Original Article

Assessment of Sexual and Reproductive Health Information Needs among Middle-Aged FELDA Youths: A Focus Group Discussion and Nominal Group Technique

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Abstract

Background: **Unsafe abortion, rape, and incest cases involving The Federal Land Development Authority (FELDA; Malay: Lembaga Kemajuan Tanah Persekutuan) youth have been reported annually. Their distinct sociocultural context may contribute to reduced access to existing sexual and reproductive health (SRH) information. A local study reported a low level of SRH knowledge among Malaysian youth. This study aims to explore SRH information needed to develop a conceptual model and prioritise topics for the FELDA youth intervention.**

Methods: **This study used purposive sampling to recruit participants for two focus group discussions involving FELDA youth aged 18 years and above, who studied at a university in Selangor and Pulau Pinang. Semi-structured questions were used to guide the discussions until data saturation was achieved. The nominal group technique was subsequently used to prioritise topics of interest related to SRH. The sessions were recorded, transcribed, and translated into English.**

Results: **A total of 18 participants were involved; the majority were female, single, and Malay. All participants were pursuing undergraduate studies. Thematic analysis generated five themes, comprising 18 subthemes, and a total of 34 codes. The nominal group technique identified 13 SRH topics agreed upon for intervention. Participants suggested developing an interactive module with a catchy tagline, more illustrations, and a short duration for each topic.**

Conclusion: **The SRH information needs of FELDA youth were well-suited to the conceptual framework, and 13 SRH topics were prioritised for inclusion in the FELDA youth intervention project. By addressing these topics, which participants considered important and engaging, the intervention supports their intention to acquire relevant knowledge.**

Keywords: *sexual and reproductive health information, needs assessment, youth, focus group discussion, rural population*

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Introduction

Globally, an estimated 374 million cases of syphilis, gonorrhoea, chlamydia, and trichomoniasis were reported among adults in 2020 (1). In Malaysia, males account for higher proportions of syphilis and gonorrhoea cases than females, while youth represent a substantial proportion of syphilis, gonorrhoea, and HIV infections (2). Concurrently, rising sexual and reproductive health (SRH) concerns, including unsafe abortion and sexual violence, suggest patterns of early sexual initiation, multiple partnerships, and high-risk behaviours among adolescents (3). Reports of unsafe abortion, rape, and incest involving Federal Land Development Authority (FELDA) youth further illustrate these vulnerabilities. Negeri Sembilan recorded ten incest cases within a year, while a 2020 case in Johor involved a father sexually abusing his daughters (4, 5). More recently, a 25-year-old woman in FELDA Negeri Sembilan terminated a 17-week pregnancy and concealed the foetus (6). These issues, situated within a distinct sociocultural context, may limit access to accurate and confidential SRH information.

In Malaysia, socioculturally tailored SRH education has been integrated into school curricula (7). However, despite the availability of guidelines and educational materials from multiple agencies, youth knowledge and awareness remain suboptimal (8). Alternative approaches, including mobile-based, game-based, and family-mediated SRH education, have demonstrated effectiveness in improving youth engagement (9). Social media also plays a significant role in shaping SRH-related awareness, attitudes, and behaviours (10). Platforms managed by nongovernmental organisations and public health bodies provide accessible SRH information; however, concerns persist regarding misinformation, exaggerated content, and peer-driven norms that may encourage risky behaviours (11–16). These exposures are associated with early sexual activity, low contraceptive use, an increased risk of sexually transmitted infections, and unintended pregnancies (17, 18). Recognising social media as a sociocultural determinant is essential for understanding rising SRH trends and informing targeted, evidence-based interventions for youth (19).

Effective programmes require comprehensive needs assessments to identify knowledge gaps, attitudes, and practices within relevant contexts (20). This study explores SRH information needs among FELDA youth to guide culturally sensitive, context-specific interventions for rural populations (21, 22).

Methods

Study Design

A qualitative study was conducted using purposive sampling among Malaysian youth from FELDA settlements. The research followed the Standards for Reporting Qualitative Research (SRQR) (23), was registered with the National Medical Research Register, Ministry of Health Malaysia (NMRR ID-24-03784-TBG), and obtained ethical approval from the research ethics committee (JEP-2024-939).

Study Setting

Participants were FELDA youth from the FELDA Students' Council (PERSADA) studying at public universities. The first focus group discussion (FGD) involved eight FELDA youth studying at a local university in Pulau Pinang, while the second involved ten FELDA youth studying at a local university in Selangor. Eligible individuals were aged 18 years and above, provided informed consent, and were proficient in Malay or English. Those who were medically unfit were excluded. Participants were invited by telephone, briefed by the researchers, and attended sessions in prebooked university meeting rooms.

Data Collection

Participants received study information sheets from the researchers, with the right to withdraw at any time. Written informed consent was obtained, and unique identity codes were used to ensure anonymity. All participants consented to audio-visual recording and anonymous verbatim reporting. Figure 1 illustrates the study's data collection flow.

Demographic Information

Basic demographic information was collected using a Google Form. Participant characteristics included age, gender, ethnicity, marital status, educational level, residential area, and state.

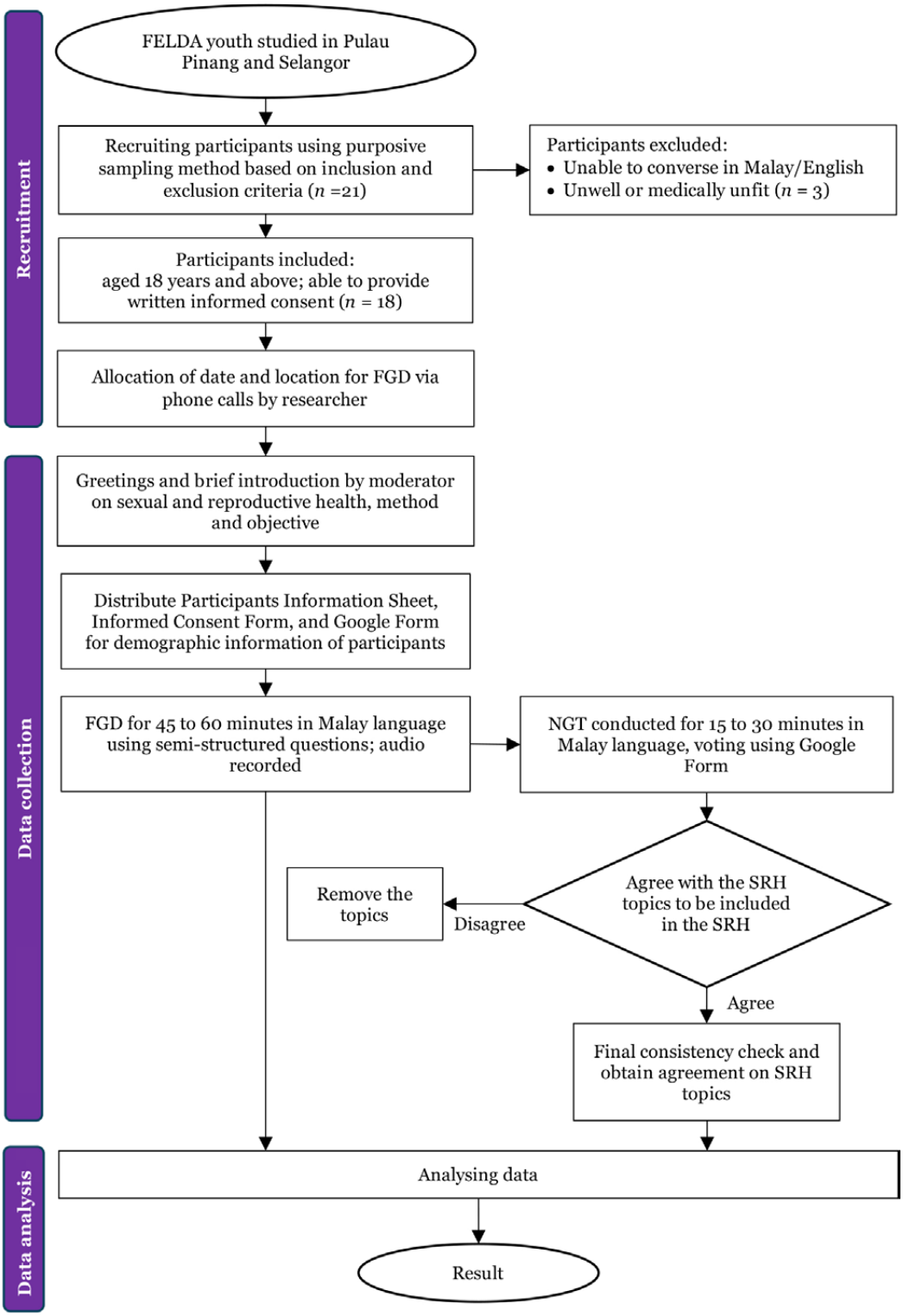


Figure 1. Flow chart of focus group discussion and nominal group technique.

Focus Group Discussion

Two FGDs were conducted at separate locations. Evidence suggests that two to three FGDs can capture up to 80% of key themes in homogeneous populations (24). A semi-structured guide explored SRH needs, including knowledge, beliefs, barriers, and enabling factors. Section A addressed premarital pregnancy, sexually transmitted infections, and contraception; Section B examined information sources, service access, sexual activity, and communication; and Section C focused on challenges in existing SRH programmes and digital influences on sexual behaviour. The full guide is provided in Supplementary 1. The guide underwent independent qualitative validation by three experts, with consensus achieved to ensure content validity. FGDs were conducted primarily in Malay, with English medical terms used for clarity, and continued until data saturation was reached. Sessions were led by an experienced moderator, supported by a note-taker. Four additional researchers contributed to data analysis and manuscript preparation.

Nominal Group Technique

The nominal group technique (NGT) followed the FGDs and was used to determine priority SRH topics. Participants defined relevant topics, generated ideas silently, shared them in a round-robin manner, clarified and discussed agreement or disagreement, and then prioritised the most essential topics for youth. A voting system using Google Forms with a five-point Likert scale (1 = strongly disagree to 5 = strongly agree) was developed during the discussion. With N = 18, item scores ranged from 18 to 90. Agreement on the SRH topics to be included in the intervention was discussed, followed by a final consistency check to confirm consensus.

Data Analysis

Descriptive analysis of demographic data was conducted using IBM SPSS version 31 (version 31; IBM Corp., Armonk, NY, USA). FGD audio recordings were transcribed verbatim, anonymised, translated as necessary, and analysed using a deductive, theory-driven thematic approach (25). Coding and theme development were performed in Microsoft Excel, with investigator triangulation among three researchers to increase rigour (26). Emerging themes were synthesised into a conceptual model adapted from Maslow's hierarchy of needs, encompassing physiological, safety, love and belonging, esteem, and self-actualisation (27). This model provides a structured framework to inform the design and implementation of future SRH interventions for FELDA youth.

Results

Demographic Characteristics

A total of 21 participants were willing to participate in the study; however, only 18 participants were present. The excluded participants were unwell or did not provide written informed consent. Table 1 shows the participants' profiles. All 18 participants were Malays aged 20 to 24 years. Most of them were female, single, and undergraduate students enrolled in nonmedical courses. They came mainly from rural areas across several states and were involved in youth sports, leadership, technology, and entrepreneurship programmes, with fewer having experience in health or education initiatives.

Table 1. Sociodemographic characteristics of participants (N = 18).

Characteristics		*n* (%)
Age (years)	20	2 (11.1)
	21	3 (16.7)
	22	11 (61.1)
	23	1 (5.6)
	24	1 (5.6)
Gender	Male	3 (16.7)
	Female	15 (83.3)
Ethnicity	Malay	18 (100.0)
Marital status	Married	2 (11.1)
	Single	16 (88.9)
Educational level	Diploma	1 (5.6)
	Degree	17 (94.4)
Residential area	Rural	13 (72.2)
	Suburban	5 (27.8)
State	Johor	5 (27.8)
	Melaka	1 (5.6)
	Pahang	6 (33.3)
	Perak	1 (5.6)
	Sabah	1 (5.6)
	Selangor	2 (11.1)
	Terengganu	2 (11.1)

Themes, Subthemes and Codes

Thematic analyses generated five themes, comprising 18 subthemes, which are listed in Supplementary 2. In total, 34 codes were extracted from two FGDs involving 18 participants. Approximately 80% of the interview transcript text was extracted as relevant quotations. All participants contributed multiple quotations across the themes. Below, we present illustrative quotations that highlight the core meaning of the five themes and discuss the subthemes and code structure. The five themes were: i) physiological needs; ii) safety needs; iii) love and belonging; iv) esteem; and v) self actualisation.

Theme 1: Physiological Needs

Five sub-themes were identified: i) menstrual health knowledge; ii) information on safe pregnancy; iii) information on high-risk pregnancy; iv) diseases of the reproductive system; v) knowledge of contraceptives.

Menstrual health knowledge was relatively well established among female participants. Although there was some recognition of menstrual hygiene, understanding of menstrual abnormalities, such as menorrhagia, and hormonal influences on menstruation remained limited. Male participants demonstrated low confidence in their knowledge of menstruation but emphasised its relevance to the health of their future spouses or daughters. Overall, there was insufficient understanding of the physiological processes underlying menstruation.

> I think it's kind of important to know about the menstrual cycle. At least next time, I can explain to my future wife and even guide my daughter. (Y4, male, single)

> Menstrual hygiene? I know that one... must change pads often, keep the area clean, wash properly, and also throw pads the right way. If not, you can get an infection, right? (Y13, female, single)

> Diseases related to menstruation? Err... I'm not really sure. I only know about period pain, that's all. (Y5, female, single)

Generally, participants expressed a good knowledge of safe pregnancy. Some participants were not aware that being very young during pregnancy is risky and requires regular follow-up at the antenatal clinic.

> I don't know that being too young, having health problems, or not getting check-ups can make it dangerous. (Y6, female, single)

Participants were not aware of diseases that may cause high-risk pregnancy among youth. Knowledge of high-risk pregnancy was generally poor. The care and follow-up related to high-risk pregnancy are not known to the participants.

> Honestly, I don't really get what they mean by high-risk pregnancy... like, what makes it risky, ah. (Y17, male, single)

> I guess youth won't have diseases like hypertension or any other illness. I don't really know how they take care of that, like special check-ups or what. (Y9, female, single)

Knowledge of diseases related to the reproductive system was generally poor. Although cervical cancer was a known disease, its methods of prevention were often unclear. Participants were generally unaware that human papillomavirus (HPV) vaccination can prevent cervical cancer and HPV infection. While some other diseases of the male and female reproductive organs were occasionally mentioned, there was a general lack of understanding regarding the signs and symptoms of each condition.

> HPV vaccine? Umm... not really sure what it's for; is it only about flu or something? (Y11, male, single)

> Umm... I'm not really sure about the signs for male reproductive disease... I never learned about that before. I am also shy to ask my spouse and friend. (Y8, female, married)

Knowledge of contraception was generally poor. Although condoms were recognised as a contraceptive method, their functions and effectiveness were often unclear. Other contraceptive methods were sometimes mentioned, but there was a general lack of understanding regarding the different types and methods of contraception.

> I always thought contraceptive pills were only for married people. (Y2, female, single)

> I mean, I've heard about contraception, but like... what types are there? Is it just condoms? (Y4, male, single)

Theme 2: Safety Needs

Four subthemes were identified: i) reproductive health services; ii) SRH rights; iii) sexual health on the internet; and iv) myths about sexual health.

Participants infrequently visited reproductive health services, as most were unmarried. Participants were eager to know which facilities offered these services because they rarely fell sick and were usually at school during the time when such services were available.

> I think we should know what services are available, like STI testing, counselling, or birth control, instead of relying on the internet. (Y3, female, single)

> I remember a doctor giving a talk about sexual health during my secondary school. Isn't the doctor from our government clinic? (Y8, female, married)

> I didn't know there was a special youth-friendly clinic until one day I had to bring my younger sister to the clinic for a health screening test. (Y3, female, single)

Knowledge of SRH rights was limited. Some participants agreed that reproductive health education provided at school was merely a formality and that many other subjects were considered more important.

> We learnt less about sexual health in school, but I think it's only for adults or married people to know about. Too many academic subjects need to be covered. (Y4, male, single)

All participants agreed that the internet provides abundant information on SRH. However, they expressed concerns about exposure to the dark web and pornography. Youth rarely accessed educational websites or verified sources. Participants suggested being guided towards trusted and recommended websites or portals for obtaining accurate SRH information.

> There's so much reproductive health info online, but I don't know which websites are actually reliable. I wish someone could tell us the official ones. (Y8, female, married)

> If there were more fun educational websites, I'd probably visit them instead of gaming; learning doesn't have to be boring. (Y11, male, single)

> Schools tell us not to watch pornography, but they don't explain the impact like how it might change our thinking about sex or people. (Y6, female, single)

> I've heard about the dark web on YouTube, but I don't really know what happens there. Is it really that dangerous? (Y6, female, single)

Myths about sexual health were debated among participants. Participants demonstrated that these topics were highly relevant to them and needed to be discussed, highlighting the need for accurate information.

> Eh, I heard people say women can't get pregnant if it's their first time. True ah? (Y4, male, single)

Theme 3: Love and Belonging

Three subthemes were identified: i) healthy relationship; ii) sexual behaviour; and iii) sociocultural impact on sexual health.

Generally, participants agreed that a healthy relationship may bring happiness to couples. However, some participants were not aware of the characteristics of a healthy relationship or its benefits for SRH.

> Couples who communicate well are more likely to discuss contraception and sexual health. Is that how couples protect each other? (Y2, female, single)

Participants expressed concerns about the sexual behaviour of students. Although premarital sex was mentioned, prevention methods were often unclear to them. Homosexuality was another issue raised; however, there was still a lack of preventive measures related to different sexual behaviours.

> When I found out about my friend, I got scared. What if she gets pregnant or infected with HIV or something else? I don't think the youth are ready to handle the problems. (Y8, female, married)

> I think we really need to talk about homosexuality in our university. It occurs around us, and ignoring it won't make it go away. (Y15, female, single)

SRH remains taboo in Malaysian society. The impact of sociocultural factors on sexual health is fairly well understood. One participant experienced a cultural reluctance in discussing sexual health with a close family member.

> I feel weird if my mum talks about relationships or sex. That's not something we usually discuss at home. (Y7, female, single)

Theme 4: Esteem

Four subthemes were identified: i) personal choices; ii) mental condition related to reproductive health; iii) engagement; and iv) reward.

Personal choice and awareness were relatively well understood. In cases of premarital conception, the decision either to continue or terminate the pregnancy is made by both parents; however, participants agreed that the girl herself must have the right to make her own personal choice.

> Some people might pressure the girl, but I think it's a personal choice. No one else should decide if or when she wants to have a baby. (Y4, male, single)

Participants had little knowledge of mental conditions related to SRH. Female participants had speculated about postpartum depression, but their understanding remained unclear. Participants' limited awareness of the consequences of having SRH problems may affect their mental status.

> Mental illness is about depression or anxiety, right? What does that have to do with sex or relationships? (Y1, female, single)

> In my family, people don't really talk about mental health, so I didn't know infertility could make someone feel depressed or stressed. (Y1, female, single)

Engagement is the key to every educational intervention. Participants suggested using quizzes or games.

> I remember things better when I play a game compared to just reading text. (Y4, male, single)

> I play games on my phone all the time. If the module had a game-style activity, I'd definitely use it more often. (Y7, female, single)

Reward was considered a form of appreciation for users, particularly upon completion of the learning materials. Participants suggested providing rewards.

> Getting a reward after completing a quiz would make me want to continue to the next level. (Y7, female, single)

Theme 5: Self-Actualisation

Two subthemes were identified: i) illustration; and ii) time spent. Illustration was the most important suggestion made by the participants.

Participants suggested a self-guided learning module for the intervention and preferred infographics, which they considered better for understanding. Participants suggested using less text and more graphics.

> I like learning by myself. If I had an interactive module, I could explore the topics whenever I'm ready. (Y11, male, single)

> Honestly, I don't like reading long texts. I prefer the module that uses more visuals or infographics. (Y2, female, single)

> When there's too much text, it's hard to understand what's important. Shorter text would help me remember better. (Y5, female, single)

The time spent on the intervention was discussed among the participants. Most of them preferred shorter durations.

> I'm always busy with classes and assignments. I'd rather have a quick, 5- to 10-minute module than something that feels like another subject. (Y3, female, single)

> I usually study on my phone or tablet between classes. I need short lessons I can finish fast, not long texts that take forever. (Y11, male, single)

The key themes regarding the needs of youth from FELDA, particularly in the context of SRH education, were summarised into a model based on Maslow's hierarchy of needs (Figure 2).

Topic of Interest

Participants identified 13 important topics for the SRH intervention using the NGT. All 18 participants agreed on the listed topics. A voting survey was distributed through Google Forms, featuring a five-point Likert scale for the 13 items. The total scores for each topic ranged from 18 to 90, reflecting the minimum and maximum possible scores. Table 2 displays the suggested topics, and the recorded scores fell within the expected range, indicating consistent responses from participants. All 13 topics reached an agreement among the participants for inclusion in the SRH intervention. A final consistency check was conducted, and participants agreed on the SRH-related topics, with no unnecessary topics identified for removal.

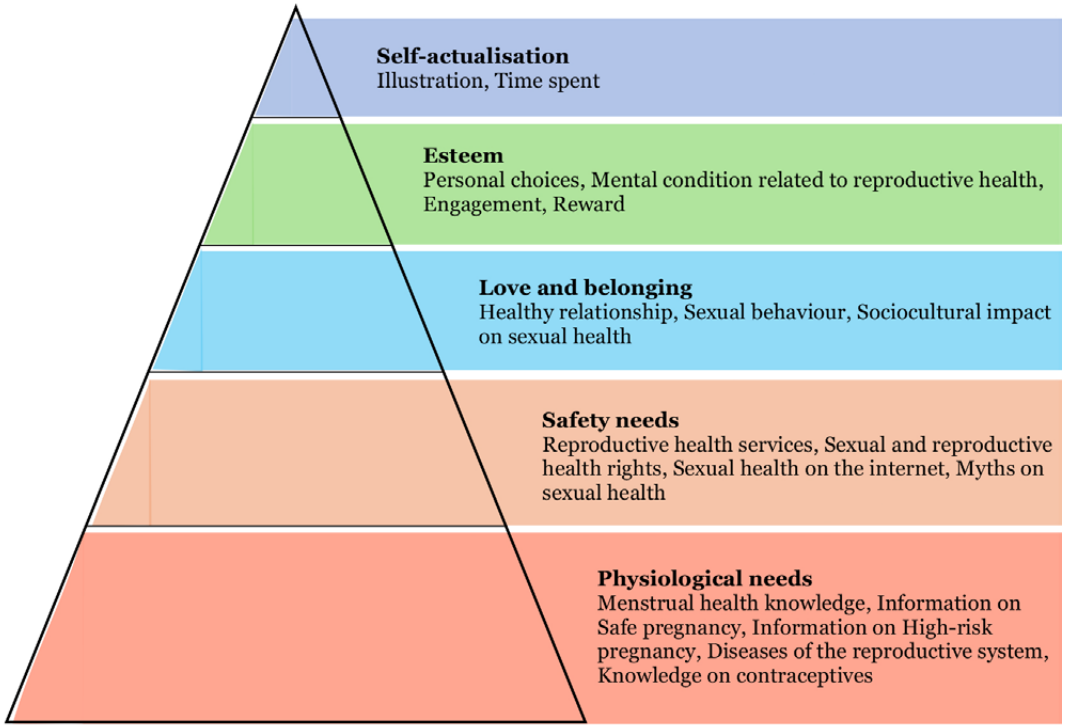


Figure 2. Conceptual framework of the sexual and reproductive health information needs of FELDA youth.

Table 2. Scores for topics of interest to FELDA youth for inclusion in an SRH intervention.

Suggested topics	Points																		Total scores
	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Y12	Y13	Y14	Y15	Y16	Y17	Y18	
Mental health and sexuality	5	5	5	5	5	5	3	5	5	5	5	5	5	5	5	5	5	5	88
Reproductive system diseases and sexually transmitted diseases	4	4	5	5	5	5	5	4	5	5	5	5	5	5	5	5	5	5	87
Current issues and their prevention	5	5	5	3	5	5	5	4	5	5	5	5	5	5	5	5	5	5	87
Sexual harassment and unintended pregnancy	4	5	4	5	4	5	5	3	5	5	5	5	5	5	4	5	5	5	84
Challenges of the digital generation related to SRH needs	5	5	5	4	5	4	4	3	5	5	4	4	5	5	5	4	4	4	80
Access to SRH services	5	3	4	4	4	4	5	4	5	5	5	5	4	4	4	5	5	5	80
Menstrual health management	3	5	3	3	5	5	3	5	5	5	5	4	5	5	5	5	4	5	80
Understanding and compatibility in relationships	3	4	3	5	4	3	5	4	5	5	5	5	4	5	5	4	4	4	79

(*continued on next page*)

Table 2. (*continued*)

Suggested topics	Points																		
	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Y12	Y13	Y14	Y15	Y16	Y17	Y18	Total scores
Cultural norms and their impact on sexual behaviour	4	3	5	4	3	4	3	5	5	5	5	5	5	4	5	3	5	5	78
Pregnancy choices and reproductive rights	3	3	3	5	4	4	3	5	5	5	5	4	4	5	5	5	5	5	78
Reproductive and sexual health rights	4	3	3	4	3	3	4	5	5	5	5	5	5	5	3	5	5	4	76
Sexual health myths and facts	4	4	4	3	3	3	4	3	5	5	5	5	5	4	5	3	5	5	75
Empower healthy SRH practices among youth	4	4	4	3	3	3	4	3	5	5	5	5	3	5	5	3	5	3	72

Y1 = first participant; Y2 = second participant, and so on. SRH = sexual and reproductive health.

Discussion

Participants were predominantly young Malay undergraduates from rural areas, who were actively involved in youth initiatives but had limited exposure to health programmes and restricted access to reliable information. The predominance of female participants aligns with earlier findings on women's higher community participation. These demographics highlight the need for inclusive, culturally sensitive SRH interventions and strong communication skills shaped by informational, parental, and contextual factors (28).

FELDA youth have a distinct sociocultural context in terms of their SRH information needs, indicating that culturally sensitive and context-specific educational initiatives are required to address their SRH knowledge and behaviours. Five themes were generated based on Maslow's hierarchy of needs: i) physiological needs; ii) safety needs; iii) love and belonging; iv) esteem; and v) self-actualisation.

Participants were interested in learning more about contraception, high-risk pregnancy cases, and male and female reproductive disorders. They also expressed concerns about receiving false information. Persistent misinformation shaped by sociocultural norms, such as misconceptions about pregnancy following first intercourse or contraceptive pill use, heightens youths' vulnerability to unintended pregnancy and sexually transmitted infections, adversely affecting their overall health outcomes and long-term well-being (29, 30).

Participants demonstrated limited awareness of the preventive role of HPV vaccination. Persistent stigma surrounding sexuality discouraged open dialogue despite participants recognising its importance. These findings underscore the need for comprehensive, age-appropriate SRH education to reduce cultural barriers and promote informed youth engagement (31). Physiological needs are the most basic needs and are located at the bottom of the conceptual framework.

Cultural and familial norms hinder open communication about sexuality, making youth feel uneasy, reinforcing perceived inappropriateness, and perpetuating stigma that restricts access to accurate information and sustains cycles of misinformation (32). To address these barriers, strategies are needed to normalise discussions about SRH. This goal can be achieved through educational approaches that respect cultural differences and foster communication between generations (33). Additionally, the limited understanding of the link between reproductive and mental health points to a disjointed view of well-being. This finding highlights the need to include emotional and psychological aspects in SRH education (34).

Participants provided valuable input on healthy relationships, and recognised the importance of emotional well-being and responsible sexual behaviour. However, existing

gaps in understanding aspects such as mutual respect, trust, communication, and consent still need to be addressed. These findings highlight the need for relationship education that promotes emotional intelligence, gender equity, shared responsibility, and the use of the internet to seek SRH information (35), coupled with concerns about misinformation and exposure to inappropriate content (36), as well as youth-friendly digital resources and improved digital health literacy among young adults (37).

SRH information on social media may increase risky behaviours because it is a widely accessed platform; however, it also supports the dissemination of reliable content on SRH information, thereby promoting awareness, inclusivity, and responsible decision-making among middle-aged youth (38). Social media provides an accessible platform for youth-oriented SRH initiatives that enhance understanding, critical awareness, and positive behaviour change outcomes (39).

The triangulation of the results from the FGD and NGT was an effective method. It showed that the FGD indirectly supported the NGT session. This methodological triangulation was used to enhance the reliability and validity of the research findings. The credibility of the research findings was strengthened, and method bias was reduced, making the research conclusions more robust (40).

Participants preferred interactive, visually engaging digital SRH interventions, including self-directed e-books or webpages with infographics, concise text, and gamified elements such as quizzes, rewards, and badges. Time indicators and mobile-friendly designs were valued, suggesting that such tools can effectively enhance SRH knowledge, motivation, and youth engagement (41). Overall, the findings underscore the importance of providing accessible, accurate, and culturally sensitive SRH education to support informed decision-making and promote young people's well-being (42, 43). Self-actualisation remains essential for addressing the SRH information needs of FELDA youth.

Limitation

The qualitative design, group dynamics, and facilitator influence limit generalisability. Future theory-informed research and expert input could strengthen SRH intervention development. Further work should address contextual barriers to youth engagement effectively.

Conclusion

This study provides insights into the SRH information needs of FELDA youth. Despite their engagement in development initiatives, their SRH knowledge remains limited, particularly regarding contraception, reproductive disorders, mental health, and healthy relationships. Cultural taboos continue to hinder open discussion and access to credible information. Youth preferred self-paced, visual, and interactive digital resources tailored to their context. Integrating formal and informal platforms may enhance SRH literacy and support informed decision-making.

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Ethics of Study

This study complies with the ethical standards for conducting research involving human subjects as set by the Research Ethics Committee at Universiti Kebangsaan Malaysia, and was approved on 13 February 2025 (approval no: JEP-2024-939). This study was also registered with the National Medical Research Register at the Ministry of Health Malaysia (NMRR ID-24-03784-TBG). The Research Ethics Committee at Universiti Kebangsaan Malaysia approved our guide for interviews, and all respondents gave written consent for review and signature before starting interviews. All participants were informed about the purpose of the study and the intended publication of anonymised data. Written informed consent for publication of anonymised quotations and findings derived from the focus group discussions was obtained from all participants before data collection. All participant information was kept strictly confidential. Data were anonymised and stored securely in accordance with institutional and national data-protection guidelines. The anonymised data generated and analysed during the current study are available from the corresponding author on reasonable request.

Conflict of Interest

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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Authors' Contributions

Conception and design: NHMH
Analysis and interpretation of the data: NHMH, RS, ZMI
Drafting of the article: NHMH
Critical revision of the article for important intellectual content: RS, ZMI, NAM, NA, NEM
Final approval of the article: RS, ZMI, NAM, NA, NEM
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