Caring: Indonesian Journal of Nursing Science
Article homepage: https://talenta.usu.ac.id/IJNS

Adolescent Barriers to Understanding Cancer Information: A Qualitative Study

Dina Rasmita*, Dewi Elizadiani Suza, Dwi Karina Ariadni
Faculty of Nursing, Universitas Sumatera Utara, Medan, Indonesia

Corresponding author: dinarasmita@usu.ac.id

ARTICLE INFO

Article history:
Received 30 May 2026
Revised 15 July 2026
Accepted 31 July 2026
Available online
https://talenta.usu.ac.id/IJNS

E-ISSN: 2685-7162

How to cite: Rasmita, D., Suza, D.E., Ariadni, D.K. (2026). Adolescent barriers to understanding cancer information: A qualitative study. *Caring: Indonesian Journal of Nursing Science*, 8(1). 198-210.

ABSTRACT

Cancer-related information is widely accessible to adolescents through schools, families, social media, and their surrounding environment. However, adequate understanding has not been produced by increased access to information. In this study, adolescents' experiences of the barriers that are encountered in the accessing and understanding of cancer-related information were aimed to be explored. A qualitative study with a descriptive phenomenological approach was conducted. Eighteen Grade XII students from SMK Negeri 14 Medan were purposively selected and were participated in semi-structured interviews. The data were analysed manually using Colaizzi's phenomenological method. Three main themes were identified by the analysis: (1) difficulty in the understanding of complex and diverse cancer information; (2) difficulty in the filtering and prioritising of large volumes of cancer information; and (3) difficulty in the coping with uncertainty before an adequate understanding of cancer was developed. These barriers were associated with fragmented and limited information, unfamiliar medical terminology, communication that was not tailored to adolescents' level of understanding, the broad scope of cancer-related topics, challenges in the prioritising of information, confusion in the distinguishing between symptoms, prevention, and treatment, and the perception of cancer as an inevitable death sentence. It is suggested by the findings that cancer information for adolescents should be communicated using clear, age-appropriate language, be presented progressively, be tailored to their lived experiences, be delivered by trusted sources, and be designed with consideration for adolescents' psychological needs. Valuable insights for the development of school-based cancer education programmes and adolescent-centred nursing interventions are provided by these findings.

Keywords: Cancer, Health literacy, Health information, Teenagers

https://doi.org/10.32734/ijns.v8i1.25785

1. Introduction

Cancer is a major global health challenge, whose incidence is continuing to rise and by which attention across all stages of life is required. In 2022, an estimated 20 million new cancer cases were diagnosed worldwide, and this number is projected to be increased further over the coming decade (Bray et al., 2024). Although cancer is more commonly associated with adulthood, many cancer-related risk behaviours are begun to be developed during adolescence. During this critical developmental stage, lifestyle behaviours, including dietary habits, physical activity, tobacco exposure, and healthcare practices, are become established and are often persisted into adulthood (Mytton et al., 2024; Parada et al., 2025). Therefore, health information that is not only accessible but also understandable, relevant, and applicable to their daily lives is needed by adolescents. The investment in adolescent health is essential, so that the health and well-being of future generations are improved (WHO, 2024).

Why exposure to health information does not always result in meaningful understanding is helped to be explained by health literacy. It is extended beyond simply being familiar with health-related terms, and the ability to access, understand, evaluate, and apply health information in everyday life is encompassed by it (WHO, 2025; Van Boxtel et al., 2024). In the context of cancer, the recognising of risk factors, the understanding of warning signs, the adopting of preventive behaviours, and the knowing of when appropriate medical care should be sought are included by health literacy. It has been shown by research that adolescents' levels of health literacy are still uneven and are shaped by the social, behavioural, and informational environments in which they live (Zhong et al., 2026). It is suggested by other studies that although cancer is aware of by many adolescents, a comprehensive understanding of cancer symptoms, risk behaviours, or appropriate help-seeking decisions is not necessarily translated into by this awareness (Lawrence et al., 2025a).

The ways in which health information is accessed by adolescents have been changed significantly in recent years. Digital platforms and social media have become increasingly important sources of health information, by which adolescents are enabled to seek initial information and to compare it with what is learned from schools, families, and their wider social environment (Amon et al., 2025; Seo et al., 2025). However, the ability to critically evaluate the credibility and quality of information sources is not always accompanied by frequent use of digital media. Health misinformation is widespread across social media platforms, and adolescents' understanding of diseases, including cancer, can be negatively influenced by it (Suarez-Lledo & Alvarez-Galvez, 2021; Chandrasekaran et al., 2024; Wang & Togher, 2024). In the context of cancer, misconceptions about risk factors, treatment options, and the disease itself may be reinforced by exposure to misleading information on social media, so that fear and uncertainty are increased (Loeb et al., 2024).

A gap between general awareness of cancer and more comprehensive knowledge has been highlighted by several studies. Although awareness of specific types of cancer may be relatively high, adolescents' understanding of cancer causes, symptoms, prevention, and appropriate follow-up is still limited (Avinu et al., 2026). It was likewise found by a systematic review by Lawrence et al. (2025b) that low awareness of cancer symptoms is generally had by adolescents and that barriers are encountered when a decision on whether medical help should be sought is made. In contrast, it has been shown that adolescents' recognition of cancer risk factors and symptoms is improved by school-based educational interventions (Al-Hosni et al., 2023). It is suggested by these findings that the key challenge is not only lain in the availability of information but also in how cancer-related information is organised, communicated, and understood by adolescents.

A crucial role in the determination of whether health information is effectively understood by adolescents is played by the way it is communicated. High-quality communication, a sense of safety and privacy, and the use of age-appropriate language are key components of adolescent-friendly health services (Dayal & Gundi, 2022). In addition, health literacy has the potential to be strengthened by digital technologies, interactive media, and communication approaches that are aligned with adolescents' preferences and behaviours when they are thoughtfully designed (Mancone et al., 2024; Turuba et al., 2024). Promising opportunities by which adolescents are helped to access more relevant, personalised, and actionable health information are also offered by emerging artificial intelligence (AI)-based tools and digital health applications (Ahamed et al., 2026; Ezeigwe et al., 2025). However, barriers to understanding cannot be overcome by technology alone. Information that is overly technical, densely presented, or fear-inducing may be still found difficult to be comprehended by adolescents, even when it is delivered through digital platforms that are used by them regularly.

Adolescents' knowledge of cancer, information-seeking behaviours, or the effectiveness of cancer education interventions have been focused on by most previous studies. Although valuable insights are provided by these studies, a limited understanding of how the process of receiving and making sense of cancer-related information is experienced by adolescents is offered by them, particularly when that information is unfamiliar, fragmented, difficult to interpret, or fear is evoked by it before it is fully understood. This gap is especially relevant among vocational high school (SMK) students in Indonesia, who are in late adolescence and are increasingly expected to make independent health decisions as they are prepared to enter the workforce or pursue higher education. It was found by a preliminary study that was conducted at SMK Negeri 14 Medan that adolescents were exposed to cancer-related information incidentally through classroom learning, health counselling, social media, family members, and their surrounding environment rather than through structured cancer education programmes. Within the same context, behaviours that are associated with an increased risk of cancer, such as smoking and frequent fast-food consumption, were also identified. It is suggested by these findings that a disconnect between exposure to cancer-related risk factors,

the availability of health information, and adolescents' ability to interpret and apply that information meaningfully is present. The novelty of this study is lain in its phenomenological exploration of how cancer-related information is experienced and constructed meaning from by vocational high school students, rather than knowledge levels or changes in scores following educational interventions merely being measured. Therefore, in this study the barriers that are encountered by adolescents in the receiving and understanding of cancer-related information are aimed to be explored.

2. Methods

2.1 Design

A qualitative design using a descriptive phenomenological approach was employed by this study. This approach was selected, so that adolescents' lived experiences as cancer-related information was perceived, interpreted, and sought to be understood by them were explored and described, without theoretical interpretations being imposed on their accounts. The opportunity for their experiences to be shared in their own words and from their own perspectives was provided to participants by semi-structured interviews. Throughout the data collection and analysis process, reflective journaling was engaged in by the researchers, so that their preconceptions were identified and bracketed and reflexivity was enhanced. The data were analysed manually following Colaizzi's phenomenological method, by which repeated reading of the transcripts, identification of significant statements, formulation of meanings, clustering of themes, and development of an exhaustive description of the phenomenon were involved. The study is reported in accordance with the Consolidated Criteria for Reporting Qualitative Research (COREQ), so that the transparency and rigour of the research process are enhanced.

2.2 Setting

The study was conducted at SMK Negeri 14 Medan, Indonesia. This site was selected based on preliminary findings by which it was indicated that students had been exposed to cancer-related information through classroom learning, health counselling, social media, family members, and their surrounding environment. However, this exposure was occurred incidentally rather than through a structured cancer education programme. Behaviours that are associated with an increased risk of cancer, including smoking and frequent fast-food consumption, were also identified by preliminary observations. An appropriate setting by which the relationships between exposure to cancer-related information, adolescents' experiences of the understanding of health messages, and behaviours that are associated with cancer risk were explored was provided by these contextual characteristics. The study site was not intended to be representative of all vocational high schools in Indonesia; rather, it was purposively selected, so that an in-depth exploration of the phenomenon within a specific contextual setting was facilitated.

2.3 Participants

Participants were recruited using purposive sampling. The inclusion criteria were: (1) Grade XII students aged 17–19 years; (2) ability to communicate in Indonesian; (3) willingness to participate in an interview; and (4) prior exposure to cancer-related information and experience of the attempting to understand it. Grade XII students were selected, because they are in late adolescence, relatively well-developed reflective and verbal abilities by which their experiences are articulated are possessed by them, they are increasingly independent in the accessing and evaluating of health information, and they are prepared to be transitioned to either higher education or the workforce. They were made particularly suitable for the exploring of how information about cancer is interpreted, constructed meaning from, and responded to by adolescents by these developmental characteristics. A total of 18 students were participated in the study, comprising nine females and nine males. Participant recruitment was facilitated by the school, by which students who met the inclusion criteria were assisted to be identified. However, participation was entirely voluntary. All eligible students were informed of their right to decline participation or to withdraw from the study at any time without penalty or adverse consequences.

2.4 Data collection

Data were collected between October and December 2022 through semi-structured, face-to-face interviews that were conducted in a private setting within the school. Each interview lasted approximately 45–60 minutes and was audio-recorded with participants' informed consent. The interviews were conducted by the first author, by whom experience in qualitative research is had and by whom the preliminary data analysis was responsible to be conducted. So that reflexivity was enhanced, reflective memos were maintained by the researcher throughout the research process, by which preconceptions, emotional responses, emerging insights, follow-up questions, and analytical decisions were documented. Participants' sources of cancer-related information, their emotional responses to the receiving of such information, their

understanding of the information that had been received, and the aspects that were found most difficult to be understood were focused on by the interview guide. Follow-up questions were used flexibly, so that where, from whom, and through which media cancer-related information was obtained by participants were explored, while responses were also clarified, concrete examples were elicited, and richer descriptions of their lived experiences were encouraged.

Table 1. Interview Guidelines

Interview questions
1. Where, from whom, and what media did you get cancer information?
2. How do you feel when you hear cancer information?
3. To what extent is the cancer information you receive understandable?
4. What part of the cancer information is the most difficult for you to understand?

2.5 Data analysis

Data analysis was begun concurrently with data collection and was continued after all interviews had been completed. Audio recordings were transcribed verbatim and were read repeatedly, so that immersion in the data was achieved and a comprehensive understanding of participants' accounts was gained. The initial manual analysis was conducted by the first author following Colaizzi's phenomenological method, by which the identifying of significant statements, the formulating of meanings, the clustering of meanings into categories and themes, the developing of an exhaustive description of the phenomenon, and the deriving of its essential structure were involved. The emerging codes, categories, themes, and their supporting quotations were subsequently reviewed through regular discussions with the research team until consensus was reached. Field notes, reflective memos, and a theme–quotation matrix were used, so that an audit trail was maintained and the transparency of the analytical process was enhanced. Participant recruitment was ceased when data saturation was achieved, as was indicated by repetitive information and the absence of new themes.

2.6 Trustworthiness

The trustworthiness of the study was ensured through several strategies that are based on Lincoln and Guba's criteria. Credibility was enhanced through repeated reading of the interview transcripts, the use of verbatim participant quotations, and real-time confirmation of meaning at the end of each interview. During this process, the key points from the participants' responses were summarised by the interviewer, and they were invited so that their accounts were confirmed, clarified, corrected, or elaborated on. This approach was served as an immediate clarification of participants' intended meanings during the interview rather than as a formal member-checking procedure by which the return of complete transcripts or findings was involved. Source triangulation that involved teachers, parents, or documentary data was not undertaken, because adolescents' lived experiences of the receiving and understanding of cancer-related information were specifically focused on by the study. Dependability and confirmability were supported through the maintenance of an audit trail by which the analytical process, including the relationships among significant statements, codes, categories, themes, and supporting quotations, was documented. Transferability was enhanced by the providing of a rich description of the research setting, participant characteristics, sources of exposure to cancer-related information, and sufficient illustrative quotations, so that the applicability of the findings to other contexts was enabled to be determined by readers.

2.7 Ethics

Ethical approval for this study was obtained from the Medical and Health Research Ethics Committee, Faculty of Medicine, Public Health, and Nursing (FKKMK), Universitas Gadjah Mada (Approval No. KE/FK/1360/EC/2022). Detailed information about the study's objectives, interview procedures, potential benefits and minimal risks, data confidentiality, and their right to decline to answer any question or to withdraw from the study at any time without any adverse consequences was received by all participants. In accordance with the approved ethical protocol, written informed consent was provided independently by participants aged 18–19 years. For participants aged 17 years, written assent was obtained from the participants, together with written informed consent from their parents or legal guardians. So that participants' privacy and confidentiality were protected, all identifying information was removed, and identification codes (P1–P18) were assigned to participants throughout the study.

3. Results

3.1 Characteristics of participants

A total of 18 adolescents completed the interview process, comprising nine females and nine males aged 17–19 years. Cancer-related information was reported to be obtained by participants from a variety of sources,

including classroom learning and health counselling at school, social media, family members, peers, and their surrounding environment. The sources and frequency of information exposure were varied across participants. Only brief or fragmented explanations were recalled by some, whereas online content had been read or cancer had been learned about through the experiences of people around them by others. Despite these differences, all participants had been exposed to cancer-related information and had attempted to make sense of aspects that were found difficult to be understood, so that their experiences were made highly relevant to the phenomenon under investigation. A general awareness that healthy lifestyle behaviours, such as the eating of a balanced diet, the avoiding of tobacco use, the maintaining of personal hygiene, and the engaging in regular physical activity, are involved in cancer prevention was demonstrated by most participants. However, their understanding was still superficial and was not consistently linked to cancer risk factors, warning signs, early detection, or appropriate help-seeking. An overview of participants' demographic characteristics is presented in Table 2, while the themes and subthemes that were identified through the analysis are summarised in Table 3.

Table 2. Demographic characteristics of participants

No.	Participants	Gender	Age
1	P1	Women	17 years
2	P2	Women	17 years
3	P3	Women	17 years
4	P4	Women	17 years
5	P5	Women	18 years
6	P6	Male	17 years
7	P7	Male	18 years
8	P8	Male	18 years
9	P9	Male	17 years
10	P10	Women	17 years
11	P11	Male	17 years
12	P12	Women	17 years
13	P13	Women	17 years
14	P14	Women	17 years
15	P15	Male	17 years
16	P16	Male	18 years
17	P17	Male	17 years
18	P18	Male	19 years

3.2 Thematic findings

Three overarching themes by which adolescents' experiences of the attempting to understand cancer-related information were captured were generated by the analysis: (1) difficulty in the understanding of complex and diverse cancer-related information; (2) difficulty in the filtering and prioritising of extensive and complex cancer-related information; and (3) difficulty in the coping with uncertainty before an adequate understanding of cancer-related information was developed. Interconnected aspects of adolescents' lived experiences rather than separate or isolated phenomena are represented by these themes.

Table 3. Themes and Subthemes

Theme	Sub-theme
Difficulty understanding complex and diverse cancer information	Cancer information is still minimal and unclear
	Medical terms are difficult to understand
	The language of delivery is not in line with the way teenagers communicate
Difficulty sorting through extensive and complex cancer information	Cancer material feels too broad
	Difficult to determine the most important information
	Confused between symptoms, prevention, and treatment
Difficulty coping with uncertainty before understanding cancer information	Fear of cancer
	Cancer is interpreted as a threat of death
	Prevention is still generally understood

Theme 1. Difficulty understanding complex and diverse cancer information

Participants' initial experiences of the encountering of cancer-related information that was fragmented, delivered inconsistently, and communicated using unfamiliar terminology are described by this theme. It was perceived by participants not only that the information that was received was limited but also that a coherent understanding of what cancer is, why it is developed, and what actions should be taken was failed to be provided by it. Their experiences are reflected in three interrelated subthemes: (1) limited and fragmented cancer-related information; (2) unfamiliar medical terminology; and (3) communication that was not aligned with adolescents' everyday language.

Sub-theme 1. Cancer information is still minimal and unclear

Cancer-related information was obtained by participants from schools, social media, family members, peers, and their wider social environment. However, information was provided by these sources in an incidental and fragmented manner rather than through structured and continuous educational experiences. When information was encountered only occasionally or was presented too briefly, one explanation was found difficult to be connected with another and a coherent understanding of the topic was found difficult to be developed by participants. Although the term *cancer* was familiar to them, they did not feel sufficiently knowledgeable so that the disease was confidently explained or its key concepts were understood.

> *"There has been very little education about cancer. So far, we have rarely received detailed and comprehensive information, so our understanding of cancer remains limited and incomplete." (P1)*
>
> *"The information about cancer that I have received is still unclear. Sometimes the explanations are too brief, so I don't fully understand what they mean." (P5)*
>
> *"The information about cancer that I have received is still insufficient. I know a few things in general, but I have not received a more complete explanation about cancer." (P9)*

Sub-theme 2. Medical terms are difficult to understand

For participants, Latin terminology, scientific names for different types of cancer, and clinical vocabulary were represented as barriers to understanding at the lexical level. The need for unfamiliar terms to be remembered before their meanings could be understood was often felt by them. As a result, the information was easily forgotten, and it was reported by participants that explanations in simpler, more familiar language were needed before it could be fully comprehended.

> *"I have difficulty remembering the Latin terms used to explain cancer. They sound unfamiliar and are difficult for me to understand and remember." (P2)*
>
> *"The scientific names used for different types of cancer are difficult for me to understand. It is much easier for me when they are explained again in simple, everyday language." (P8)*

Sub-theme 3. The language of delivery is not appropriate for the way teenagers communicate

The difficulty was arisen not only from unfamiliar terminology but also from the way the information was organised and communicated. Formal language, overly concise explanations, and a lack of examples that were relevant to adolescents' everyday lives were described as barriers to the understanding of the intended meaning of the information by participants. It was reported by them that explanations were much easier to be followed when the language, examples, and scenarios were reflected their daily experiences and were presented in ways that were familiar and relatable.

> *"I don't understand the language used by doctors, especially the medical or Latin terms. Cancer information would be much easier for me to understand if it were explained in simpler language." (P4)*
>
> *"The information about cancer is difficult to understand and remember. It would be easier to remember if the explanations included examples that are relevant to teenagers." (P10)*

Theme 2. Difficulty sorting through extensive and complex cancer information

After cancer-related information was received, a second challenge was encountered by participants: the organising of information and the understanding of the relationships among its different components. Information about symptoms, risk factors, cancer types, diagnosis, staging, prevention, and treatment was perceived as equally important but was not presented in a logical or easily understandable sequence. As a result, participants were felt overwhelmed, were uncertain about where to begin, and struggled so that the purpose and relevance of each type of information were distinguished.

Sub-theme 1. Cancer material feels too broad

Cancer was described by participants as a topic by which a wide range of disease types, causes, symptoms, stages, and treatment options is encompassed. A coherent understanding was made difficult to be developed by the breadth of this information, even when explanations were provided. Rather than a comprehensive understanding being progressively built towards, information that should have complemented

one another was often presented simultaneously, so that cognitive overload was resulted in and the material was made more difficult to be comprehended.

> *"There are so many types of cancer and so much information about how to prevent them that it's difficult to understand everything. The different cancer types, causes, and preventive measures made it confusing." (P1)*
>
> *"The information about cancer covered many topics at once, including symptoms, the diagnostic process, disease staging, and treatment. Because all of this information was presented simultaneously, I found it difficult to understand." (P14)*
>
> *"I was confused about the factors that affect cancer treatment and how the disease is treated, so I didn't know which information I should learn first." (P6)*

Sub-theme 2. Difficult to determine the most important information

When multiple topics were presented simultaneously, which information should be understood first was struggled to be determined by participants. A conceptual framework by which foundational knowledge, warning signs, preventive measures, diagnostic processes, and treatment options were distinguished had not yet been developed by them. Consequently, their attention was shifted from one topic to another without an integrated understanding that could be applied in practice being developed.

> *"The symptoms, diagnosis, stages, and treatment of cancer were all explained at the same time. There was too much information to understand at once. I became confused and found it difficult to distinguish between the symptoms, the diagnostic process, the stage of the disease, and the available treatments." (P4)*
>
> *"I was confused about the factors that increase the risk of developing cancer and how the disease is treated. I didn't have a clear understanding of the relationship between risk factors, preventive measures, and what someone should do if they are diagnosed with cancer." (P12)*

Sub-theme 3. Confused between symptoms, prevention, and treatment

Confusion was experienced by participants when three categories of information that served different purposes were attempted to be distinguished among. Information about symptoms is intended so that warning signs are recognised by individuals, how cancer risk is reduced is explained by preventive information, and care after a diagnosis has been established is related to by treatment information. However, these categories were described as frequently overlapping or as being presented without clear distinctions by participants, so that they were left uncertain about which actions were appropriate at different stages of the disease or prevention process.

> *"I'm still confused about how to prevent cancer. I know that maintaining a healthy lifestyle is important, but I still don't clearly understand what specific actions can reduce the risk of developing cancer." (P3)*
>
> *"I'm still confused about the factors that can affect cancer treatment and how the disease can be managed. The information I received did not clearly explain what steps should be taken if someone is diagnosed with cancer." (P16)*

Theme 3. Facing fear and uncertainty before understanding is formed

It is suggested by this theme that emotional responses were often emerged before a sufficient understanding of cancer had been developed by participants. Upon cancer being heard about, it was immediately associated with severe illness, suffering, and death by participants. These fears appeared to be reinforced by uncertainty about cancer symptoms, preventive measures, and treatment options, while participants' understanding of cancer prevention was still limited to general recommendations for the maintaining of a healthy lifestyle.

Sub-theme 1. Fear of cancer

For many participants, feelings of fear, apprehension, and the perception of a disease that is difficult to be treated were immediately evoked by the word *cancer*. These emotional responses were not necessarily based on personal experience but were also shaped by broader narratives that were encountered through family, the community, traditional media, and social media. Before more specific aspects of cancer were discussed, it was consistently described as a highly serious and life-threatening disease by participants.

> *"I was scared when I first learned about cancer. Hearing the word cancer made me think of a serious disease that is difficult to treat." (P10)*
>
> *"I immediately felt worried when I heard about cancer. It made me more cautious because cancer can develop without people realising it and can have serious consequences for their health." (P5)*
>
> *"Cancer is a serious and life-threatening disease. It feels frightening because it can progress and put a person's life at risk." (P7)*

Sub-theme 2. Cancer is interpreted as a threat of death

Cancer was associated with the possibility of death by participants before early detection or available treatment options were discussed. It is suggested by this interpretation that, in the absence of a clear understanding of other aspects of the disease, the most salient image that is associated with cancer is become by death. As a result, cancer was perceived by participants as a condition that could affect anyone and was therefore viewed as an immediate, serious, and unavoidable threat.

> *"Cancer can lead to death if it is not treated properly. Therefore, it should not be ignored and needs to be treated as early as possible." (P13)*
>
> *"Cancer is a disease that can affect anyone and can be life-threatening. Because of that, I consider cancer to be a very dangerous disease." (P18)*

Sub-theme 3. Prevention is still generally understood

Despite fear about cancer being expressed, some prior knowledge of healthy lifestyle behaviours was demonstrated by participants. Healthy eating, the avoiding of smoking, the engaging in regular physical activity, and the reducing of exposure to harmful chemicals were identified by them as important preventive measures. However, this knowledge was still general and was not accompanied by an understanding of how cancer risk is influenced by specific behaviours, which warning signs require medical attention, or when and how professional healthcare should be sought.

> *"Cancer can be prevented by eating a healthy diet, avoiding smoking, and exercising regularly. Maintaining a healthy lifestyle helps keep the body healthy and may reduce the risk of developing cancer." (P11)*
>
> *"Cancer can be prevented by eating healthy foods and reducing exposure to harmful chemicals. Paying attention to the food we eat and the substances we are exposed to in daily life, in my opinion, can help maintain good health." (P15)*
>
> *"Cancer can be prevented by limiting the consumption of fast food and exercising regularly to maintain good health and reduce the risk of disease." (P17)*

Overall, a sequence of experiences by which the encountering of unfamiliar and fragmented information was begun, confusion in the organising and interpreting of that information was progressed to, and fear and the perception of cancer as a life-threatening disease closely associated with death were ultimately culminated in was described by participants' accounts.

4. Discussion

It is suggested by the findings of this study that adolescents' barriers to the understanding of cancer-related information are arisen when information is presented in a limited, fragmented, or unfamiliar manner. An insufficient foundation on which a coherent understanding of new concepts can be built by adolescents is provided by such information. When information about symptoms, risk factors, diagnosis, cancer staging, prevention, and treatment is presented simultaneously without a clear organisational structure, what has been learned is struggled to be organised, prioritised, and integrated by adolescents. In the absence of a well-developed knowledge framework, participants' understanding was become dominated by the most emotionally salient interpretation of cancer, as a frightening disease closely associated with death. Adolescents may be led by this strong emotional response so that threatening aspects of cancer are primarily focused on while less attention is given to messages about prevention, early detection, and appropriate help-seeking. In contrast, uncertainty can be reduced and more thoughtful processing of health information can be supported by information that is communicated clearly, progressively, and in ways that are relevant to adolescents' everyday experiences. Viewed through the lens of health literacy, it is demonstrated by these findings that adolescents are not necessarily enabled to understand, critically evaluate, and apply health information in their daily lives by access to information alone (Van Boxtel et al., 2024; WHO, 2025).

A gap between the availability of information channels and the accessibility of meaningful understanding is highlighted by participants' accounts of limited counselling, brief explanations, and incomplete information. Although adolescents were exposed to cancer-related information through schools, families, social media, and their wider social environment, this exposure was often incidental and fragmented rather than systematic. Consequently, a coherent understanding of fundamental issues, such as what cancer is, which risk factors are relevant to adolescents, which warning signs require attention, and when professional medical advice should be sought, was not developed into by the information that was received. It is suggested by these findings that access to health information should be evaluated not only by the number of available information sources but also by the continuity, clarity, coherence, and practical usefulness of the messages that are conveyed. The significance of these findings is further strengthened by the vocational school context.

As adulthood is approached by adolescents, independent health-related decisions are increasingly made by them, yet cancer information at school was described as being received in an unstructured manner by participants. Consequently, information from multiple sources that differed in credibility, completeness, and depth was required to be integrated by them. It has been shown by previous research that adolescents are active users of digital platforms for the seeking of health information, but their ability to evaluate and compare information is strongly influenced by their social environment and prior experiences (Amon et al., 2025; Seo et al., 2025). Therefore, the importance of school-based cancer education as a structured reference framework by which adolescents are helped to interpret, evaluate, and integrate information that is obtained from multiple sources is underscored by these findings.

A semantic gap between professional health knowledge and adolescents' everyday understanding was created by unfamiliar medical terminology. Not only were scientific terms struggled to be remembered by participants, but those terms were also found difficult to be connected with their practical meanings. When cognitive effort is directed primarily towards the recognising of unfamiliar terminology, fewer cognitive resources are remained available for the understanding of causal relationships, the recognising of symptoms, the evaluating of risks, and the identifying of appropriate actions. As a result, cancer-related knowledge may be reduced to a collection of memorised terms rather than a meaningful and usable understanding. It is suggested by these findings that the use of clear, age-appropriate language is a fundamental component of effective health communication rather than merely a matter of the simplifying of style. Medical terminology should be introduced only when necessary and should be accompanied immediately by plain-language explanations, concrete examples, and opportunities for adolescents' understanding to be confirmed. Adolescents can be encouraged by healthcare professionals and educators so that information is explained in their own words, so that misunderstandings are identified and any remaining gaps in comprehension are clarified. This approach is consistent with evidence by which the importance of high-quality communication and language appropriateness in adolescent-friendly health services is highlighted (Dayal & Gundi, 2022).

It is suggested by participants' requests for examples that reflected adolescents' everyday experiences that comprehension is depended not only on the complexity of the language that is used but also on the relevance of the context in which information is presented. Messages by which cancer risks are explained through familiar situations, such as exposure to cigarette smoke, dietary choices, physical activity, or the seeking of health information through social media, are more readily connected to adolescents' daily lives. Adolescents are helped to recognise that cancer is not a distant or abstract issue but one that is directly relevant to their own health and future well-being by this contextual relevance. Scientific accuracy is not required to be compromised by the using of age-appropriate language. Instead, the challenge is that medical concepts are translated into language that can be understood by adolescents without their meaning being altered, while open dialogue is encouraged and opportunities for questions that may be perceived as sensitive or frightening to be discussed are provided. A greater sense of psychological safety can be fostered and active participation in health discussions can be encouraged by non-judgemental communication, respect for privacy, and acknowledgement of adolescents' emotional concerns (Dayal & Gundi, 2022). Similarly, engagement and understanding can be enhanced by digital and interactive educational media when they are designed around adolescents' learning preferences and communication habits, rather than dense medical information simply being transferred onto digital platforms (Mancone et al., 2024; Turuba et al., 2024).

The breadth of cancer-related information was emerged as a significant barrier, because numerous topics without a clear organisational framework were exposed to participants. In their experiences, information about cancer types, causes, symptoms, stages, diagnosis, prevention, and treatment was often presented as a large body of disconnected content by which understanding all at once seemed to be required. The primary challenge was therefore not simply the volume of information, but the absence of a conceptual framework by which how these different components were related was explained. Without such a framework, greater cognitive burden was experienced by adolescents with limited prior knowledge, and they frequently felt overwhelmed when the information was attempted to be made sense of. It is suggested by these findings that cancer education should be organised in a progressive and structured manner. Fundamental concepts of cancer should be focused on by initial learning, and risk factors, warning signs, diagnosis, and prevention should be clearly distinguished among. Once this conceptual foundation has been established, education can be expanded, so that preventive behaviours, appropriate responses to potential symptoms, and an overview of available treatment options are included. More detailed information about specific cancer types, staging, or treatment approaches can then be introduced as a stronger understanding of the subject is developed by adolescents. It has been shown by previous research that adolescents' recognition of cancer risk factors and warning signs is improved by structured educational interventions (Al-Hosni et al., 2023). This evidence is

extended by the present findings, in that why a clear and progressive educational structure is essential for meaningful understanding is demonstrated from adolescents' lived experiences.

It is suggested by participants' difficulty in the prioritising of cancer-related information that a sufficiently organised knowledge framework had not yet been developed by them. As a result, information that is needed for the maintaining of health and the preventing of disease, information by which warning signs that require medical attention are helped to be recognised, and information that is become relevant only after a cancer diagnosis were struggled to be distinguished between by them. Without a clear hierarchy of information, all topics appeared equally important, so that an appropriate starting point for the understanding of cancer was made difficult to be identified by adolescents. Adolescents may also be discouraged by this lack of prioritisation from the seeking of further explanations, or they may be led so that the most dramatic or emotionally charged aspects of cancer are disproportionately focused on rather than information that is most relevant to prevention and early detection.

An action-oriented approach by which the knowledge and skills that are needed by adolescents so that informed health decisions are made are prioritised should be adopted by education. Modifiable cancer risk factors, warning signs that require attention, how trustworthy sources of health information are identified, and appropriate help-seeking pathways should be focused on by initial educational content. More detailed topics, such as diagnosis, cancer staging, and treatment, can then be introduced as a stronger conceptual understanding is developed by adolescents. Abstract knowledge is helped to be transformed into practical guidance for health-related decision-making by this progressive sequence. The low awareness of cancer symptoms and the barriers to help-seeking that are reported among adolescents by Lawrence et al. (2025a, 2025b) may, in part, be reflected by the way cancer information is commonly organised and presented. When educational messages are not structured around practical decision-making, general knowledge may be struggled to be translated into appropriate health actions by adolescents.

Fear was emerged as the most immediate emotional response among participants. Cancer was commonly described by them as a serious disease that is difficult to be treated and that may be developed without obvious symptoms. Both adaptive and maladaptive implications are had by this emotional response. On one hand, greater health awareness and vigilance may be encouraged by a certain degree of concern. On the other hand, when communication is focused primarily on the severity of the disease without clear guidance on preventive actions or available support being provided, fear may be developed into anxiety, avoidance, or the uncritical acceptance of inaccurate information. It is suggested by these findings that information about risk should be balanced with messages by which adolescents' confidence in their ability to take appropriate action is strengthened by effective cancer communication. Discussions of the seriousness of cancer should therefore be accompanied by practical information about prevention, early detection, appropriate help-seeking, and available sources of support. The seriousness of cancer is not minimised by an emotionally supportive communication approach; rather, the framing of the disease in ways by which adolescents are left feeling helpless or powerless is avoided by it. This is particularly important in digital environments, where fear can be amplified without understanding being improved by sensationalised content and health misinformation (Loeb et al., 2024; Wang & Togher, 2024).

The meanings that were constructed by participants when information about disease progression and treatment opportunities was incomplete or unbalanced are reflected by their perception of cancer as a disease that is inevitably led to death. Although cancer is a serious and potentially life-threatening condition, a deterministic view by which the potential benefits of early detection, timely treatment, and advances in cancer care are overlooked is created by its being directly equated with death. That many cancers can be managed more effectively when they are identified at an early stage may be discouraged from being recognised by adolescents by such perceptions. The gap between general awareness and more comprehensive knowledge of cancer is helped to be explained by these findings. It may be recognised by adolescents that cancer is a serious disease while its warning signs are remained unable to be identified, relevant risk factors are remained unable to be understood, or when professional medical advice should be sought is remained unable to be determined (Avinu et al., 2026; Lawrence et al., 2025a). Therefore, a balanced and evidence-based perspective by which the seriousness of the disease is acknowledged while it is also emphasised that outcomes are varied according to cancer type, stage at diagnosis, treatment response, and the benefits of early detection and timely intervention should be presented by cancer education.

An important foundation for cancer prevention education is provided by participants' awareness of healthy eating, regular physical activity, and smoking avoidance. However, it is indicated by the findings that although basic knowledge of these healthy behaviours was possessed by adolescents, their understanding was still largely remained at the level of general health recommendations. The links between specific

behaviours and cancer risk, as well as knowledge of warning signs, early detection, and appropriate help-seeking pathways, were often unclear. Consequently, the ability to critically evaluate health information or to make informed health-related decisions had not yet been developed into by this general awareness. It is suggested by these findings that adolescents' existing knowledge should be built on by cancer education, while they are helped to understand the underlying rationale, practical implications, and limitations of preventive recommendations (Van Boxtel et al., 2024; WHO, 2025). For example, the risks that are associated with both active and passive smoking, the health benefits of tobacco use never being initiated or being quit, and practical strategies by which peer pressure is resisted should be explained by messages by which adolescents are encouraged to avoid smoking. Similarly, recommendations about healthy eating should be translated into realistic dietary choices that can be adopted by adolescents at home and at school. Through this approach, cancer prevention can be moved beyond simple health messages and be become a meaningful basis for informed decision-making and sustained healthy behaviours.

An important setting for the delivering of consistent and developmentally appropriate cancer education can be served as by schools. Cancer-related concepts should be introduced progressively by educational programmes, and basic knowledge, risk factors that are relevant to adolescents' daily lives, common warning signs, preventive behaviours, strategies by which the credibility of digital health information is evaluated, and appropriate help-seeking practices should be begun with. The content should be delivered using age-appropriate language, relatable examples, visual materials, case-based discussions, and interactive questioning, so that engagement and understanding are enhanced. Rather than information on all types of cancer being presented simultaneously, a clear conceptual framework by which new cancer-related information is enabled to be interpreted, evaluated, and integrated as it is encountered should be provided to adolescents by educational programmes.

A vital role in the translating of complex medical information into language that can be understood by adolescents while a supportive and emotionally safe learning environment is also created is played by school nurses, community nurses, and other healthcare professionals. Effective educational practice should be begun with an assessment of adolescents' existing knowledge, beliefs, and concerns about cancer. Unexplained medical terminology should be avoided, information should be presented in manageable sections, adolescents should be encouraged so that their understanding is explained in their own words, and misconceptions should be addressed in a supportive and non-judgemental manner by healthcare professionals.

Emotional responses should also be acknowledged and validated before additional information is introduced, because complex health information may be less able to be processed effectively by adolescents by whom high levels of fear or anxiety are experienced. Digital platforms are remained an important channel for the delivering of cancer-related information, because they are embedded in adolescents' everyday lives. However, digital health literacy skills by which the credibility of online information sources is enabled to be evaluated also need to be developed by adolescents. Educational materials should therefore be concise, visually engaging, interactive, and linked to reliable official sources. Considerable potential by which personalised explanations and educational support are provided is also offered by artificial intelligence–based technologies. Nevertheless, their use should be guided by evidence-based information, transparency regarding their limitations, and recognition that consultation with qualified healthcare professionals is intended to be complemented, not replaced, by them (Ahamed et al., 2026; Ezeigwe et al., 2025). Without adequate digital health literacy, not only as a valuable source of health information but also as a source of confusion and misinformation may social media be functioned (Suarez-Lledo & Alvarez-Galvez, 2021; Loeb et al., 2024).

Limitation

Several limitations are had by this study. First, it was conducted in a single vocational high school, so that participants' experiences were shaped by the school's culture, social environment, and local context, which may be differed from those of adolescents who attend general secondary schools. Although the recruitment of participants with direct experience of the phenomenon under investigation was enabled by purposive sampling, findings that are statistically representative of the wider adolescent population were not intended to be produced by it. Second, participants' recollections and their ability to articulate past experiences were relied on by the findings, so that they were made potentially susceptible to recall bias. In addition, participants' willingness to discuss sensitive topics, such as smoking, dietary habits, and other health-related behaviours, may have been influenced by the conducting of interviews within the school setting. Third, formal member checking through the return of interview transcripts or interpreted findings was not undertaken, and data triangulation with teachers, parents, educational materials, or participants'

digital media use was not performed. While rich and in-depth insights into adolescents' perspectives were provided by the exclusive focus on their lived experiences, opportunities for their accounts to be verified using additional sources of information were limited by it. Finally, participants' interpretations of cancer and death may have been influenced by their cultural background, language, family experiences with cancer, and access to health services. Therefore, the transferability of these findings should be considered in relation to the similarity of the study context and participant characteristics. Adolescents from more diverse educational and geographical settings should be included, experiences across different educational contexts should be compared, and school-based or digitally delivered cancer education interventions that are informed by the findings of this study should be evaluated by future research.

5. Conclusion

Barriers to the understanding of cancer-related information were experienced by adolescents in this study as a series of interconnected experiences. A coherent foundation for the understanding of cancer was made difficult to be established by limited and fragmented information, poor organisation, and unfamiliar medical terminology. Their ability to prioritise and to distinguish between cancer symptoms, prevention, diagnosis, and treatment was further challenged by the broad scope of the information. In the absence of a well-developed knowledge framework, cancer was initially perceived by participants as a frightening disease closely associated with death, while prevention was understood primarily as a set of general healthy lifestyle recommendations. It is suggested by these findings that scientifically accurate information does not necessarily become meaningful unless it is communicated in clear, age-appropriate language, is presented in a logical and progressive sequence, is supported by relevant examples, is delivered through trusted sources, and is conveyed in a psychologically supportive manner. The important role of schools and nursing professionals in the collaborating to develop adolescent-centred cancer education by which young people are enabled not only to understand health information but also to critically evaluate and apply it in their everyday lives is also highlighted by the findings.

References

Ahamed, S., Chowdhury, M. H., Zaman, M., Agarwala, A., Al Mashud, M. A., Al Muntasir, T., Rahman, R., Shahriyar, R., Sarker, F., & Mamun, K. A. (2026). SuSastho.AI: A multimodal medical copilot for adolescents using evidence-based medicine and large language models. *Informatics in Medicine Unlocked*, *60*. https://doi.org/10.1016/j.imu.2025.101720

Al-Hosni, K., Chan, M. F., & Al-Azri, M. (2023). Effectiveness of an Educational Program on Awareness of Cancer Risk Factors, Symptoms, and Barriers to Medical Help-Seeking Among Adolescent Omani Students: an Interventional Study. *Journal of Cancer Education*, *38*(4), 1304–1312. https://doi.org/10.1007/s13187-023-02263-2

Amon, K. L., Wattelez, G., Nedjar-Guerre, A., Forsyth, R., Peralta, L. R., Urvoy, M. J., Caillaud, C., & Galy, O. (2025). Exploring the Digital Health Landscape: How adolescents living in urban and rural Vanuatu use online platforms to access health information. *Open Research Europe*, *5*, 1–28. https://doi.org/10.12688/openreseurope.19670.3

Avinu, E. S., Yeboah, R. N. Y., Bediako Agyei, F., & Petershie, B. E. (2026). Awareness and Knowledge of Penile Cancer Among University Students in Ghana. *American Journal of Men's Health*, *20*(2). https://doi.org/10.1177/15579883261443703

Bray, F., Laversanne, M., Sung, H., Ferlay, J., Siegel, R. L., Soerjomataram, I., & Jemal, A. (2024). Global cancer statistics 2022: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. *CA: A Cancer Journal for Clinicians*, *74*(3), 229–263. https://doi.org/10.3322/caac.21834

Chandrasekaran, R., Sadiq, M. T., & Moustakas, E. (2024). Racial and Demographic Disparities in Susceptibility to Health Misinformation on Social Media: National Survey-Based Analysis. *Journal of Medical Internet Research*, *26*. https://doi.org/10.2196/55086

Dayal, R., & Gundi, M. (2022). Assessment of the quality of sexual and reproductive health services delivered to adolescents at Ujala clinics: A qualitative study in Rajasthan, India. *PLoS ONE, 17*(1 January). https://doi.org/10.1371/journal.pone.0261757

Ezeigwe, O. J., Samuel Nwosu, K. O., Afolayan, O. K., Ojaruega, A. A., Echere, J., Desai, M., Onigbogi, M. O., Oladoyin, O. O., Okoye, N. C., & Fwelo, P. (2025). Technological-Based Interventions in Cancer and Factors Associated With the Use of Mobile Digital Wellness and Health Apps Among Cancer Information Seekers: Cross-Sectional Study. *Journal of Medical Internet Research*, *27*. https://doi.org/10.2196/63403

Lawrence, S., Fitzgerald, S., Hegarty, J., & Saab, M. M. (2025b). Cancer awareness among adolescents in

second-level education: A mixed methods systematic review. Health Education Research, 40(3). https://doi.org/10.1093/her/cyaf014

Lawrence, S., Fitzgerald, S., Hegarty, J., & Saab, M. M. (2025a). Cancer awareness among adolescents in Irish schools: A cross-sectional study. PLOS ONE, 20(3), https://doi.org/10.1371/journal.pone.0319252

Loeb, S., Langford, A. T., Bragg, M. A., Sherman, R., & Chan, J. M. (2024). Cancer misinformation on social media. *CA: A Cancer Journal for Clinicians*, *74*(5), 453–464. https://doi.org/10.3322/caac.21857

Mancone, S., Corrado, S., Tosti, B., Spica, G., & Diotaiuti, P. (2024). Integrating digital and interactive approaches in adolescent health literacy: a comprehensive review. *Frontiers in Public Health*, *12*(October). https://doi.org/10.3389/fpubh.2024.1387874

Mytton, O. T., Donaldson, L., Goddings, A. L., Mathews, G., Ward, J. L., Greaves, F., & Viner, R. M. (2024). Changing patterns of health risk in adolescence: implications for health policy. *The Lancet Public Health*, *9*(8), e629–e634. https://doi.org/10.1016/S2468-2667(24)00125-7

Parada, M. L., Horn, J., & Cambron, C. (2025). Examining the continuity of modifiable cancer-risk behaviors from youth into adulthood through prospective longitudinal studies: A scoping review. *Social Science and Medicine*, *384*(April), 118534. https://doi.org/10.1016/j.socscimed.2025.118534

Seo, H., Burkett, K. M., Morales, O., Izhar, N., Chaif, R. H., Coelho, M. B., Ha, H., Jona, B., Iqbal, A., & Doyle, T. (2025). Between likes and lies: how teenage girls navigate online health information. *Frontiers in Communication*, *10*. https://doi.org/10.3389/fcomm.2025.1692428

WHO. (2025). *Key facts*. *Consider using this trope, 2*:4–7.

Suarez-Lledo, V., & Alvarez-Galvez, J. (2021). Prevalence of health misinformation on social media: Systematic review. *Journal of Medical Internet Research*, *23*(1). https://doi.org/10.2196/17187

Turuba, R., Cormier, W., Zimmerman, R., Ow, N., Zenone, M., Quintana, Y., Jenkins, E., Ben-David, S., Raimundo, A., Marcon, A. R., Mathias, S., Henderson, J., & Barbic, S. (2024). Exploring How Youth Use TikTok for Mental Health Information in British Columbia: Semistructured Interview Study With Youth. *JMIR Infodemiology*, *4*. https://doi.org/10.2196/53233

Van Boxtel, W., Jerković-Ćosić, K., Schoonmade, L. J., & Chinapaw, M. J. M. (2024). Health literacy in the context of child health promotion: a scoping review of conceptualizations and descriptions. *BMC Public Health*, *24*(1), 1–13. https://doi.org/10.1186/s12889-024-17955-7

Wang, M. L., & Togher, K. (2024). Health Misinformation on Social Media and Adolescent Health. *JAMA Pediatrics*, *178*(2), 109–110. https://doi.org/10.1001/jamapediatrics.2023.5282

WHO. (2024). Securing adolescent health and well-being today is vital for the health of future generations - WHO. *World Of Organization*, *Adolescent health*, 1. https://www.who.int/news/item/23-09-2024-securing-adolescent-health-and-well-being-today-is-vital-for-the-health-of-future-generations-who

Zhong, C. C., Chen, M., Yang, Z., Li, Z., Keung, V. M. W., Lo, A., Cheung, C., Huang, J., & Wong, M. C. S. (2026). Exploring the factors associated with health literacy among adolescents in Hong Kong. *Scientific Reports*, *16*(1). https://doi.org/10.1038/s41598-025-28900-y