

Original Research

Barriers to Adolescent Health Service Delivery in Pekanbaru: A Qualitative Study Stakeholder Perspectives

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ABSTRACT

Introduction: Adolescent health services are expected to meet the needs of adolescents in maintaining their health and preventing risky behaviors. However, in reality, many adolescents still have unhealthy lifestyles, such as high sugar consumption, low physical activity, and increasing cases of teenage pregnancy.

Objective: This study aimed to explore the barriers to adolescent health service delivery in Pekanbaru, Indonesia.

Method: This study used a qualitative design, with data collected through focus group discussions. Participants were selected using purposive sampling, and a total of eight participants were involved, including representatives from the National Population and Family Planning Agency of Riau Province, the Pekanbaru City Health Office, heads of community health centers, coordinators of School Health Programs and Youth Care Health Services at community health centers, health cadres, and academics. Data analysis was conducted using the Colaizzi method, and the coding process was supported by Open Code software version 4.03.

Results: The findings identified four main themes: (1) adolescent health problems and risky sexual behavior, (2) limited coverage of adolescent health services, (3) reliance on community cadres, and (4) barriers to school-health service collaboration.

Conclusion: Adolescent health services cannot rely solely on community health centers but require cross-sectoral collaboration, especially with schools, where adolescents spend most of their time. Strengthening program integration and collaboration across sectors is essential to improve adolescent health service delivery.

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INTRODUCTION

Data from the Central Statistics Agency (BPS) states that teenagers adolescents (10-19 years) constitute almost 30% of the population in Indonesia (1). Teenagers (Adolescents) are a group of people who are vulnerable to problems and have the potential to develop the country. The problems that many adolescents face today are related to mental health and emotional development (2,3), reproductive health problems which include low teenage literacy (4) resulting in teenage pregnancies (5) and the incidence of HIV in adolescents (6), nutritional problems starting from anemia (6), undernutrition, to overnutrition or obesity. Adolescents with a good understanding of health can maintain their physical (7) and mental health so that they have cognitive abilities and skills that are able to compete globally.

In the current 5.0 era, teenagers can easily access information, but many of them do not yet have the correct skills in surfing cyberspace (8). Many teenagers just follow along and don't use the internet to learn positive things. The existence of trends and demands to look good on social media causes teenagers to stress and lose their identity, this has an impact on mental health problems (9) which also interfere with their learning activities at school. Not to mention the social environment in cyberspace, which can lead teenagers to become victims and perpetrators of harassment and sexual assault. This results in teenage pregnancies and without the support of others, they can progress to depression and ultimately suicide (10). The inability of families and health services to identify adolescent health problems from the start makes these problems more difficult to treat. Adolescents have increasing access to digital information and communication technologies, creating new opportunities to obtain health information. However, access to information does not necessarily translate into adequate health literacy, and adolescents may still encounter misinformation, online risks, and challenges related to mental health, reproductive health, and healthy lifestyle behaviors (8,9). These complex health needs require timely identification and appropriate support from families, schools, and health services. Delayed recognition and limited access to responsive health services may reduce opportunities for early prevention and intervention, potentially leading to poorer health outcomes (10).

The problem of identifying adolescent health problems is not only experienced in Indonesia, but also in other countries. The United Kingdom or United Kingdom experienced the same problem and carried out a transformation by integrating the entire health care system with community partnership services such as volunteers and law-based mental health services to provide services that focus on early intervention and prevention of adolescent mental health problems (11). In contrast to Indonesia and the UK, China has had a success story in improving the health status of adolescents through strengthening the economy and integrating health services with legal entities and national development planning bodies so that it has an adolescent health database (12). International evidence suggests that strengthening adolescent health services requires coordinated and multisectoral approaches rather than health-sector interventions alone. In the United Kingdom, service innovations have emphasized early intervention and collaboration between mental health services and community partners to improve access and continuity of care for children and adolescents (11). Similarly, experiences from China highlight the importance of integrating adolescent health into broader national development and health-system strategies to improve adolescent health and well-being (12). Although these experiences demonstrate the value of coordinated service delivery,

evidence on how such approaches are implemented and the barriers encountered within Indonesian primary healthcare and school settings remains limited.

The Ministry of Health of the Republic of Indonesia prioritizes adolescent nutrition as a national program by providing blood supplement tablets to adolescent girls so that it can break the chain of stunting incidents (13). Efforts to maintain and improve adolescent health have been promoted since 2003 at community health centers through PKPR (Youth Care Health Services) services for adolescents in the community and UKS (School Health Services) services for adolescents in the school environment. Apart from community health centers, another agency that plays a role in maintaining and improving adolescent health is BKKBN (National Population and Family Planning Agency) with educational activities through the Genre Forum (Generation Planning). The Indonesian government has implemented several adolescent health programs across different sectors. The Ministry of Health delivers adolescent-friendly health services through Youth Care Health Services (PKPR) in primary healthcare centers and School Health Services (UKS) in educational settings, while community-based initiatives such as Posyandu Remaja aim to improve adolescents' health promotion and preventive care (13). In parallel, the National Population and Family Planning Agency (BKKBN) implement programs including the Generation Planning (GenRe) Program, Youth Information and Counseling Centers (PIK-R), and Family Development for Adolescents (BKR), which focus on reproductive health education, peer counseling, and parental support for adolescents. Although these programs share the common goal of improving adolescent health and well-being, they are implemented by different sectors with distinct target populations and operational mechanisms. This fragmented service structure may limit coordination, continuity of care, and access to comprehensive adolescent health services, particularly at the primary healthcare and school levels. However, evidence regarding how stakeholders perceive these implementation barriers remains limited.

Promotive and preventive efforts carried out in adolescent health services include Healthy Living Skills Education (PKHS), adolescent reproductive health, mental health and prevention and substance abuse, physical activity, prevention of Non-Communicable Diseases (NCDs) and prevention of violence in adolescents (14). Ideally, youth posyandu services are able to cover almost all of the physical and psychological health needs of teenagers, however this service has not run optimally due to the minimal involvement of teenagers in youth posyandu (13). Apart from that, learning activities at school and the sedentary lifestyle of teenagers are the main factors in not running youth posyandu. Teenagers spend more time at school and play gadgets a lot at home.

The implementation of adolescent health activities in Riau Province through PKPR community health centers only reached 61%, there are even districts/cities that do not organize adolescent health activities (15). Based on a preliminary study conducted regarding the existence of youth posyandu in Pekanbaru City, only 1 community health center has a youth posyandu out of 21 existing community health centers. UKS and PKPR health center officers find it difficult to interact with teenagers due to busy school activity schedules and low levels of youth participation in activities in the community. The Community Health Center has an adolescent health screening tool, ongoing screening, namely nutritional status, which is carried out in the new school year, however screening related to development and mental health problems of adolescents cannot yet be carried

out due to limited interaction time with adolescents, so adolescent health data is still limited. Based on these conditions, it is necessary to carry out further exploration to find out how adolescent health services are implemented in the Pekanbaru wetlands area. Adolescent health services in Riau Province remain suboptimal. In 2023, only 61% of community health centers implemented Youth Care Health Services (PKPR), and several districts had not yet established adolescent health programs (15). A preliminary assessment conducted by the research team in collaboration with the Pekanbaru City Health Office further indicated limited availability of community-based adolescent health services, with only one of the 21 community health centers operating a Posyandu Remaja. Discussions with health providers also suggested challenges in reaching adolescents because of school schedules, limited participation in community activities, and restricted opportunities to conduct comprehensive health screening beyond routine nutritional assessments. These conditions highlight the need to explore stakeholders' perspectives on barriers to adolescent health service delivery in Pekanbaru.

METHOD

Research Type

This study used a qualitative approach with a case study design. It focused on adolescent health programs and the challenges encountered in their implementation within the working area of a community health center. This study employed a qualitative descriptive design to explore stakeholders' perspectives on barriers to adolescent health service delivery in Pekanbaru, Indonesia. The study focused on the implementation of adolescent health programs across primary healthcare and related community-based services, as perceived by key stakeholders involved in adolescent health planning, management, and service delivery.

Informants

Participants were selected using a purposive sampling technique based on the following criteria: involvement in adolescent health improvement efforts in Pekanbaru and willingness to participate in the study. The participants represented diverse stakeholders, including family planning officials, local health authorities, community health center managers, coordinators of school-based and youth-friendly health programs, academics with expertise in adolescent health, and community health cadres. A total of eight participants were included in this study. The adequacy of the sample size was determined based on the principle of information power. The focused research aimed and the participants' direct involvement in adolescent health program planning, management, and implementation provided rich and relevant information for addressing the research objectives. The diversity of stakeholder perspectives across different levels of adolescent health service delivery was considered sufficient to develop an in-depth understanding of barriers within the study context.

Potential participants were identified through relevant health institutions and approached by the research team through formal invitations. The invitation described the study objectives, procedures, confidentiality, and voluntary nature of participation. Written informed consent was obtained before data collection. No invited participants refused participation or withdrew from the study. The researchers maintained reflexivity throughout data collection and analysis, considering any existing professional relationships with participants. No financial incentives were provided; however,

transportation costs for attending the FGD were reimbursed in accordance with the approved research protocol.

Research Location

The study was conducted in Sri Meranti Village, Rumbai District, Pekanbaru City, which is characterized as a wetland area. The study was conducted in Sri Meranti Village, Rumbai District, Pekanbaru City, Indonesia. This area was selected as the study setting due to its characteristics as a wetland community and the implementation of adolescent health programs within the local primary healthcare context. Although data collection was centered on this community setting, participants included stakeholders involved in adolescent health programs at both local and city levels in Pekanbaru.

Instrumentation or Tools

The qualitative data were obtained through Focus Group Discussion (FGD) recorded and transcribed verbatim. Video cameras, sound recordings, and field notes were used as a form of validation of data obtained from the FGD. The FGD process was carried out using an FGD guide that had been prepared previously so that the discussion topics were in line with the research objectives. The moderators and facilitators of the FGD are researchers themselves who already have experience in conducting qualitative research using data collection methods using FGD. Qualitative data were collected through a focus group discussion (FGD), which was audio- and video-recorded with participants' permission and transcribed verbatim. Field notes were used to document contextual observations and non-verbal interactions during the discussion, complementing the interview transcript during analysis. The discussion was guided by a semi-structured FGD guide developed according to the study objectives. The FGD was moderated and facilitated by two female nursing lecturers holding master's degrees in nursing, who had prior training and experience in qualitative research and FGD facilitation. Although the researchers had previous professional collaborations with the community health center leader and community health cadres, most participants had no prior relationship with the research team. To enhance reflexivity, the researchers regularly discussed how their professional backgrounds and assumptions might influence data collection and interpretation throughout the study.

Data Collection Procedures

Data collection was conducted from May to July 2024. Prior to participation, all participants were provided with an informed consent form. A focus group discussion (FGD) was held at the researcher's institutional office and lasted approximately 84 minutes. The discussion was guided by a semi-structured interview guide and audio-recorded with participants' permission. The mixed-stakeholder FGD was intentionally designed to facilitate dialogue across different levels of adolescent health service planning and implementation. To minimize potential power asymmetry, the facilitators established ground rules at the beginning of the discussion, emphasizing confidentiality, mutual respect, and the equal value of all participants' perspectives. Participants were encouraged to express their views freely, and the facilitators actively invited quieter participants to contribute to ensure balanced participation.

To ensure the trustworthiness of the data, several strategies were applied. Credibility was established through member checking, by returning the findings to participants for confirmation. Dependability was supported by maintaining detailed documentation of the

research process, including interview procedures and field notes. Confirmability was ensured by minimizing researcher bias through careful data interpretation and maintaining an audit trail. Transferability was addressed by providing a clear description of the research context and participant characteristics. Trustworthiness was enhanced through multiple strategies. At the end of the FGD, the facilitators summarized the main discussion points and invited participants to confirm or clarify the accuracy of the interpretation (on-the-spot member checking). Following transcription and preliminary analysis, each participant also received a summary of the FGD findings for further confirmation and feedback. Feedback from participants was incorporated where clarification was required. An audit trail documenting recruitment procedures, field notes, transcription, coding decisions, and theme development was maintained throughout the study. Reflexivity was supported through regular discussions among the research team regarding methodological decisions and interpretation of the findings. Field notes were used alongside the transcript to capture contextual information and group interactions that informed data interpretation. Detailed descriptions of the study setting and participant characteristics were provided to support readers in assessing the transferability of the findings.

Data Analysis

Data analysis was conducted after the audio recordings were transcribed verbatim and checked against video recordings and field notes to ensure accuracy. The data were analysed using an inductive thematic approach. The analytic procedures were informed by Creswell's qualitative data analysis process, beginning with repeated reading of the transcripts to gain familiarity with the data, followed by coding, grouping similar codes into categories, and developing themes that represented participants' perspectives. The findings were then integrated into a comprehensive description of the phenomenon, and the results were returned to participants for validation. The data were managed using Open Code software to assist in coding, organizing categories, and developing themes. Coding was conducted collaboratively by two members of the research team using Open Code version 4.03. Throughout the analysis, coding decisions and emerging themes were discussed until consensus was reached. The relationships among codes, categories, and themes were reviewed iteratively to ensure that the final themes accurately reflected participants' perspectives and addressed the study objectives.

Ethical Approval

Ethical approval was obtained from the Nursing and Health Research Ethics Committee at the Faculty of Nursing, Universitas Riau (Approval No. 961/UN19.5.1.8/KEPK.FKp/2024) before data collection commenced. In addition, each participant in this research has been asked for their consent to be involved in the research by filling out and signing an informed consent form. All participants provided written informed consent before participation. Participants were informed that, while the research team would maintain data confidentiality, complete confidentiality among FGD participants could not be guaranteed due to the group discussion format. They were therefore asked to keep the discussion confidential and not disclose other participants' statements. Audio recordings and de-identified transcripts were stored in password-protected files accessible only to the research team. Participants were assigned identification codes and quotations were reviewed to minimize the risk of deductive disclosure.

RESULTS

Eight female stakeholders participated in the study. Participants had between 4 and 16 years of experience in adolescent health services. Their educational backgrounds included diploma, bachelor's, master's, and senior high school qualifications. All participants spoke Indonesian as their first language. Table 1 presents the participants' characteristics.

Most participants highlighted that adolescent health problems require attention from multiple stakeholders. Four key themes emerged: (1) implementation barriers to preventive adolescent health services, (2) fragmented adolescent health program implementation and limited services reach, (3) reliance on community cadres, and (4) barriers to school-health service collaboration. Participants also noted that health services heavily rely on health cadres and face challenges in collaborating with schools.

Table 1. Socio-demographic characteristics of the participants

Code	Institution/position	Level education	Years of experiences
S1	Primary healthcare	Bachelor	12
S2	Local government	Diploma	16
	Local government		
S3		Diploma	6
S4	Family planning agency	Master	4
S5	Primary healthcare	Bachelor	15
S6	Community	Senior high school	10
S7	Community	Senior high school	8
S8	Community	Senior high school	6

Source: Primary Data

Theme 1: Implementation Barriers to Preventive Adolescent Health Services

The primary adolescent health issues that are of concern are related to reproductive health, particularly anemia. Prevention of anemia in adolescents is addressed through the administration of iron supplement tablets. However, the government's program to provide these tablets through community health centers has not effectively reached its intended target. Participants perceived that the main challenge was not the availability of iron tablets, but ensuring adolescents' adherence after distribution. Although iron tablets were supplied through schools and supported by collaboration between the health and education sectors, participants reported difficulties in achieving consistent consumption. Variations in school implementation, limited monitoring, and low adolescent engagement reduced the effectiveness of the programme.

"From the Health Department, the data is the same, the iron supplement tablets achievement is the lowest.... the tablets are already available, and teenagers also already have them, now what remains is how to get the existing goods to be taken by teenagers...(S2)

"We have also used the route, we also have an MoU with the education department from the health service, ...but we are still facing teenagers who don't want to take the iron supplement tablets" (S2)

Participants described several strategies that had been introduced to improve adherence, including supervised tablet consumption at schools and a mobile application for monitoring tablet intake. However, they reported that implementation varied across schools and that the application was not widely used, limiting its effectiveness.

"After the Friday activity (imtaq), in the field..., they were given iron supplement tablets. Well, every school's art is different" (S3)

"There is an application where teenagers can input their tablet consumption... but the data is still limited because not all of them use it." (S2)

Participants also perceived that adolescent health promotion had become increasingly challenging because adolescents were exposed to more complex health issues, including sexual content encountered through digital media. They believed that preventive services should respond to these changing needs through broader health education.

"...is this elementary school in grade 1 or grade 2 in elementary school? Watching what movie? Blue films" (S2)

Theme 2: Fragmented Adolescent Health Program Implementation and Limited Services Reach

Currently, adolescent health services include youth family programs, the Youth Information and Counseling Center (PIK-R: Pusat Informasi dan Konseling Remaja), the Planning Generation (Gen-Re: Genereasi Berencana), Youth Family Development (BKR: Bina Keluarga Remaja) programs, and initiative run by intern students in community settings. Participants described adolescent health services as being delivered through multiple programmes, including PIK-R, Gen-Re, BKR, youth family programmes, and community-based initiatives. However, the presence of multiple programmes did not necessarily translate into broad and sustained adolescent coverage. Participants perceived that fragmented programme responsibilities, varying implementation across settings, and limited continuity of activities contributed to gaps in reaching adolescents.

"In BKKBN, there are programs like BKR for parents and PIK-R for adolescents... in general, it is part of the Gen-Re program" (S3)

Apart from that, not all schools have a PIK-R program. The coverage of health outreach to adolescents by the Genre Program is also still limited so that not all adolescents are exposed to adolescent health education.

"...some of those schools, as far as I know, have nurses. But for the others, it's just the UKS teacher, right, and the UKS room...(S4)

"We have a UKS, ma'am, but there aren't any nurses..." (S1)

Health education activities conducted by community health centers are often not continuous due to time constraints in schools. Education or counseling for teenagers in schools carried out by Community Health Centers is often difficult to adjust to the timing of student learning activities. This makes counseling unsustainable. The adolescent health screening process only involves measuring general data and administering iron supplement tablets and we hope that UKS can continue to monitor students' health further.

"So that's why, even if it's like the community health centers (puskesmas) comes to the school, there's a lot of counseling, it's all kinds of things, just until that day, not that day, just at that time. When it's finished, it's finished, there's no continuity" (S2)

In the community setting, adolescent health services are still minimal, and youth posyandu is not widely available.

"If it's a youth posyandu, you could say, you don't know about it, it doesn't exist (S1)

Theme 3: Reliance on Community Cadres

Adolescent health services in schools are supported by UKS facilities, although UKS nurses are often school teachers who take on this role. In the community, adolescent health services rely heavily on community cadres, who are also responsible for many other programs. Despite the availability of a data collection application, cadres are still expected to collect and input data into adolescent health program applications. Cadres frequently face challenges in fulfilling their duties due to the large volume of application data required from various sectors, which depends on posyandu data. Adolescent health services at the community level were perceived to rely substantially on community cadres, who also supported multiple health programmes beyond adolescent services. Across the three cadre participants, workload emerged as a common challenge, although experiences differed depending on their involvement in other programmes and administrative responsibilities. Cadres reported that additional tasks, including data collection and reporting through multiple digital applications, increased their administrative burden. These concerns were also acknowledged by managerial stakeholders, who described cadres as essential but facing competing responsibilities that could affect the continuity of adolescent health activities.

"One cadre handles many roles... even with the same problem and the applications are different, the reporting is different. The amount can vary (S2)

Beyond workload, participants identified limited operational support, delayed incentives, and the need for continuous training as factors affecting cadre retention and programme

sustainability. Rather than being isolated challenges, these issues reflected broader workforce governance constraints in maintaining a reliable community-based workforce for adolescent health services.

"The workload is no longer suitable" (S3)

Participants reported that community activities received only small operational support from local government funding mechanisms (approximately IDR 100,000 per payment period), provided every six months.

"The current budget for the regional budget from the sub-district head is 100 thousand, sometimes not even that 100 thousand, no, this continues to be paid every 6 months" (S5)

"The support provided through the local budget mechanism is only around IDR 100,000, and sometimes even less. This support is provided every six months." (S5)

Efforts to regenerate cadres often face challenges because only a few are interested in becoming cadres, especially youth cadres. Some existing youth cadres often face difficulties in regeneration due to the mobility of teenagers who graduate from school, continue their studies outside the city, work and so on. Cadres are the central point in the implementation of health service activities.

Theme 4: Barriers to School-Health Service Collaboration

Collaboration with schools is essential but remains challenging. Schools prioritize academic activities, making it difficult to allocate time for health programs. Health-sector stakeholders perceived that integrating health activities into school routines remained challenging due to competing academic schedules and limited coordination mechanisms. Participants described school-based adolescent health activities as dependent on negotiation with schools and alignment with academic schedules. Health-sector stakeholders perceived that limited flexibility in school routines could affect the timing and continuity of counselling, screening, and other preventive activities.

"...a few years ago, there happened to be a lot of facilities and support for adolescent health, so we could be said to be free to go to school for counseling programs, especially for teenagers with problems at school. So that was the situation at that time, we asked the teachers for help... we can carry out counseling directly there..." (S4)

Participants perceived that schools placed strong emphasis on academic achievement, which could create challenges in allocating time for health-related activities.

"Because this school also has problems,... Meanwhile, we from the Ministry of Health have to come down, right? We have to net all school children and screen them. (S1)

"Well, we don't have enough energy, so even at school he is reluctant, which means he feels disturbed" (S4)

"... please circulate this questionnaire, run it, then we will just do this, analyze, what activity plans need to be carried out after that. So they feel it is important..." (S1)

The need for program and policy integration has been recognized by policymakers in primary health services. Participants perceived that collaboration between health services and schools remained challenging. Health-sector stakeholders described difficulties in integrating counselling, screening, and preventive activities into school routines due to competing academic schedules and limited coordination. Although previous collaborations had facilitated access to schools, sustaining these activities required ongoing negotiation and support from schools.

Beyond school-level coordination, participants also identified broader cross-sector governance challenges affecting adolescent health service delivery. Stakeholders perceived that coordination between relevant sectors remained fragmented, with limited information sharing and unclear distribution of roles.

"So, we are just the agencies, we haven't connected yet, that's it. Still alone (S2)

DISCUSSION

This study highlights several barriers in adolescent health service delivery, particularly related to coordination, service coverage, and cross-sector collaboration. Participants highlighted the need for improved coordination between health center agencies, schools, health services, and education services to enhance the effectiveness of the program. A major issue remains that teenagers are not interested in taking iron supplement tablets. This finding aligns with previous research, which noted low awareness among teenagers about the importance of consuming iron supplement tablets, with only a few being informed about their use (16). This study explored how adolescent health services are implemented from the perspectives of eight stakeholders involved in planning, managing, and delivering adolescent health services in Pekanbaru, Indonesia. Across the four themes, the findings indicate that the main barriers were not necessarily the absence of programmes or service inputs, but difficulties in translating existing programmes into continuous and coordinated services at the point of delivery. Iron supplement tablets were available through schools, several adolescent health programmes had been established, community cadres continued to support community activities, and health workers conducted school-based activities. However, these efforts were not consistently followed by sustained adolescent engagement, coordinated implementation, or adequate operational support. This finding is consistent with recent evidence from Indonesia showing that adolescent health programmes may be constrained by fragmented coordination, limited provider capacity, and inconsistent implementation despite the existence of national policies and programmes (33). The present study adds a local perspective by illustrating how these implementation gaps were experienced by

stakeholders through problems related to tablet adherence, uneven programme coverage, cadre workload, and school–health service coordination.

Research indicated that while 74% of female students received iron supplement tablets, only 11.4% consumed it regularly each week (17). Launched by the Indonesian government in 2014, this program aims to prevent and address anemia in adolescent girls, who are particularly vulnerable due to rapid growth, increased erythrocyte mass, and heightened iron requirements from menstruation-related blood loss (18). Additionally, schools have not fully supported this initiative. Ideally, the iron supplement tablets program should be implemented for girls aged 12-18 years through UKS at schools, with weekly intake days coordinated with the health center (17).

Preventive services: availability does not ensure effective implementation

The first theme showed that the availability of iron supplement tablets was not perceived as the main problem. Instead, participants emphasized the difficulty of ensuring that adolescents consumed the tablets consistently after distribution. This distinction is important because it indicates that the challenge has shifted from providing the intervention to maintaining adherence at the adolescent and school levels. Similar findings have been reported in studies of weekly iron and folic acid supplementation, where barriers to regular consumption include side effects, taste, forgetfulness, limited monitoring, and variation in programme implementation (34,35). In Indonesia, Hidayanty et al. also found that although adolescent girls received iron–folic acid supplements through schools, regular consumption remained limited. Teacher reminders, parental and peer support, and adolescents' understanding of the benefits of supplementation were among the factors supporting adherence (36).

These findings help explain the situation observed in Pekanbaru. The existence of a distribution mechanism and even a digital monitoring application does not necessarily ensure that adolescents will consistently consume the tablets. Participants reported that supervised consumption had been attempted and that a mobile application was available, but implementation varied between schools and application use remained limited. Therefore, the issue is not simply whether the programme exists, but whether there is sufficient follow-up at the point where adolescents are expected to change their behaviour. In this context, monitoring mechanisms should complement, rather than replace, direct communication and reinforcement by health workers, teachers, and families. This is consistent with the Indonesian evidence showing that social support and regular reminders can facilitate adherence to iron–folic acid supplementation (36).

The findings also indicate that preventive adolescent health services need to respond to health concerns that are broader than the original programme focus. Participants described adolescents as increasingly exposed to health information and risks through digital media, suggesting that health promotion cannot rely only on programme-specific activities such as iron supplementation. However, this does not mean that all adolescent health problems should be addressed through one programme. Rather, it highlights the need for primary healthcare services to identify the range of health needs among adolescents and determine appropriate follow-up according to those needs.

Fragmented programmes and limited continuity of services

The second theme demonstrated that adolescent health services were implemented through several programmes involving different sectors and institutions, including PKPR,

UKS, PIK-R, GenRe, BKR, and Posyandu Remaja. The presence of multiple programmes provides opportunities to reach adolescents through different settings, but the findings suggest that programme availability alone did not guarantee broad or continuous service coverage. Participants described differences in programme availability between schools and limited community-based adolescent services. They also reported that health education and screening activities conducted by community health centres were often limited to particular visits, with no mechanism to ensure continuity after the activity ended.

This finding reflects the broader problem of fragmentation in adolescent health services. Adolescent health needs often extend across health, education, family, and social environments, while programmes are commonly organised according to sector-specific responsibilities. Fazel and Soneson highlighted that structural misalignment between health, education, and social care can contribute to fragmented adolescent services and weaken the development of integrated care (37). Similar challenges have been reported in adolescent sexual and reproductive health services in other low- and middle-income settings, where multiple policies and responsible institutions do not necessarily result in consistent service coverage when coordination and accountability mechanisms are weak (38).

The findings from Pekanbaru suggest that fragmentation is experienced at the service-delivery level as discontinuity. When a community health centre visits a school, adolescents may receive counselling or screening, but participants described these activities as ending when the visit ended. Consequently, contact with the health system becomes an episodic activity rather than an ongoing process. This is important because adolescent health problems may require more than a single screening or educational session. Identification of a health problem should ideally be followed by appropriate counselling, referral, monitoring, or further care. Without a mechanism connecting these stages, the presence of screening or education activities may have limited impact on longer-term adolescent health.

The findings also suggest that fragmentation is not simply a problem of having too many programmes. The more important issue is the absence of clear coordination between programmes, including who is responsible for reaching adolescents, sharing information, following up identified problems, and maintaining contact after an activity has been completed. Therefore, integration should not necessarily mean merging all adolescent health programmes into one programme. Instead, clearer linkages between existing programmes and service providers may be more feasible within the current primary healthcare structure.

Reliance on community cadres and workforce sustainability

The third theme showed that community cadres play an important role in maintaining adolescent health activities at the community level. However, cadres are also involved in multiple other health programmes and administrative tasks. Participants described multiple reporting requirements, different applications, limited operational support, and the need for continuous training. These findings indicate that cadres function as an important extension of community-based health services, but their capacity is influenced by the broader organisation of the community health system.

This finding is consistent with evidence from Indonesia showing that community health workers and cadres frequently operate within a volunteer-based system in which financial and non-financial support can influence motivation and programme performance (39). Incentive and support mechanisms may improve short-term performance, but long-term reliance on volunteer labour also raises questions about sustainability when responsibilities continue to increase (39). The findings from Pekanbaru add another dimension to this issue: the burden experienced by cadres was not only related to the number of activities, but also to administrative requirements across programmes. When similar information has to be entered into different applications or reported through different systems, cadres may spend substantial time on administrative tasks that do not directly contribute to adolescent engagement.

The limited operational support reported by participants should therefore be interpreted within this broader workforce context. The issue is not simply whether cadres receive financial incentives, but whether the expectations placed on them are proportionate to the support, training, supervision, and resources available. UNICEF Indonesia also identified challenges related to the expanding responsibilities of community cadres and the need to strengthen support for community-based nutrition and health services (40). In the present study, cadre regeneration was another concern, particularly because adolescent cadres may leave the programme when they graduate, move, continue their education, or enter employment. This creates an additional challenge for maintaining continuity of adolescent health activities at the community level.

Thus, strengthening cadre involvement in adolescent health should not simply involve adding more tasks. A more sustainable approach would require clearer task allocation, coordination between programmes, regular supervision, appropriate training, and operational support. From a primary healthcare perspective, these mechanisms are important because the continuity of community-based adolescent services depends partly on the availability and sustainability of the workforce responsible for implementation.

School–health service collaboration as an implementation barrier

The fourth theme showed that school-based adolescent health activities were highly dependent on coordination with schools. Participants perceived that academic activities were prioritised within school routines, which made it difficult for health workers to obtain sufficient time for counselling, screening, and other preventive activities. Because most health workers were external to the school, access to students required repeated negotiation with teachers and school administrators.

The importance of school–health collaboration has been recognised internationally. WHO and UNESCO emphasise that effective school health requires collaboration between the education and health sectors rather than the responsibility of the health sector alone (26). School-based health services can also provide adolescents with more accessible opportunities to obtain preventive and curative care, particularly when health professionals are available within or closely linked to the school environment (22). However, the findings of this study indicate that such continuity is difficult to achieve when health workers only visit schools periodically.

The absence of nurses in the UKS setting described by participants is particularly relevant. Although UKS facilities were reported to exist, participants indicated that these

facilities did not necessarily have a nurse who could provide continuous health support. This creates a structural limitation because health workers from community health centres must repeatedly negotiate access to schools instead of providing care through a professional who is already embedded in the school environment. However, this finding should be interpreted as a perception of health-sector stakeholders, because school personnel and education-sector stakeholders were not included as participants. The study therefore cannot conclude that schools are unwilling to collaborate; rather, the findings indicate that the current organisational arrangement makes collaboration dependent on negotiation and available time.

The finding is consistent with the broader literature showing that school health programmes require clear institutional arrangements between health and education sectors (26,27). Evidence from Indonesia also suggests that implementation of health-promoting school components varies between schools and depends on local capacity and coordination (28). Therefore, strengthening school-based adolescent health services may require more than increasing the frequency of visits from community health centres. Establishing clearer roles, schedules, referral mechanisms, and coordination between schools and primary healthcare services may provide a more sustainable basis for implementation.

Interconnection between the four themes

When considered together, the four themes indicate that the identified barriers are interconnected rather than independent. Preventive interventions such as iron supplementation may be available, but adherence remains difficult to maintain (Theme 1). At the same time, adolescent health programmes are implemented through multiple sectors and settings, resulting in uneven coverage and limited continuity (Theme 2). Community-based implementation relies heavily on cadres who face increasing workload and limited operational support (Theme 3), while school-based services depend on access and cooperation that must be negotiated with schools (Theme 4).

These conditions can reinforce one another. Fragmented programme responsibilities may make it difficult to determine which actor is responsible for follow-up. Limited cadre capacity reduces the ability to sustain community-based activities, while limited access to schools restricts opportunities for health workers to maintain regular contact with adolescents. As a result, adolescents may receive individual health interventions without being connected to a continuous pathway of care.

This pattern suggests that the main issue identified in this study is not a lack of adolescent health programmes, but a weakness in the coordination mechanisms that connect existing programmes, workers, and service settings. International experience also indicates that improving adolescent health services requires coordination across sectors and levels of care rather than relying on individual programmes alone [33,37,38]. A qualitative evaluation of child and adolescent mental health service transformation in the United Kingdom, for example, found that implementation depended not only on national policy but also on local understanding, collaboration, and organisational capacity [41]. This supports the interpretation that policy availability does not automatically produce consistent implementation at the local level.

For Pekanbaru, strengthening coordination may therefore be more feasible than introducing additional programmes. Existing programmes such as PKPR, UKS, PIK-R, GenRe, BKR, and Posyandu Remaja already provide different entry points for adolescent health promotion and prevention. The challenge is to establish clearer linkages among these entry points, including mechanisms for identifying adolescents who need further support, referring them to appropriate services, and ensuring follow-up. Such an approach may help reduce duplication while improving continuity of adolescent health services.

Limitations and Cautions

This study has several limitations. First, the number of participants was limited, which may not fully represent all perspectives related to adolescent health services. Second, the study was conducted in one city (Pekanbaru), so the findings may not be generalizable to other regions with different contexts. Third, data were collected through focus group discussions, which may be influenced by group dynamics and could limit the expression of individual opinions. In addition, this study did not include direct perspectives from adolescents, who are the main target of the services. The identified barriers may be influenced by local policy, institutional context, and resource availability, which may differ across settings. This study has several limitations. The findings were based on a single mixed-stakeholder FGD within one local context, which may limit the diversity of perspectives and introduce potential social desirability or institutional-position bias despite efforts to facilitate open discussion and confidentiality. The study did not include adolescents, parents, school personnel, or education authorities, and findings were not triangulated with observations or document analysis. In addition, translation from Indonesian to English may have affected contextual meanings. Future studies involving multiple sites, diverse stakeholders, and complementary methods are recommended.

Recommendations for Future Research

Future studies should include adolescents' perspectives, including those in and out of school, as well as other relevant stakeholders such as parents, teachers, and education officials. Studies using multiple sites and complementary methods, including interviews, observations, and document analysis, are recommended to enable triangulation across service user, delivery, and governance perspectives.

CONCLUSION

Adolescent health service delivery in Pekanbaru is constrained by limited services coverage, dependence on overburdened community cadres, and weak integration between health centers and schools. Strengthening school–health center collaboration, clarifying cross-sector roles, and developing technical guidance for adolescent health programs are essential to improve service continuity and reach. Stakeholders participating in this study perceived that adolescent health service delivery in the Sri Meranti/Pekanbaru setting was constrained by limited services coverage, reliance on community cadres, and challenges in school–health center collaboration. Strengthening coordination across sectors, clarifying stakeholder roles, and developing practical guidance for adolescent health programs may support more sustainable service delivery.

AUTHOR'S CONTRIBUTION STATEMENT

N.R.T. contributed to the study conception and design, data collection, data analysis, interpretation of findings, and manuscript drafting. M.M.T. contributed to the study design, interpretation of findings, and critical revision of the manuscript. N.Y.S.

contributed to the study design, interpretation of findings, supervision of the research process, and critical revision of the manuscript. All authors reviewed and approved the final version of the manuscript for publication.

CONFLICTS OF INTEREST

The authors declare that there are no conflicts of interest that could have influenced the objectivity of this study.

DECLARATION OF GENERATIVE AI AND AI-ASSISTED TECHNOLOGIES IN THE WRITING PROCESS

The authors used ChatGPT (OpenAI) to assist with grammar and language refinement during the writing process. The authors take full responsibility for the content of the manuscript.

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