). The implications focus on overall sexual wellbeing including safe and pleasurable experiences, not merely the absence of disease, as defined by World Health Organization (WHO, 2006)

Firstly, teachers and parents could have access to and be trained in, evidence-based, comprehensive sexuality education before teaching it (UNESCO 2018). Secondly, adolescents and

caregivers mentioned online interventions, which could be developed with SRH specialists to maximise an evidence-based intervention and should be readily accessible even in off-line settings by permitting pre-downloadable free material. Thirdly, condom interventions could focus on promotion through community-wide campaigns, healthcare personnel, teachers and caregivers to normalise their use for STI and pregnancy prevention simultaneously in addition to increasing access to contraceptives. Fourthly, since gender-segregated sexual health education was most comfortable and acceptable to caregivers and adolescents, it may be advantageous for group teaching to consider same-gender teachers and groups. Fifthly, the *mokän* and *grön* traditional coming of age and SRH rituals could be revived and revised for contemporary use. While these rituals have fallen out of favour, the SRH information has not been adequately replaced. If led from the community, these rituals could be adapted to be a comprehensive, adolescent SRH intervention. For example, traditional leaders could influence methods of implementation, while evidence-based content could be used to recreate an intergenerational, same-gender learning space as part of a culturally adapted curriculum on sexual health. Furthermore, community-led education could be undertaken in Ngäbere or Murire languages, which would bypass language barriers that may still be felt by some community members and adolescents. Including both community adults and family members has been identified as important in SRH learning in a large study in Bolivia, Ecuador and Nicaragua (Córdova et al. 2015). The CNB curricula could be developed with SRH experts to assure evidence-based comprehensive content; the programme should be age-dependent, beginning pre-*mokän* and pre-*grön* and continuing into older adolescence. There are few Indigenous frameworks that have been used for culturally-congruent SRH interventions. One notable framework has been used as culturally-congruent SRH interventions among the Maōri people of New Zealand. The framework focused on identifying knowledge and social teaching systems to situate the health-promoting cultural practices as part of the solution for sexual and reproductive well-being in the topics of relationships, reproductive responsibility, and contraception (Le Grice and Braun 2017). Further research could be undertaken to guide the development and implementation of the programme. Lastly, since caregivers and adolescents in CNB felt that communicating about SRH topics was difficult and awkward, developing a caregiver-adolescent communication model may be advantageous. A school-based caregiver-adolescent communication model was used successfully in a study in Uganda (Katahoire et al. 2019).

Conclusions

Findings from this study provided an evidence base for including caregiver and non-caregivers in programmes to increase SRH knowledge among Indigenous adolescents in Panama. Implications for policy and practice include the need for cultural congruence to enable greater potential for success. Activities and programmes should be developed with community leaders and members as well as SRH experts to ensure a relevant and accurate approach. Further research is needed to guide appropriate development and implementation.

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Disclosure statement

The authors declare no conflict of interest.

Data availability statement

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to ethical restrictions, as they contain information that could identify and therefore compromise the privacy of research participants.

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Table 1. Participant pseudonyms

Young people

Pseudonym	**Gender**	**Age**	**Community**
Mego	Girl	18	A
Merina	Girl	18	A
Nechi	Girl	16	A
Mechi	Girl	14	A
Comenchi	Girl	17	A
Tikän	Boy	17	A
Chitigön	Boy	19	A
Unchi	Boy	19	A
Chirä	Boy	18	A
Olí	Boy	17	A
Bechi	Girl	17	B
Gebi	Girl	16	B
Buche	Girl	15	B
Melikän	Girl	19	B
Merisi	Girl	18	B
Tächi	Boy	17	B
Joti	Boy	18	B
Chitani	Boy	15	B
Jochi	Boy	18	B
Chotiko	Boy	19	B

Caregivers

Pseudonym	**Gender of participant**	**Age**	**Community**
Beli	Woman	35	A
Titi	Man	41	A
Meliti	Woman	39	A
Ekwö	Woman	44	A
Medigö	Woman	30	A
Belisi	Woman	33	A
Merichi	Woman	35	A
Aminta	Woman	34	A
Chäti	Man	43	B
Michi	Woman	42	B
Jeli	Woman	39	B
Chikwö	Man	34	B
Endwä	Woman	55	B
Milidikön	Woman	37	B
Chichigö	Man	51	B
Nechi	Woman	46	B

Appendix 1

Interview topic guide

Caregiver topics

1. What strategies do you use to communicate with your adolescent about sexual activity? How does talking to male and female adolescents about sexuality differ?
2. What are topics about sexuality that are difficult to talk about with your adolescent son or daughter? What topics are easiest?
3. How do you talk about pregnancy with your adolescent son or daughter?
4. How do you talk about STIs with your adolescent son or daughter?
5. Where else can your adolescent son or daughter receive information about sexuality?
6. How would you feel if your adolescent son or daughter had sexual relations?
7. How would you feel if your adolescent daughter had sexual relations?
8. What would you do if your adolescent son or daughter had an infection in their genital (male/female) parts?

Young person topics

1. Could you tell me a little about your life and the romantic relationships you have had?
2. Who is the person who most looks after you (your primary caregiver)?
3. Tell me a little about who this person is.
4. Tell me a little about the rules that this person has about you having a boyfriend or girlfriend.
5. What would this person say if they thought you were having sexual relations with your boyfriend or girlfriend?
6. What would this person say if they thought you were having sexual relations with someone who is not your boyfriend or girlfriend?
7. Who else have you talked to about these topics?