

Review

# Setting the Social Media Stage, a Narrative Review: The Role of Theory and Research in Understanding Adolescent Online Sexual Health Information-Seeking

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**Abstract:** This narrative review offers a deep dive into the theoretical and empirical literature on adolescent online health information-seeking behavior, specifically in relation to sexual health. It presents ways in which motivational influences impact adolescent social media use to seek sexual health information and offers insight into how Longo's comprehensive and integrated model for understanding health information, communication, and information-seeking and self-determination theory may be used as frameworks for improved understanding in adolescent use of social media for seeking information related to sexual health. The main objectives of this article are, first, to examine the existing literature pertaining to social media, namely its main characteristics and uses by adolescents, its use as an educational tool, and its relation to health information; second, to explore information-seeking and learning through online platforms, particularly social media; and third, to provide a framework utilizing self-determination theory to better understand adolescent motivation in health-seeking behavior. This manuscript advances current knowledge and practices in supporting adolescent skill-development surrounding information-seeking and evaluation behaviors. Such practices will only become more beneficial as young people seek information in various settings (e.g., online, social media platforms, and artificial intelligence systems), particularly sensitive information such as that related to sexual health.

**Keywords:** sexual health education; health education; information-seeking; social media; adolescents; sexual health information; social determination theory



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## 1. Introduction

The ways through which adolescents seek sexual health-related information from the internet are vast yet ever changing, and social media platforms are increasingly becoming popular tools through which people seek information. Sexual health-related information is inclusive of topics pertaining to anatomy, reproduction, healthcare, identity, disease, sexual practices, and more. In order to better understand how and why adolescents seek sexual health information online or on social media, as well as inform understanding of their perceptions of sexual health on social media, this narrative review will explore multiple aspects of social media (specifically its characteristics and uses by adolescents, as well as its use as an educational tool and relation to health information), information-seeking (namely in online platforms, such as social media), basic learning theory, and self-determination theory, including how each might relate to proposed research focused on adolescent sexual health-seeking behavior.

## 2. Social Media

Social media is here to stay. As such, it is beneficial to examine how social media may be used as an educational tool, particularly when it comes to sexual health information-seeking and dissemination of sexual health information among adolescent populations.

### 2.1. Social Media as an Educational Tool

New inventions have led to increased advancements and the use of technology within the field of education (e.g., improved technology devices within the classroom, as well as advancements in personal electronic devices). Slide projectors and portable overhead projectors displaying transparencies have been replaced by smartboards and mounted ceiling projectors capable of Bluetooth connection. The first computers available in classrooms weighed nearly 25 pounds. Perhaps one or two computers were available per school. Initially, schools were often limited to one classroom of computers to be shared by all students. Today, many schools have portable iPads or Chromebooks for each student to use throughout the day. Similarly, social media platforms, once often used merely for personal communication with others, are now being recognized as educational platforms for instruction and outreach [1]. Social networking sites are also considered learning tools, e.g., [2,3], meaning tools that allow students, educators, and parents to collaborate online. The integration of social media tools in education systems supports both teaching and learning, as the use of social media platforms may assist with curriculum delivery and extend the learning environment into the real world, providing enriching learning experiences with real-life practice [4].

As an educational tool, social media has been used in a variety of fields by many professionals. In one study examining the use of social media as an educational tool and resource, 1503 healthcare practitioners (nurses, pharmacists, administrators, and physicians) were asked about their personal use of social media in the workplace. Of those who had social media accounts (more than 80% of participants), 43% reported using social media for educational purposes and 85% felt social media could be an effective educational tool [5]. The ways healthcare professionals use social media as an educational tool are by sharing and exchanging information with others (professionals and non-professionals), having chat discussions, following conference proceedings and highlights, obtaining live updates during medical procedures, training medical personnel, receiving healthcare agency alerts or communication during crises, practicing patient care and education, and administering public health programs [5–7]. The public health field has commonly used social media platforms in areas of health education and health promotion [8,9], such as nutrition interventions for adults and teenagers, diabetes education programs, e-cigarette education programs, and human sexuality programs [10–13].

Social media is also specifically used as an educational tool. This is apparent through a variety of examples, including teaching the English language, teaching geography, and providing assistance in writing [14–17]. Teachers are using social media as an educational tool, and they are doing so typically in secondary and higher education [17]. In reviewing the literature, Chugh and Ruhi [18] found that in 25 peer-reviewed studies focusing on the use of Facebook in higher education settings, educators used Facebook as an educational tool to enhance learning, increase participation and engagement, disseminate course content, improve pedagogy, and increase information sharing. Another example of social media use in higher education is Twitter (now X) being used as a tool to promote discussion with others and learning from others' experiences [14,15,19].

In investigating how social media use may facilitate learning and teaching, Chawinga [14] found that incorporating Twitter (now X) and blogs into undergraduate science courses at a public university led to greater spread of materials, course reflections, and interactions between students and their professors and that the classroom environment became available to them 24/7. Over the course of 12 weeks, 64 students shared more than 9000 tweets and the instructor shared 350 tweets. Group blog posts, comments, and related audio/visual content totaled over 500. Better online communication skills were reported by students (e.g., the limited character count used in Twitter encouraged students to learn to better summarize their words; [14]). To exemplify the use of Twitter in a geography classroom, Hundey [15] provided examples of learning objectives and specific tools used during a geography lesson, outlining a seminar discussing the uses of social media within the

university classroom. A handout was provided that specified social media tools and educational uses for students and teachers.

Li [16] examined English language learning among 122 university students in Hong Kong and the frequency of social media type used for learning English. It was found that YouTube was used both daily and weekly by 16.5% of respondents, followed by Wikis on a weekly basis. Students reported sharing information and materials for assignments with each other via social media and interaction with both teachers and other students, though greater student–student interaction occurred than student–teacher interaction. Facebook and WhatsApp also were the social media sites most preferred by students as unofficial English language learning tools [17].

#### 2.1.1. Web 2.0 and Social Media

The term Web 2.0, originally popularized by O’Reilly and Dougherty, is a conceptualization of a new or rebirthed internet [20]. As a term, Web 2.0 has been difficult to define, but generally, the literature indicates that from a user standpoint, Web 2.0 has two primary components: network effects and platform [21]. Network effects refer to the idea of products or services becoming more valuable as more individuals use them. Platform refers to a reliable, and possibly simple, environment for individuals to use as they wish. Platforms often include user-created data such as videos, photos, writings, and more [21]. Social media sites, synonymous with social networking sites, are inherently Web 2.0.

#### 2.1.2. Social Media Platform Types

Hundreds of social media sites exist, and new platforms are constantly in development [22]. Common types of social media platforms are categorized as social networking, blog comments and forums, microblogging, media sharing, book marketing, and social news [8]. Social networking platforms allow individuals to share and connect with others who have similar interests, backgrounds, or needs. Examples include Facebook, Instagram, LinkedIn, and Snapchat. Blog comments and forums are platforms where individuals engage with others via posting and responding to community messages, typically centered around one specific topic [8]. An example of a forum platform is Reddit. Microblogging, the shortened version of blogging, is meant for one-way platforms based in simple, written entries and sharing links, websites, or other social media. X (formerly Twitter) is a microblogging platform. Media-sharing platforms primarily allow for the exchange of multimedia like photos, videos, and audio. They often allow individuals to maintain community profiles as hubs for all of their created and shared multimedia [8]. Examples of media-sharing platforms include YouTube, Vimeo, and Flickr. Bookmarking platforms are categorized as sites which allow users to save, tag, and organize online content, resources, and external webpages for followers to easily find [8]. Pinterest and Mix are examples of bookmarking social media platforms. Social news platforms allow for rapid sharing of news and dissemination to web followers, often designated by popularity among other followers [8]. Social news platform examples include Digg and WikiLeaks.

Advancements in access to the internet, mobile technologies, and social media platforms have led to wide use of social media platforms for educational and research purposes, public health educational interventions, digital means of disease detection and monitoring, sharing health information, individual health information exchange, and self-management support [11,13,16,23,24].

#### 2.1.3. Marketing and Structural Design

Given the wide range of social media platforms and different usage purposes, social media has become a means of sharing information through many different forms. Various companies have used social media as a way to share information, specifically as a marketing tool. Marketing for education purposes via social media may be viewed as a way to create, strengthen, and enhance relationships with individuals interested in learning more about a product or service [25]. Using social media allows for easier engagement with students,

allowing another channel through which individuals may express their needs to those delivering content [25]. Marketing via social media also leads to increased brand awareness, access to a wider audience, targeted audience interaction or targeted sharing of material, promotion of products, and engagement with similar others [25].

One example of educational marketing is libraries within educational institutions using social media as a strategy to market the services they provide and connect with potential users [26]. A university library may use social media to showcase special collection items, to demonstrate use of interlibrary loan services, to market special events, and more. The use of social media in educational marketing has benefits and challenges. One of the elements to consider in educational marketing is time. Use of time is beneficial in that once established, social media channels quickly disseminate information. However, time also poses barriers as taking the time to utilize social media may take away from other focused work, particularly if social media accounts are not managed by an employee whose work is dedicated to social media production for the institution. Another element to consider when using social media for educational marketing purposes is knowledge. Staff must be trained in how to use social media sites and continuously be taught about newly developed, popular social media platforms (or updates to older platforms; [26]).

In addition to marketing, various structural design aspects of social media are used as educational tools in promoting content. Often, hashtags are utilized to flag material online that may promote education and research. Hashtags, easy to include in any social media post on various social media platforms, are used as educational tools to help disseminate information. One example of this is the use of #OrthoTwitter. In the course of one year, November 2018–November 2019, 5243 tweets were identified on Twitter (now X) containing #OrthoTwitter, ‘orthopedic surgery’, or ‘orthopaedic surgery’. Of all tweets using #OrthoTwitter (119), 87% were directly from orthopedic surgeons and 44% contained educational or research content [27].

## 2.2. Social Media Characteristics and Uses

There are numerous characteristics associated with social media platforms. A few are described here. Most social networking platforms are free of charge to the user. Individuals may connect with others with minimal to no financial burden. Many different types of services are provided via social networking sites, including email; instant messaging; chatting; and sharing of files, videos, or photos. These services allow for users to easily interact with each other [28]. Typically, social media sites also have some sort of database of users, allowing individuals to find friends, form groups and communities, and connect with others who share similar interests. Users may articulate their own social networks by creating online profiles with various privacy securities and requesting to follow or be friends with other users [28,29]. Social networks found in social media allow people to organize groups of support based in various interests and identities (e.g., interest in politics or music, and racial, sexual, or religious identities; [30]). The primary use of social media is to publish blogs (regular updates and/or conversational-style writing); share multimedia; message others; provide a space for conversation; provide tools for professional communication and collaboration; and provide professional, specialized (niche), or mainstream networks [8].

Social media platform characteristics may be influential when it comes to use and ease of use as an educational tool. Ease of accessibility and diverse options make the use of social media appealing in a variety of educational contexts [8,9]. Social media platforms are also used in different ways according to population characteristics such as age and gender [31].

### Social Media Usage

It should be noted that trends in adolescent social media use over the last three years have likely increased, particularly as a result of the COVID-19 pandemic. However, not all publicly available data examining adolescent social media use is up to date and sample size

may be limited (e.g., 1316 participants; [32]). What follows is an explanation of adolescent social media use based on currently available data.

Recent data indicate that over 95% of adolescents in the U.S. have access to a smartphone [32–36]. Upwards of nearly 50% of adolescents are online constantly, with most accessing the internet a minimum of one time per day [32–37]. Adolescents ages 13–18 spent an average of 8.5 h per day engaging with screen-based media in some way or another (television, computers, online videos, reading online, and social media) and nearly half of that time can be accounted for by time spent on mobile devices alone [38]. Social media networking sites are easily accessed through the use of mobile applications on smartphones.

Regular use of social media is common, with up to 93% of teenagers reporting they use it on a consistent basis and as much as just over 80% reporting daily use [38,39]. A near constant use of social media is reported by 35% of teens and 54% report using social networking sites multiple times per day [32,39]. In much of the U.S., the U.K., and Europe, more than two-thirds of young people are using social media for 3 h each day, and just over one fifth of adolescents are using social media for 5 h each day [33,34,40,41].

TikTok, Instagram, YouTube, and Snapchat are typically the most popular social media networks among teenagers and young adults [32,36,42,43]. Facebook, Twitter (now X), Tumblr, Reddit, Discord, and other social media platforms are also commonly used by adolescents [33,34,36,43].

### *2.3. Health Issues and Educational Interventions*

Most often, adolescents turn to their parents or trusted adults and friends for health information. However, adolescents also turn to the internet, including social media, to find answers to health-related questions [44,45]. Increasingly, the use of social media has become more common for youth and adolescents, and more and more frequently, youth are turning to the internet and social media platforms for information about various health issues [33,34,36,38,39,44,45]. With its creatively displayed information and portrayal of facts in eye catching and attractive ways, social media can be an influential, engaging, and motivational tool for adolescents interested in various health topics [46].

Interest in social media use as an educational intervention, particularly in the public health world of health promotion and health education, is not new [47,48]. Public health educational interventions (for both youth and adults) through social media have focused on diabetes prevention, sexual health promotion, promotion of physical activity, eating disorder prevention, and other health-related issues [11,49–52]. The use of social media in educational health interventions among youth and young adults is seen as providing a mechanism for individuals to actively engage with their personal health [53].

### *2.4. Search Engine for Health Information*

With adolescents experiencing greater access to technology and increased internet use, it is likely they are seeking health information online or on social media. Though the search engine aspect of social media has yet to be deeply studied by researchers across a variety of fields, examples of the dissemination of news information via social media [54], social media's influence in the domain of online tourism and travel search [55], and monitoring of social media posts and searches as a tool for prediction in facilitation of public health issues [56] all contribute to the importance of the need to study social media websites and applications as powerful search engines.

Adolescents frequently search for health information online [44,45]. Some of the health topics adolescents frequently search for are skin treatments (e.g., for acne), illness and disease (e.g., COVID-19), dieting, nutrition, alcohol, physical activity, sexual health, and mental health [39,45,46,57–60]. Teens also use social media as a strategy for accessing health information [39]. It should be noted that given the recent pandemic, it is likely that the number of adolescents searching for health information online has also increased [61,62]. Additionally, when compared to more traditional media sources (i.e., television, books, and



newspapers), Wartella and colleagues [44] found that under 10% of teens (of 1200 surveyed) reported obtaining health information from those sources rather than the internet.

As a tool, social media is a creative facilitator of health information and related issues [46], and one that provides its users a place to digitally socialize and connect with others [63]. These unique design features of social media platforms present information and invite connection with others in a way that is appealing to adolescents [64], making social media a health information tool unlike any other. Algorithmic principles built into social media also add to the uniqueness of social media as a health information tool [65].

### 2.5. Health Concerns and Benefits

In today's society, there are increasingly growing concerns over adolescent social media use and personal well-being. The recent Facebook whistleblower scandal has brought to light possible evidence that the social media companies may be more concerned with profit than with users' health and safety [66]. Along similar lines, a recent, popular documentary on Netflix titled *The Social Dilemma* [67] discusses various mental health concerns of adolescent users of social media platforms, the algorithmic principles of social media, and the copious amounts of misinformation shared daily on various social media platforms.

Generally, there is agreement that excess use of social media may lead to mental health concerns for adolescents, particularly increased depression, body image issues, and eating disorders [68–70], especially among adolescent girls [66,67,69]. However, there is public criticism and research which indicates mental health concerns may be both misplaced and overstated [69,71]. Mixed findings from studies measuring mental health outcomes in relation to social media use have pushed a growing body of work to focus on how social media use may relate to positive or negative effects on adolescent development and youth mental health, why those positive or negative effects may occur, and for whom [72]. Evidence suggests that how adolescents use social media, rather than time spent on social media, is a much more critical influence when it comes to various mental health outcomes [71].

Positive mental health benefits experienced directly or indirectly through social media use may promote individual well-being. Positive mental health benefits from social media use include opportunities for positive communication with others, identity exploration, humor and entertainment, and social connection [32–34,72,73]. Connection with others online has led to increased feelings of social support and decreased stress [74,75]. However, the quality of interaction and social support influences the feelings of connection to others online (e.g., [76]). Longevity of social media use may lead to indirect health benefits. In chronic disease patients, it was found that with longevity of social media use, individuals experienced gains in feelings of identity (choice and control in how individuals present themselves), flexibility (communication is up to individuals' personal timeframe), structure (social media structure can facilitate and guide individuals), narration (individuals get to narrate their own experiences), and adaptation (accommodation of individual needs and behaviors; [77]).

### 2.6. Digital Health Interventions

The increase in digital technology interventions coincides with the increased use of new means of communication, the internet, and social media, particularly in the health realm [78–80]. Close to 60% of the world's population uses the internet, and overall, individuals have experienced an increase of nearly 10% of time spent online per day in recent years [81]. An increase in the amount of time spent online is no surprise given the increase in online work and educational settings as a result of the pandemic. However, the number of social media users went up 13% in one year, totaling 4.2 billion current global users, indicating an overall increase in social media use [81]. Nearly 1 billion individuals have started using social media in the last 3 years combined [81]. In the U.S., 240 million individuals have at least one social media account—nearly 75% of the total population. Ninety percent of the US population uses the internet regularly [82].

Given the rapid increase in internet and social media users, it is easy to see why there has been an increase in digital technology interventions and digital health interventions. The development of digital technologies meant to positively support individuals' health is necessary for the current digital age, particularly for adolescents, given that most of today's adolescents do not remember a time without access to the internet [83]. As a result of adolescents' frequent use of the internet, the development of online and social media interventions has occurred more frequently in recent years to better things such as electronic health literacy, health promotion within social media platforms, and risky behavior such as excess drinking or smoking [45,60,84,85]. These examples are only a small sample of the type of social media health-based interventions that currently exist.

Health interventions based in social media and aimed at various mental health disorders have been increasingly popular in the last few years. As of 2023, an estimated 49.5% of adolescents have had a mental disorder [86]. More female adolescents than male adolescents have a diagnosed mental health disorder and more females than males receive treatment [86]. This is important because increasing numbers of individuals with mental health disorders are using social media, perhaps even at a higher rate than those without a mental health disorder [87,88]. In a sample of 80 youth ages 12–21 with diagnosed mental health disorders, 97.5% reported using social media and spending upwards of five hours online each day [89]. These statistics are slightly higher than general trends among all adolescents [32,33,38,39]. Instagram, YouTube, Facebook, and Snapchat have been found to be popular among adolescents experiencing mental health ailments [89,90]. However, TikTok has recently become quite popular, and nearly 33% of its more than one billion users are between the ages of 10 and 19 [91]. Thus, the likelihood of its use by adolescents with mental health disorders is high.

As a result of stigma associated with mental health disorders, as well as the difficulty in separating the connectedness between some physical health and mental health ailments, it is likely that estimates of adolescents with mental health disorders (diagnosed and undiagnosed) are low [92,93]. With upwards of 80% of teenagers using social media daily [38,39], and the negative health concerns of frequent social media use, particularly for adolescent girls [66,67,69], there is a need to understand the motivation behind adolescent social media use, particularly as internet and social media platforms are common sources of health information for adolescents and social media internet interventions are increasing [83,94].

The purpose of the use of social media by youth is dynamic and multifaceted. There is a need to develop further knowledge about adolescents' use of various social media platforms. This is evidenced by the work carried out by Shaw and colleagues, who found that between 2000 and 2014, 1010 peer-reviewed publications from six databases (CINAHL, Medline, Scopus, ProQuest, Psych Info, and Science Direct) had social media as the main subject. An in-depth analysis of three social media health intervention studies (of 104 qualifying from their sample) was performed and the results indicated that social media interventions had little significant impact on the primary outcomes and that the measures of social media intervention processes were weak [94].

### **3. Information-Seeking**

#### *3.1. Health Information-Seeking*

In order to better understand how adolescents seek and evaluate sexual health information on the internet, particularly information found on social media, it is beneficial to have a basic understanding of health information-seeking behavior. Lambert and Loiselle [95], in reviewing 100 published articles and 5 books about health information-seeking behavior, shared a description of the basic concepts of health information-seeking behavior. There is no single consistent definition of health information-seeking behavior, often only referred to as information-seeking behavior. However, a general consensus is that health information-seeking behavior is behavior relative to how individuals obtain information about their health, health topics, and health promotion activities [95]. This includes sexual

health. The reasons for seeking information, as well as search methods employed and the scope of search, vary from person to person and from one situation to another [95].

Some of the traditional reasons for seeking health information are coping with a health-threatening situations, medical decision-making, behavior change, and preventative behavior [95]. However, both the type and amount of health-related information sought varies. Other characteristics include variation in the actions taken to obtain information, as well as the sources used [95]. The characteristics of health information-seeking behavior can be summed into two main dimensions: information and method. Information refers to type (the content and diversity of information and its search) and amount (how much information sought), as well as its details. Method refers to the actions or processes individuals use to obtain information, including the sources of information used [95].

Online sexual health information-seeking behavior is complex. To begin to understand this complexity, a basic understanding of the factors influencing adolescent health seeking behavior and learning theory is necessary. The use of multidisciplinary conceptual frameworks as a basis for supporting investigations of health information-seeking is also useful [96]. Longo's comprehensive and integrated model for understanding health information, communication, and information-seeking [97] and self-determination theory, developed by Ryan and Deci [98], may be used in order to better explain the factors related to adolescents' thoughts, intentions, and strategies about seeking health information on social media.

### 3.2. Online Health Information-Seeking

It is well known that parents and peers (peers particularly for older adolescents) are key sources used by adolescents when accessing health information, particularly sexual health information [99–101]. However, the internet and social media sources are becoming increasingly more popular as a prominent source of health information for teens (e.g., [83,102,103]). In the U.S., many adolescents use the internet as their primary general information source for health topics. In a study using focus groups with 157 adolescents ages 11–19 in the U.S. and the U.K., it was found that among males and females, the internet was the primary source of information for searching [83]. Among 469 high school students in Croatia, online information was considered the main non-personal source of information, meaning not involving a parent or trusted other to ask directly [59].

Adolescents often search for health and sexual health information on social media relevant to experiences they may be having in their own lives. Logsdon and colleagues [103], in performing research with 185 adolescent mothers ages 13–18, found that this subset of young women preferred to search on the internet and social media for health information. The most reported health issues faced by these individuals were sexual health issues, sexual assault, violence, and depression, reported by 86.3%, 84%, 81.7%, and 79.2% of the sample, respectively [103]. Participants most frequently searched online for sexual health information related to pregnancy/birth control (85.8%), STDs (72.6%), and HIV (human immunodeficiency virus; 66.3%; [103]). Using focus groups, Havas and colleagues (2011) found that among 106 Dutch adolescents, ages 12–19, the majority of individuals in their sample searched online for information related to their own mental health problems and sometimes for ailments suffered by family and friends. Some of the youth had self-reported mental health problems while others reported their close relatives and peers had mental health problems [104].

Accessing accurate sexual health information online is a concern, particularly when it comes to the use of online materials and social media. Safety concerns exist pertaining to consumer health and the potential harm associated with using unsafe internet or social media content. In an analysis of 456 abstracts of research articles related to YouTube, five areas of safety concerns for consumers were identified with hopes of shedding light on areas of focus for designing future social media interventions about health [105]. They are harmful health material directly targeted at consumers (e.g., marketing of tobacco products); public display of unhealthy behavior (e.g., self-harm or hurting others); tainted



public health messages (e.g., anti-vaccine material); negative psychological impact from accessing inappropriate, offensive, or biased content; and use of social media to distort policy and research funding [105].

Source of online sexual health information is another area of concern related to consumer well-being. In examining health literacy to identify more strategies to address the knowledge gaps contributing to preventable illness, Chen et al. [106] found that in a sample of 600 participants in the U.S. ranging in age from 18 to 89, individuals with lower health literacy were less likely than those with higher health literacy to trust health information from specialists, such as doctors and dentists. They were more likely to trust health information from blogs, celebrity webpages, social media, television, and pharmaceutical companies [106]. Individuals with lower health literacy also had higher rates of using social media and blog sources than their counterparts with higher health literacy. This is concerning and important to note, as these sources may contain lower-quality health information compared to information from professional healthcare workers and webpages [106].

#### 4. Adolescent Motivation and Health-Seeking Behavior

There are a variety of factors that influence why an adolescent might seek out sexual health information. Though many variables exist and variable influence may change over the course of one's lifetime, some of the known factors influencing adolescent behavior to seek sexual health information are demographic in nature (i.e., gender, race and ethnicity, socioeconomic status, and education level), whereas others are more flexible (i.e., health topic, influential others, and presentation and design of information). A few examples of factors that might be related to adolescents' thoughts and behaviors with regard to seeking sexual health information online or on social media, as well as their intentions and strategies to do so, are provided.

##### 4.1. Demographics

Demographic factors influencing adolescents' behaviors and intentions in seeking sexual health information online include factors such as gender, race, ethnicity, education, disability status, sexual orientation, and socioeconomic status.

###### 4.1.1. Gender

Female adolescents are more likely to seek health information than their male counterparts [107–109]. The same holds true for online health information-seeking [108,110,111], and similar patterns continue into adulthood [112]. A meta-analysis of five different national health surveys from reputable centers such as the National Cancer Institute and the Pew Research Center involving responses from over 128,000 individuals (over 77,000 of whom were college students, i.e., older adolescents) about online health information-seeking found that females are more likely to seek health information online when compared to males [111]. It was also found that college-aged males were more likely than their older male counterparts to seek health information online [111].

###### 4.1.2. Race and Ethnicity

Race and ethnicity are influential in understanding adolescent health information-seeking behavior. Racially diverse adolescents (e.g., Black, Latinx, etc.) do access health information, but they do so typically less often than their racial majority counterparts; however, health information-seeking is generally high and increasing for all youth (e.g., White; [113–116]). Often, racially diverse individuals experience lower levels of trust in healthcare providers [117]. This may also influence lower levels of health-seeking behavior among racial minority adolescents.

Examples of racial youth groups utilizing the internet for health information-seeking are evidenced by the work of researchers investigating health information-seeking behavior among students of color. In one study, Okoniewski et al. [114] looked at a group of 32 adolescents ages 14–18, all students of color from impoverished areas in the Bronx,

whose daily use of the internet included looking up health information at times for both an immediate need for triage, diagnosis, and treatment, and a deferred need for health topics about which they were curious [114].

#### 4.1.3. Sexual Minority Youth

The use of social media or online sources as tools to access health information online is not limited to youth belonging to majority gender or race and ethnicity categories. Sexual minority adolescents (i.e., LGBTQ+ youth; lesbian, gay, transgender, queer, bisexual, asexual, and others) have been found to use social media or online webpages to access information about health and to do so often [113,116,118]. Research with 18 sexual-minority youth reported that all individuals used social media to look up information related to sexual health topics including gender identity, transgender support, and sexual healthcare topics [118].

#### 4.1.4. Socioeconomic Status

Adolescents belonging to a household with a low socioeconomic status may be less likely to seek health information. They may have less access to resources and education, which may help provide them with the tools necessary to properly obtain reliable health information [117]. Limited educational opportunities for adolescents may result in less health literacy and fewer opportunities to know, understand, and practice the skills necessary for analyzing health information and deciding if it is good-quality information that comes from a reputable source [119].

#### 4.1.5. Smartphone Access

Given that as many as 95% of teenagers have access to a smartphone [32–36] and that upwards of nearly 50% of teens are online constantly, with most accessing the internet at least once daily [32–37], it is likely that having a smartphone influences whether or not adolescents are accessing online health information. Many of today's adolescents might not even remember a time without access to the internet [83]. In a study involving 26 single-gender focus groups (male and female), it was found that among 157 adolescents ages 11–19 in both the U.K. and U.S., the internet was their primary general information source for health topics [83].

### 4.2. Development Status

Epistemic cognition, or knowledge about knowledge, relating to sexual health information is something that one must develop over time. Adolescents must actively construct their own beliefs about sexual health knowledge—it cannot be absorbed from what others say [120]. The ability to begin to develop one's own beliefs about the acquisition of knowledge corresponds with one's ability to think in new ways, coinciding with cognitive development that occurs during adolescence, such as thinking in hypotheticals, thinking in multiple dimensions, thinking abstractly, and using metacognition (awareness of one's own thought processes; [120–123]). The use of schemas may produce explicit metacognitive beliefs about how to produce truth [124], particularly in relation to health material found online. Schemas may be manifested as beliefs an individual holds, both implicit or explicit, and specify the means by which epistemic beliefs such as knowledge, understandings, or explanations are produced [124]. For example, an adolescent who knows the ins and outs of Instagram polling may be able to ask others' questions about their experience with the HPV (human papillomavirus) vaccine and use poll results in forming their own beliefs about the vaccine. People's schemas vary, and they may be either erroneous or accurate [124]. Generally, schemas guide investigative action one takes in determining beliefs [124]. Additionally, they are used to evaluate processes by others to produce knowledge claims, and they are used to generate explicit or metacognitive beliefs about how to generate true beliefs [124]. Another example may be as follows: in deciding on getting the HPV vaccine, an adolescent may believe the scientific processes and standards by which researchers and

vaccine developers are held to when developing vaccines are important for the production of a safe and effective vaccine. So, when she reads an article she sees on social media discussing the rate of vaccine development and the shortcuts scientists took to develop the vaccine, her confidence in the truth of the article is diminished. Therefore, the teen is using beliefs about a reliable process for knowledge growth to discredit inaccurate knowledge claims which failed to employ the reliable process itself.

In examining the ability of 57 middle-school-aged adolescents (ages 12–16) to detect the quality features of web information, Macedo-Rouet and colleagues found that most students failed to notice issues related to the presentation of high-quality information, such as topic match, author credibility, and up-to-date information [125]. In providing a justification for quality web information, adolescents said good web information provides a lot of information and that it matched their own opinions [125].

Identifying quality issues in information online may be a difficult task for adolescents [125,126]. This may be because of limited instruction but also developmental status. Younger adolescents, in particular, may not have the necessary cognitive abilities to actively participate in the critical thinking process or multi-dimensional thinking [123,127], influencing the way in which they process information. An adolescent's ability to be aware of high-quality information, access it, and use it to make health decisions or create a new belief—appropriately applying reliable processes to achieve epistemic ends [97,124], is in part determined by their ability to properly think about and process the information put in front of them. This ability is dependent upon cognitive changes which occur throughout puberty and adolescence [123].

#### 4.3. Information Processing

Related to cognitive development, information-processing skills typically increase as an individual transitions from childhood to adolescence [123]. In assessing the information reliability and relevance of 37 adolescents ages 14–17, Watson [128] found that in searching for and evaluating information online, teenagers often seek the least challenging ways to find information, relying on rankings of search engines and favoring first results. Adolescents did not understand the methods used by search engines to find something and often made decisions about relevance and reliability based on webpage article titles or URL elements rather than information provided within an article [128].

It is possible that in processing information, adolescents have limited literacy skills. In subjects such as health or science, individuals may not know how to properly read or interpret material or evidence that has been presented to them. Difficulty of text may lead to a higher acceptance of false information and rejection of true information [125,129]. For example, an article detailing the scientific steps to vaccine development and trial periods (such as how the HPV vaccine was developed) may appear overwhelming and use scientific terms not understood by the average teenager.

In examining eHealth literacy (electronic health literacy) in 455 unmarried youth in Indonesia ages 14–24, Nugroho et al. [61] found that in relation to the COVID-19 pandemic, 93% of the sample used their smartphone daily to access the internet (2021). Three-fourths of the sample searched for health information online specific to COVID-19 and healthy behavior via YouTube, other social media sites, and commercial health pages. Despite being able to access information online, more than half of the youth seeking online health information had low eHealth literacy skills and never confirmed the accuracy of the information obtained through discussions with professional healthcare workers [61]. Researchers claimed that eHealth literacy did not directly impact personal self-care health behaviors already in place but that higher eHealth literacy builds personal intentions to behave healthier [61].

In selecting and deeply understanding information, it is important that one has established criteria for judging the usefulness and quality of the information. For adolescents, the established criteria they use when processing information and where it comes from may be based on examples they have from trusted others and evaluations based on experience and

testimony from those individuals. It has been suggested that the influence of others impacts the foundation one sets for evaluating sources and information later in life [130,131].

Information processing may also be influenced by engagement with material, even at the physiological level [132]. In examining 48 seventh-grade students' physiological arousal, specifically the sympathetic activation system (fight or flight response) while reading separate webpages about the harm and benefits of genetically modified foods, researchers found that increased arousal and increased information-processing time lead to decreased comprehension of multiple conflicting texts. However, the interaction of prior knowledge with arousal was a positive predictor of comprehension of multiple texts, meaning that participants with higher pre-existing knowledge of the subject and increased processing responses experienced more comprehension of conflicting views about food [133].

Additionally, information processing may be impacted by the ways in which adolescents are seeking sexual health information. For example, the activation theory of information exposure posits that individuals seek information in ways that both stimulate and meet information needs [134]. Adolescents on social media may be less likely to apply information they see that is presented in a way they do not find entertaining. However, they may be more likely to use information they see that they also find entertaining or more arousing. For example, Donohew and colleagues [135] investigated media use and consumption among 114 individuals ranging from ages 14 to 86. The results suggested that different lifestyle types influence the need for information and the ways in which media consumption helps meet these needs [135]. Thus, adolescents who want information related to sexual health may process information they find not just useful, but also entertaining.

#### 4.4. Influential Others

Important people in an adolescent's life (i.e., influential others) may shape the need to seek sexual health information. Adolescents frequently report turning to their parents or other trusted adults (e.g., teachers, counselors, and older siblings) for health information and guidance [44,59].

Researchers in New Zealand found that in a sample of 68 students, ages 9–11, from 14 different schools with a variety of economic and ethnic backgrounds, influential others in the lives of early adolescents influenced their participation in online networks [136]. This included accessing social media sites such as YouTube, the way they accessed online content, how they participated with others online, and what they did with information they received online. Influential others were teachers, parents, older siblings, and cousins [136].

#### 4.5. Post Truth

One of the basic challenges in identifying misinformation is that there are many different specified realms or domains of knowledge, even about just one health topic [129,137]. Increasingly, there is wider acceptance and spread of false information, as well as increased misconception that in a digital world, everyone and every article can be considered 'expert' or that increased push of opinion, 'what feels good', matters over facts, data and evidence [130]. The ideas behind the question 'What is truth?' are decaying and the lines between opinion and fact are becoming increasingly more blurred [137], particularly in online and social media contexts [138] and the post-truth society in which we live [130].

In working with 162 undergraduate students who were on average 20.6 years of age, Alexander et al. [139] asked participants to graphically represent their understanding of knowledge, information, and truth; justify their representations; and define each term. The results indicated that the majority of respondents saw themselves as knowledge seekers, or truth seekers, as most defined knowledge and truth as an epistemic end [139]. This finding is encouraging when thinking about adolescents accessing sexual health information online. However, little is known about the efforts and intentions of adolescents to actively seek out the truth [139].

It is important to consider the challenges associated with a post-truth society in obtaining sexual health information online. Doing so sheds light on the unique difficulties of seeking information, even with intentions to actively seek out good information, use it, and make decisions [130].

#### 4.6. Social Media and Webpage Design

The passive receipt of information, based in social media algorithms, may lead to reception of false information [97,140]. Social media users have attempted to fight algorithmic social media feeds [141]. Despite this, algorithms are still used within various social media platforms, and sometimes, the algorithms misidentify the users or aspects of their identity [142]. This algorithmic misidentification can also be related to false information [140] as it may lead to exposure of sexual health information that may be true or beneficial for one group but not for another. Knowing this, it is easier to see how a teen accessing sexual health information online, such as seeking to gain accurate knowledge about the HPV vaccine and analyzing information sought through information from the FDA about clinical trials, may be the recipient of unintended health information [97] which may be true or false.

Algorithmic principles built into the design of social media influence the content that appears on the platform interface (e.g., which information appears first, order of content, type of content, ad preference, etc.; [140,142]). Internal ranking criteria of search engines, such as Google, or within social media sites, may also influence what type of content appears, particularly for health information [65]. One of the ways in which search engines and social media algorithms may be fed is through the use of hashtags. Hashtags also provide a way for social media users to look up information. Researchers in China analyzed the use of the hashtag '#COVID-19 Patient Seeking Help' on Weibo, a popular social media site in the country, to see how individuals used the hashtag to seek health information and what kind of information they were seeking during the peak of the COVID-19 outbreak in the country [62]. The '#COVID-19 Patient Seeking Help' hashtag was created for the purpose of use during lockdown for individuals to seek help online. In a twenty-day period, it was used in 10,908 posts on Weibo in connection to seeking help and support, accessing medical treatment, and managing self-quarantine [62]. The use of hashtags may suggest the information needs of populations using social media.

In reviewing 25 studies which analyzed adolescents' (ages 13–17) perceptions of health content about a variety of health topics on multiple webpages, Reen and colleagues [64] synthesized user preferences and difficulties in accessing and understanding health material. It was found that adolescents preferred interactive website features including games, images, audio clips, and animations. They also preferred social networking as a means to connect with others, view real stories, and hear testimonials. Difficulties in assessing and understanding health information included too much text, cluttered features, and difficulty of page navigation [64].

One of the typical features of social media is that it is made up of a variety of platforms in which users can digitally connect with others and socialize [63]. In looking at 70 university students' understandings of research findings about a newly introduced health topic presented in an online forum, Feinkohl et al. [143] found that individuals' feelings of tentativeness about findings were influenced by the comments of other users and that overall feelings of tentativeness about the topic increased as a result.

The unique designs of social media platforms, namely bright colors; sharing bits of information; videos; interactive social messaging; and, at times, limited number of characters or posts, make it appealing to adolescents [64]. The design aspects of social media and online webpages may influence the attitudes, intentions, or behaviors of an adolescent seeking sexual health information [67]. Algorithmic designs may also influence how adolescents go about finding health information—actively or passively [67]. Are they the recipient of information presented to them? Or are they actively using hashtags or other aspects built into the algorithm and interface designs to access information?



#### 4.7. Motivation

Given that social media platforms and online webpages have nearly an unlimited supply of information from which adolescents can select, it is crucial to think about the motivation behind adolescents' choices of what to search, how to search, where to search, and what to do with the information they find. Most acquisition of sexual health-related information online is performed in a self-regulated manner with users deciding, typically without guidance, which search engines or social media platforms to use; which comments or posts they prefer to read; and at which point to move on to other posts or comments, leave the platform, or switch to another [144].

Common reasons given for searching for information are curiosity, buying a product, fulfillment of a work or school responsibility, making a decision, and understanding law or regulation [145]. Each of the common reasons for searching for information may be applied to an adolescent searching for sexual health information online. For example, a teen may be searching for information about certain types of birth control (e.g., hormonal vs. nonhormonal—the pill vs. a condom) after learning about pregnancy prevention in health class.

Health topic is influential when it comes to adolescents accessing sexual health information. Generally, adolescents report seeking out health information related to nutrition, physical activity, disease, mental health, alcohol, and sexual health [39,45,46,57–60]. The topic of interest, typically due to lived experiences or experiences of close friends and family, is influential in an adolescent's motivation to seek health information [103,104].

Research has shown that curiosity plays a role in adolescents searching for sexual health information online. Data collected from 5542 adolescents ages 13–18 indicates that searching for health information online is common with 46% of heterosexual youth ( $n = 3380$ ); 81% of bisexual youth ( $n = 665$ ); 79% of gay, lesbian, or queer youth ( $n = 1282$ ); and 63% of youth questioning their sexuality ( $n = 225$ ) searching for any type of health information in the year prior to their participation in the study [146]. Searching for sexual health information online was also quite common, as 19% of heterosexual youth; 65% of bisexual youth; 78% of gay, lesbian, or queer youth; and 40% of questioning youth had also searched the web for information related specifically to sexual health [146].

#### 4.8. Affect

Affect may also be influential in adolescents' motivation for searching for sexual health information online. Research indicates that worry about health issues is directly related to online health information-seeking. In a study with 980 participants ages 18–91 who had, at one time or another, sought cancer information, it was found that worry was a direct motivator for online health information-seeking behavior [147]. Affect may also influence one's trust of information found online or on social media in that feelings about groups or individuals sharing sexual health information may influence what one decides to do with that information (e.g., engage with it or apply it). In evaluating the trustworthiness of health information online, researchers found that among 789 participants in Hong Kong, the U.S., and South Korea, averaging just over 20 years of age, expressed and unexpressed feelings of disclosure or openness felt from online sources and posts were associated with greater levels of trust of information found in social media [148].

#### 4.9. Trust

Trust might also influence sexual health information-seeking. Trust in the information source may influence how one seeks out information and the use of information found in an online setting. However, in a recent review of 22 articles (from 2003 to 2016) examining the role of trust in adolescents' search for health information online, as well as its appraisal, researchers found that teenagers ages 13–18 generally distrust health information online but continue to use and apply it anyway [149]. Continual use of health information found online was perpetuated by factors such as ease of use and ease of comparison of multiple viewpoints (when compared to traditional information media sources; [149]).

## 5. Learning from Social Media

The following section introduces the different types of learning that may occur when using social media. Additionally, Longo's comprehensive and integrated model for understanding health information, communication, and information-seeking [97], and self-determination theory [98,150] are explained in detail, providing increased understanding of both theories, helping to frame research aiming to better comprehend adolescent sexual health information-seeking behavior online and on social media.

### 5.1. Types of Learning

Social media can be viewed as an educational tool with varying aspects of formality and informality. To some degree, it is improbable to separate the ideas of formality and informality within learning. Rather, it may be more beneficial to look for attributes of formality and informality present in all learning situations [151]. Attributes of both formality and informality in learning within participation in social media platforms may exist [152]. As an adolescent seeks to navigate social media in attempts to learn more about various sexual health issues, formal and informal learning may take place.

#### 5.1.1. Formal Learning

Formal learning within social media may be defined as learning that occurs under the instruction or tutelage of some type of management agent such as an instructor, a parent, an educational program (e.g., educational software program or specific learning program), or learning management system [152]. In formal learning situations, the management agent traditionally guides an individual through traditional sets of objectives previously chosen and mandated by an outside authority. Examples include learning curriculum standards set by the government or professional organizations [152]. Formal learning is only a small portion of all of the learning experienced by an individual [153]. Educational aspects of social media are difficult to incorporate into existing formal learning settings. For example, given the nature of the set up of schools and other learning institutions, social networks are limited generally to teachers and students present in one classroom or learning group [154]. Limited social networks within learning limit opportunities to share content with others and learn from the masses. Traditional measurements of student learning and skill development are difficult to assess through social media use as learning via social media is often a large-group social learning process rather than individual or small group learning activities [154]. Research assessing learning via social media most frequently focuses on single aspects of social media use within learning (i.e., users, social media platform, and content) rather than the interconnectedness of groups on social media (i.e., groups of friends or similar interest groups).

After investigating young people's health-related learning through social media, Goodyear and Armour [155] suggested that for formal learning opportunities, co-construction and collaborative teaching practices involving students and teachers may be beneficial in improving and developing the digital skills and knowledge related to social media use, particularly for health-related topics. The use of social media by adolescents is both complex and dynamic. Greater knowledge and more research are needed to investigate formal learning via social media platforms, particularly if learning is applicable to students' personal experiences.

#### 5.1.2. Informal Learning

Informal learning with social media can be described as learning that is not externally mandated or directed by an outside source, such as a school or teacher, but learning that is internally controlled (e.g., [156,157]). This means the learner is in control of their learning and learning is typically self-directed, spontaneous, or exploratory by nature (e.g., [158,159]). A learner may have self-set learning objectives in mind and actively seek out information from sources they believe may help them meet their objectives. Examples include parents, teachers, trusted adults, peers, mentors, or media [152,160]. Informal

learning may occur in many spaces, including within or outside a classroom, and it is often thought to occur in a manner that is interlinked with formal learning, as the two can, at times, be difficult to distinguish [158,161,162]. Adolescents' use of social media is generally unstructured, conversational, and driven by users' interests [154].

Informal learning via social media affords adolescents the opportunity to investigate their personal interests at their own leisure. They may do this by pursuing information alone, or with friends, about risky health information or health groups within the seemingly private realm of social media platforms, away from the eyes of adults [163]. Social media provides adolescents relatively private spaces to learn about various health topics they may not be comfortable discussing with others such as physical activity, body image, diet, nutrition, sexual health, drugs, alcohol, mental health, and others [44,155]. An increase in individual-led informal learning through social media platforms may lead to increased access to inaccurate, or even inappropriate, sexual health information.

Some organizations working with youth, such as schools, have existing policies or practices meant to promote digital citizenship and safe online practices. Goodyear and Armour [155], when working with teachers, students, and community workers from 10 different schools in the U.K. from 2016 to 2017, including 135 adolescents ages 13–18, found that students felt current policies promoting online safety were outdated and irrelevant to their personal experience and use of social media.

One of the benefits of informal learning through means of social media is the opportunity of users to share information with each other. Easily built-in communication methods in social media platforms (e.g., instant messaging, commenting, liking, re-posting, tagging, story sharing, live streaming, etc.) lead to the relatively easy exchange of information and resources [164]. Learners are able to decide when, how, and how often to interact with others based on their own interests and desires. Another benefit of informal learning via the use of social media platforms is that in constructing and managing their own social media profiles and content, as well as engaging with the content of others, adolescents are provided the opportunity to learn and refine skills for their own personal identity and their personal brand of who they want to be and who they see themselves as [165,166]. This self-led identity improvement has implications for organic learning and ideas about health. Organic learning, implicit learning arising through experiences arising naturally in everyday life (i.e., adolescent participation in and use of social media), occurs as adolescents participate in self-reflective experiences and learn about the experiences of close friends and contacts through observation of others and common communication [167], all of which can occur on social media platforms. Young people get their ideas about health from living life [167]. Living life means watching other people, conversing with others, and having a variety of experiences, all of which may happen while participating in social media.

## 5.2. Longo's Comprehensive Model

Applied to understanding sexual health information-seeking, Longo's comprehensive and integrated model for understanding health information, communication, and information-seeking [97] incorporates aspects of passive information-seeking, meaning the obtainment of health information not actively sought, whereas other models of health information-seeking do not (e.g., the Comprehensive Model of Information-seeking [168] and the Planned Risk Information-seeking model [169]). The consideration of passive receipt of information is important when considering adolescents' thoughts and intentions regarding seeking sexual health information, as the algorithmic aspects of many social media platforms (e.g., Facebook, Instagram, and TikTok) may present individuals with sexual health information without their active, intentional search of it [140].

Developed as a way to better understand patient and consumer desires for health information, Longo's comprehensive and integrated model for understanding health information, communication, and information-seeking [97] can be applied to various situations in which an individual is seeking out sexual health information. It also provides representation for instances where an individual is not intentionally seeking health information but

may come across it, acknowledging both active information-seeking and passive receipt of information [97]. An adolescent may not intend to seek out sexual health information while using social media. However, as they scroll through feeds, they may come across it. Thus, receiving sexual health information can become an unintended part of daily activities.

The first part of Longo’s model focuses on the variables influencing consumer phases of information-seeking behavior and information use [97]. Both contextual and personal variables influence information-seeking behavior and use. Examples of contextual variables include healthcare structure, care delivery, information environment and accompanying factors, and the person for whom someone may be seeking health information (i.e., self, family, or friend; [97]). Examples of personal variables include demographics; socioeconomic factors; education; attitudes; intentions; behaviors; and health factors such as current health status, personal medical history, family medical history, and genetics [97].

The second part of the model examines the phases of information use and breaks into two connected parts: active information-seeking and passive receipt of information. All references to information, i.e., awareness, reception, access, and use, are defined in or through traditional mass media (e.g., books), new media (e.g., internet or social media), and personal interactions [97].

Active information-seeking has a series of seven points in the phases of information use (see Figure 1; [97]). A study of the model suggests the phases of active information-seeking can be categorized into three groups: awareness and access, use, and health decisions. Awareness and access relate to a consumer not being aware of available information, being aware of available information but not attempting to access it, or being aware of available information and attempting to access it. Use refers to a consumer accessing information and either being able to use it or not being able to use it. Finally, health decisions can be understood by a consumer accessing information and using it to make personal healthcare decisions or not using it to make personal healthcare decisions [97].

<b>Active Information-Seeking</b>	<b>Passive Receipt of Information</b>
Consumer:	Consumer:
1. Not aware of information	1. Does not receive information
2. Aware and no access attempt of information	2. Receives information
3. Aware and attempts to access	3. Receives information and does not use
4. Access but unable to use	4. Receives information and uses
5. Access and able to use	5. No use of information to make decision
6. No use of information to make decision	6. Use of information to make decision
7. Use of information to make decision	

**Figure 1.** Information-seeking based in Longo’s model [97].

Passive receipt of information is broken into a series of six points in the phases of information use (see Figure 1; [97]). The categorization of passive receipt of information may fall into three groups: reception, use, and health decisions. Reception relates to consumers receiving or not receiving information. Use refers to consumers receiving information and either using or not using it. And lastly, health decision is in reference to consumers

receiving information and using it to make personal healthcare decisions or not using it to make personal healthcare decisions [97]. The third and final part of Longo's model [97] is consumer outcomes. Outcomes include empowerment or locus of control, satisfaction, daily living activities, and health outcomes [97].

### *5.3. Longo's Model Applied*

Demographic variables influencing the behaviors and intentions of adolescents in seeking sexual health information online or on social media are variables which influence the phases of information-seeking behavior and use [97]. Demographic factors are personal factors which may interact with contextual factors, such as health status, to influence active information-seeking or passive receipt of information [97]. For example, given what can be found in the literature, an adolescent female is likely to actively seek health information online. The aims she uses in seeking health information may vary, but given the research, we know she will most likely have specific goals and objectives in searching for information [124], such as finding out information to build her knowledge of feminine hygiene products to determine which one(s) she should use.

Epistemic cognition beliefs influence the processing of information and what individuals decide to do with that information once it is received [97]. The ability to accurately process information, including how to properly access and judge information sources, how to appropriately read and comprehend the information presented, and how to take that comprehension and apply it to life situations or decision-making, may ultimately influence personal intentions and behaviors or actions taken in one's life [61,97,129]. The model presented by Longo [97] can be argued to be a model of information processing. The ideals, or standards, used to judge information and the ways in which one obtains information result in a process of information-seeking, how one uses information sought or received, and what one does with that information [97].

Influential others in an adolescent's life may guide and impact the attitudes, intentions, and behaviors they have in seeking information online [97]. This includes the reasons one has for seeking out information in the first place, and also their standards for reaching or satisfying needs. The methods used to satisfy needs may also be influenced by an adolescent's view of someone they see as influential in their life. If a parent or teacher expresses opinions about the best way to go about seeking or judging information in an online setting, adolescents, particularly young adolescents, may be more likely to practice those methods while searching for answers to their questions.

The various motivations behind an adolescent's purposes in searching for sexual health information online or on social media play a role in the various phases of information use proposed by Longo [97]. Attempting to access sexual health information; using it, if able; and applying information accessed in making personal healthcare decisions—all in relation to actively seeking out information—are influenced by the ways in which adolescents access sexual health information, why they are accessing it, how they feel about the information found, and what they do with it. It is similar for passive reception of information [97], as an adolescent who receives information when not actively seeking it must decide what to do with that information, if or when to use it, and possibly apply it to healthcare decisions.

Using Longo's model to study social media communication about the HPV vaccine on Weibo in China, Jiang et al. [170] examined social media information type and acquisition patterns. Over 67,000 postings about HPV on Weibo were examined by topic. A separate online survey of 1982 participants (mean age 36.9) investigated how scanning, seeking, or discussing HPV vaccine topics might affect associated HPV vaccine knowledge, safety concern, and vaccination intention. The results extended information type and use related to health information-seeking and Longo's model for understanding health information, communication, and information-seeking [97,170].



#### 5.4. Self-Determination Theory

Self-determination theory (SDT) is a broad theoretical framework for understanding factors which influence intrinsic motivation, extrinsic motivation, and psychological wellness [98,150]. As an organismic theory of human development and wellness, SDT has strong implications for education as it assumes individuals are inherently likely to experience psychological growth and integration, thus moving toward connection with others, as well as learning and mastery [150]. The growth and integration people experience are not typically sought through automatic proactive human behavior. Supportive conditions must be met for growth to occur. For healthy development, individuals need supports for basic psychological needs, namely autonomy, competence, and relatedness [98,150]. A lack of any of the three basic needs may be damaging to wellness and motivation [150]. Simply put, SDT distinguishes between intrinsic and extrinsic motivation and proposes that the support of three psychological needs, namely autonomy, competence, and relatedness, can positively impact wellness and therefore positively promote growth and learning [98,150].

##### 5.4.1. Autonomy, Competence, and Relatedness

Autonomy refers to an individual's personal sense of ownership and initiative in their actions—personal ability to direct choices, actions, and outcomes [150,171]. Supports for autonomy include experiences the individual finds of interest and value [150]. Autonomy is hindered by experiences of external control, including rewards and punishment [150].

Competence relates to an individual's feelings of mastery and their personal sense of being able to succeed and grow, as well as confidence in abilities [150,171]. Supports for competence include well-structured environments which provide optimal challenge, positive feedback, and growth opportunities [150]. Competence may be hindered by a lack of structured environments for change, negative feedback, and a lack of growth opportunities [150].

Relatedness refers to an individual's sense or feeling of belonging, value, and connectedness to others [150,171]. Supports include the conveyance of emotional support, such as respect, caring, and group acceptance [150]. Relatedness may be hindered by a lack of emotional support and ostracism [150].

##### 5.4.2. Motivation within SDT

Self-determination theory contains a number of sub-theories, each attempting to shed more light on influences affecting SDT's theoretical ideas concerning motivation. One, cognitive evaluation theory (CET) focuses on intrinsic motivation processes within SDT [172]. Another, organismic integration theory (OIT) centers on extrinsic motivation processes [98,172].

##### 5.4.3. Intrinsic Motivation

Intrinsic motivation, defined as the expression of active, integrative tendencies in human behavior; is assumed by SDT; and pertains to activities performed for inherent interest and enjoyment of the activity [150,171]. CET aims to specify factors which may explain the variability in intrinsic motivation from person to person or for one individual from activity to activity [172] and focuses on the need for competence and autonomy [98]. A core tenet of CET is that social-contextual events, such as feedback, communications, or rewards, may lead to feelings of competence while performing actions that may enhance or strengthen intrinsic motivation for those actions, and similar activities [98]. The main principles put forth by CET include individuals seeking out tasks in order to satisfy the need to be competent and self-determining; individuals wanting to feel agency in decision-making; individuals experiencing too difficult of a challenge, possibly abandoning efforts; and those experiencing too easy of a challenge perhaps seeking out more difficult ones, and that intrinsic motivation decreases when individuals believe their engagement in tasks or actions is extrinsically motivated [98,172].

Explaining the variability in motivation from one person to another, or from one activity to another for the same individual, CET may help to explain why adolescents' behaviors and intentions in seeking sexual health information online or on social media platforms may differ from person to person, from one social media network to another, or even by health topic. CET relates to the need for autonomy and competence [98]. Contextual events or experiences related to searching for sexual health information may be characterized within the social nature of social networking platforms. Intrinsic motivation may increase or decrease given contextual factors surrounding sexual health information seeking. These factors may be cognitively evaluated differently by each individual. This cognitive evaluation may impact psychological wellness in different ways from person to person. Keeping CET principles of SDT in mind while evaluating adolescents' motivations, desires, and actions in seeking sexual health information on social media will allow for a greater understanding of specific intrinsic motivational factors among adolescents seeking sexual health information online. It may also open up channels of generalities in understanding motivation to seek sexual health information online by specific groups of adolescents (i.e., groups according to sex, race, health ailments, diagnoses status, etc.).

#### 5.4.4. Extrinsic Motivation

Extrinsic motivation can be defined as the expression of behavior performed for reasons other than one's inherent enjoyment or activity satisfaction [150]. SDT assumes four major subcategories of extrinsic motivation: external regulation, introjection, identification, and integration [98,150], which explain a possible process of extrinsic behaviors ultimately becoming intrinsic. This theoretical process is known as OIT [98]. The core tenets of OIT include a continuum through which extrinsically motivated behaviors may eventually become internalized and intrinsically motivated, the process of how individuals may acquire the motivation needed to perform extrinsically motivated tasks, and that individuals performing tasks may move along a continuum from being amotivational to extrinsically motivated and ultimately intrinsically motivated [98,172]. External regulation is exemplified by external control; very little autonomy; and the saliency of extrinsic rewards, punishment, compliance, or reactance [98,172]. Introjected regulation is typified via some external control, ego involvement, and approval from self or others [98,172]. Identified regulation can be classified through some internal control, utility value of activities, and personal importance or relation to goals [98,172]. Lastly, integrated regulation can be characterized by high autonomy, high self-regulation, internal and external synthesis of goals, and congruence to sense of self [98,172].

According to SDT, the continual process one can experience of an extrinsic behavior becoming an intrinsic behavior represents OIT [98]. The motivation behind an extrinsically motivated behavior, such as searching for menstrual product information online for a friend who asked for some help, may eventually become intrinsically motivated as an individual begins to search for menstrual product information for that friend because they want to do it, or they find the topic interesting and keep investigating it purely because of personal interest in their own use of menstrual products. Understanding the principles of OIT in learning about adolescent sexual health information seeking behavior is important as it promotes the idea that the motivation influencing the use of social media in searching for sexual health information may change. Initially, there may be an extrinsic motivator in adolescent sexual health-seeking behavior, but eventually, the motivation influencing that behavior may become intrinsic.

## 6. Motivational Theory and Health Information-Seeking

A variety of motivational theoretical perspectives have been used to help better understand adult motivation in seeking health-related information, particularly in online settings [96,173]. Examples include self-determination theory (e.g., [174]), diffusion of innovations theory (e.g., [175]), gratifications theory (e.g., [176]), and the theory of planned behavior (e.g., [176]). The following paragraphs will provide some examples of various

theories of motivation which have been applied as frameworks or discussed as justifications and explanations of findings related to adolescent health, health-seeking, and sexual health-seeking behaviors.

Lee and Lin [174] used SDT as a basis in understanding health information-seeking online behavior. They found that the practice of seeking health information online greatly supports individuals' experience of increased autonomy, competence, and relatedness when compared to the practice of face-to-face office visits with physicians [174]. This was the case among a sample of 993 online health information seekers in India, ranging in age from 18 to 65 (mean age 29.26). Among this particular sample, support for autonomy and relatedness were found to explain why individuals seek health information online [174]. Although this particular sample is not made up solely of adolescents, the findings may carry over from the adult populations to adolescents.

The basis of the theory of motivated information management (TMIM) is analyzing the relationship between information management and uncertainty, or rather, state of being in terms of knowledge level (knowing, not knowing, and needing to know; i.e., information management) and actual or desired uncertainty [177]. Jayasundara [178] used the TMIM as a framework for investigating the influences in adolescents' sexual information-seeking behavior and their satisfaction felt with the information found. In investigating sexual health information-seeking behavior among 128 adolescents in Sri Lanka, average age 18, it was found that the findings validated the TMIM framework, particularly the negative relationship between anxiety and efficacy in obtaining accurate and good-quality sexual health information [178].

The Andersen behavioral model (also known as the Andersen healthcare utilization model) aims to understand the use of health services, determined by predisposing and enabling factors, as well as need [179,180]. Pescosolido's network episode model (NEM) proposes that attitudes of help-seeking are rooted in a person's social network, influencing the identification of problems and the actions taken to address them [181]. Both models are considered to be well-known models of help-seeking behaviors and health service utilization. Barman-Adhikari and Rice [182] developed their own model based on the models of Andersen and Pescosolido to use as a conceptual framework in studying sexual health information-seeking among runaway and homeless youth. Their findings indicated that among 169 homeless youth in L.A. (mostly male youth of color, average age 20.9), most regularly used the internet (54%) and were sexually active (81%), and that sexual health information-seeking was related to receiving online health information from someone they knew [182].

Protection motivation theory (PMT) proposes that people protect themselves based on threat and coping appraisal [183]. Goonawardene and colleagues [184] used protection motivation theory to explore how community-based healthcare websites might influence adolescents' behavioral intentions of health self-management. Using PMT and other concepts, they developed their own model of four influential factors (perceived threat, perceived empowerment, attitude toward the website, and privacy concern) on intentions toward self-managed healthcare [184]. Among 120 undergraduate students ages 17–20 at a university in Singapore (limited demographic information about participants is given), it was found that empowerment and attitude toward websites and privacy concerns predicted adolescent health self-management behavior and that perceived health threat interacts with other factors to influence intention toward self-managed health [184].

Though not related to health information-seeking, Pretorius and colleagues [185], in performing a systematic narrative review of 28 studies regarding young people's online help-seeking and mental health behavior, found that only four studies assumed any type of theoretical framework for study design (i.e., [186–189]). The theoretical frameworks were limited to Rickwood's help-seeking model [190] and the theory of planned behavior [191].

### *6.1. Advantage of SDT in Understanding Adolescent Motivation in Health-Seeking Behavior*

Most of the research about health-seeking behavior involves adults and not adolescents. Also, most of the research conducted on adolescent health information-seeking behavior is not built around a strong, theoretical framework. One of the advantages of using SDT as a motivational theory for understanding adolescent motivation related to online sexual health-seeking behavior is that it has not previously been studied with young adolescents. Jayasundara [178], Barman-Adhikari and Rice [182], and Goonawardene et al. [184], though focusing their research about health seeking behaviors in adolescents, focused on older adolescents, typically ages 17 and above. More research is needed that investigates adolescent online sexual health information-seeking behavior among younger adolescents, such as middle school students.

A review of the literature indicates that there is limited use of motivational theory and theoretical principles as a framework for research study and design investigating adolescent sexual health-seeking behavior within the field of educational psychology. This holds true for online settings and online health information-seeking behavior. Given the explosion of the number of social media users in the last few years, as well as great increases in the amount of time adolescents spend online each day, access to smartphones, the number of social media platforms and online webpages, as well as the increased interest in research on social media and adolescent health outcomes, it is critical to understand the motivation of adolescents to use and access the internet and social media.

In the coming years, it is likely that there will be even more social media platforms than there are today. It is also likely that more webpages and social media posts will be used and developed as ways to share sexual health information. It is probable that webpages, social media platforms, and posts will also be increasingly used as tools to search for sexual health information as the popularity of social media use increases among teens as a way to seek the specific sexual health information they feel they need.

Previous theory that has been used to examine adolescent health information-seeking behavior (e.g., the theory of motivated information management, Andersen's behavioral model for understanding health services, Pescosolido's network episode model, and protection motivation theory; [178,182,184]) has focused on understanding the aspects of adolescent motivation about health information-seeking. For example, TMIM focuses on information management and why one might choose to learn more or stay stagnant in what they already know. It does not help understand multiple variables which might influence motivation behind choosing to learn more, how one goes about learning more, or for what reasons one may be learning more. Frameworks built in SDT can help understand the why, how, and reasons for health information-seeking.

Analyzing adolescents' purposes and use of social media and the internet as a sexual health-seeking information tool through the lens of understanding adolescent needs and needs satisfaction will help lessen the current gap in the literature about the motivation behind adolescent sexual health information-seeking. Using SDT as a framework, specifically investigating adolescent sexual health information-seeking on social media via the lenses of autonomy, competence, relatedness, CET, and OIT, will open the doors to beginning to understand the unique motivating factors influencing adolescents' sexual health information-seeking behavior. Doing so will allow for future research in comparing adult and adolescent sexual health information-seeking behavior and perhaps more targeted online sexual health interventions for adolescents—interventions that are built around knowledge backed by theory specific to adolescent motivation and behavior.

### *6.2. SDT Framework for Adolescent Online Sexual Health-Seeking Behavior*

Though one might interact with others via the internet and social network platforms, participation in social media is often an activity performed individually. Joint social network accounts are limited and typically shared among married couples [192]. As an approach to understand human motivation and personality [98], SDT is strongly suited for understanding individual behavior. Given that innate psychological needs are the basis

for individual self-motivation leading to action [98,150,193], the adolescent use of social media or online sources for seeking sexual health information is likely tied to psychological needs. SDT has psychological needs as its basis in understanding motivation. A need for autonomy, competence, and relatedness influence motivation and, ultimately, behavior. This is true of adults and adolescents alike. Scientists have used SDT to examine sexual health information-seeking among adults. They have rarely used it to examine the same behavior among adolescents.

Adolescents' psychological well-being and wellness may be affected both positively and negatively by internet and social media use [194]. The implications of SDT that individuals will experience psychological growth and integration when learning [150] can be applied to social media and internet use in that participating in online social networking sites may lead to psychological growth and increase in wellness, or the opposite [150,194]. With an understanding that psychological wellness is influenced by intrinsic and extrinsic motivational factors influencing behavior, the following sections will describe ways in which SDT may be utilized as a framework to explain adolescent motivation to acquire sexual health-related information online and through social media.

### 6.2.1. Autonomy

Similar to adults, adolescents experience a variety of health ailments. They have questions about health topics and health issues they personally experience or those experienced by close friends and family [104]. It is already known that many teens use social media to access health information (87%, as determined by Rideout and Fox [39]). However, little is known about why adolescents are accessing health information via social media. Is it intrinsically or extrinsically motivated? Do they do it so they can have knowledge about a subject? Do they do it because someone asked them to look up information for them? Do those who turn to online social networks intrinsically for health information do so because of ease of access? Because they can have control over their choices in using built in search tools on social media (e.g., hashtags, algorithms, and influencers' posts)? Or because they feel like they can take charge in finding specific information they are looking for or want to find? The motivation behind the answers to these questions influences psychological well-being and behavior. Understanding the possible influences in adolescents' search for answers to questions related to health information-seeking online, combined with the fact that autonomy in SDT refers to personal ability to direct choices, actions, and outcomes, demonstrates that SDT will be a beneficial framework for understanding adolescent motivation to acquire sexual health-related information online.

### 6.2.2. Autonomy: Relation to Sexual Health

In relation to sexual health, autonomy can be aligned with an adolescent's decision to be sexually active and their beliefs about engaging in sexual behavior. The motivation related to engagement in seeking health information about sexual health online or on social media is likely connected to personal decisions about individual sexual health. Adolescents may search for information related to sexual health to satisfy a need to make a decision related to when to engage in sexual behavior. This shows initiative and ownership over actions, as well as the ability to direct one's own choices, actions, and outcomes.

### 6.2.3. Competence

Knowing where and how to search for information may be influential in motivating adolescents to seek out health information on social media platforms. Related to feelings of mastery and personal sense of success, growth, and confidence in one's abilities, competence is a strong motivating factor in influencing behavior [150,171]. Adolescents generally enjoy the layouts and designs of online social media platforms [64]. Bright colors, videos, and interactive features may make social media platforms more appealing as a source of general health information when compared to more traditional information sources (e.g., books and physicians). Adolescents may have little confidence in their ability to ac-



quire knowledge in a book, especially one with medical information, particularly given the digital age they have grown up in (e.g., [83]). Also, they may not feel comfortable talking to a physician they see once or twice a year. However, adolescents may be comfortable with using social media platforms as search tools given that up to at least 93% of teens report using social media regularly [38,39]. Motivation related to adolescent competence in searching for health information may be influenced by feelings of competence in using preferred social media sites. A general understanding of the questions related to adolescent health information-seeking online (i.e., preference, ability to search for information, etc.) will be strengthened by investigating adolescent psychological well-being through the lens of SDT competence factors such as personal sense of success and growth, confidence in ability, and structured environments [150]. This may be particularly true within the realm of sexual health.

#### 6.2.4. Competence: Relation to Sexual Health

Relating to sexual health, competence may be connected with an adolescent's feelings of self-efficacy associated with sexual behavior. For example, feelings of refusal self-efficacy (i.e., saying no to engaging in sexual behavior) or condom negotiation efficacy (e.g., talking through the use of a condom with a partner) may be influenced by motivation to feel competent or succeed in refusing sexual advances or negotiating condom use in a situation where the need may arise. Engagement in seeking out information related to sexual health may be motivated by the need to master how to talk about tough situations with a partner, or how to compromise, or the need to feel prepared to be able to talk to a partner about sex. Searching for sexual health information on social media may relate to feelings adolescents have in wanting to be confident in their abilities and perhaps have successful romantic relationships.

#### 6.2.5. Relatedness

Social networking platforms have built-in opportunities to connect with others. Connection with others is one of the reasons adolescents enjoy social media [64,195]. Relatedness refers to connecting with others. Specifically, it can be described as one's feeling of belonging, value, and connectedness to others and the need to establish emotionally close bonds and attachments [150,171,196]. Through the use of social media, adolescents may feel close to individuals they know personally and to people they have never met. Social media connections may allow opportunities for adolescents to authentically relate to others and possibly internalize any values endorsed by those they interact with via social networking sites [195]. In searching for health information online, this may be exemplified by adolescents searching for health information to share in their personal tweets, stories, snaps, or posts to promote their connection with others. One example is adolescents sharing information about proper social distancing guidelines in order to show others they are socially responsible [197]. Adolescents may also be searching for health information to understand the health ailments suffered by those they know personally, or if they have a health condition, to connect with others experiencing similar things (e.g., [104]). Individual desires and needs to belong may also influence an adolescent's actions to seek out health information or health groups on social media [72]. Using SDT's principles of relatedness while investigating adolescents' purposes and motivations in relating and connecting to others while seeking health information online or on social network platforms will provide a greater understanding of the type of sexual health information adolescents seek online and for what reasons.

#### 6.2.6. Relatedness: Relation to Sexual Health

Relatedness, in connection with sexual health, may strongly connect with an adolescent's feelings of connection to friends, parents, and partners. This could be in relation to parents' ideals taught to teens about when to engage in sexual behavior. It could also be in relation to friends' opinions or experiences with sexual behaviors or general feelings

amongst groups of peers, such as classmates in school. An adolescent may be likely to seek out information on social media about sexual health topics if friends are discussing those topics. This could be due to curiosity about the topic to be able to add their own voice to the conversation or to feel value in relating to others to not be out of the loop. Feelings of belonging, value, and connectedness with others may be a strong motivation for an adolescent to seek out health information online.

### 6.3. Self-Determination Theory—Justification

Given the current societal concerns and interest with social media and its influence on adolescents, self-determination theory will be a useful framework for understanding various aspects of adolescents' motivation and experiences seeking sexual health information online and through social media. Understanding how motivation related to the needs of autonomy, relatedness, and competence might influence social media use, particularly in searching for sexual health information, will provide additional insight into why, how, and what groups social media use is affecting both positively and negatively. An increase in the awareness of adolescents with health concerns with regard to using the internet and social media as sexual health information sources has led to greater interest in determining the motivations for the use of social media related to health content. Understanding adolescents' use of social media and internet sources as tools for seeking sexual health information impacts the future use of online digital health interventions and the online presence of health educators and health organizations. It also greatly aids in understanding and determining consequences, positive and negative that may be related to adolescents' overall well-being. SDT provides a framework grounded in understanding motivation which will be useful in gaining insight into the world of adolescent internet and social media use.

As a framework, SDT has been used in a variety of ways to help understand various health behaviors among adolescents, including dieting (e.g., [198]), engagement in risky behaviors such as unprotected sex and illicit substance use (e.g., [199]), cyberbullying (e.g., [200]), social media-driven anxiety (e.g., fear of missing out, FOMO; [201,202]), use of social media in project-based learning (e.g., [203]), and even youth participation in social distancing during the COVID-19 pandemic (e.g., [197]).

Accessing sexual health information online through social media may be linked to basic needs to be autonomous and competent and to relate to others. The effects of social-contextual factors on human motivation (i.e., the need to connect with others online) may be fueling adolescents' ideas about health information, where to find it, and what to do with it. Using SDT as a framework for understanding adolescent sexual health-seeking behavior, particularly through the use of social media, holds merit in that the constructs developed by self-determination theorists may be found in research looking at online health information-seeking behavior and online help-seeking behavior. Adolescents may provide reasons for searching for information online, which can then be categorized into motivations related to their personal autonomy, competence, and feelings of relatedness with others. Examples of this include research regarding why adolescents use the internet, why they use the internet or social media for accessing sexual health information, and how they use the internet and social media to learn about health issues (e.g., [33–36,71,102,106]). Online health resources may or may not meet adolescents' need for autonomy, competence, and relatedness [185].

In a review of 28 studies from around the world (Australia, the U.K., The Netherlands, the U.S., Ireland, and Canada, each with a sample size ranging from 23 to 3946 participants), it was found that among young people ages 12–25 presenting psychological distress, online help-seeking behavior involving mental health resources and health information was common and that approaches to improving online help-seeking should consider the role the internet and online services may play in an adolescent's life when compared to traditional off-line sources. Suggestions were provided using SDT as a framework in developing improved online resources [185].

Pretorius and colleagues [185] suggested the benefits and limitations of online resources based on the primary psychological needs identified in SDT. Each benefit and limitation could present as a motivating influence on an adolescent's determination or desire to seek sexual health information online. The autonomy benefits include the anonymity and possible privacy associated with accessing information online, ease and immediacy of access, personal control of one's journey in seeking information, and the possibility of meeting needs of self-reliance. The limitations of autonomy include privacy and confidentiality concerns, and the avoidance of seeking treatment [185]. The benefits of competence include ideas of online access to health information acting as a possible gateway for continued or further help-seeking and health information-seeking behavior, as well as early access to services or material not yet widely available through more traditional means (e.g., doctor visits and print material). The major limitation of competence was a lack of health literacy [185]. The benefits of relatedness were feelings of inclusivity and connecting with others who might have similar experiences. The limitations of relatedness were a lack of immediate and/or crisis support and the possibility of triggering negative behavior [185].

Using SDT as a framework for understanding adolescent sexual health-seeking behavior online and via social media will result in a greater understanding of the motivation to fulfill the need for autonomy, competence, and relatedness. Individual motivations for meeting their autonomy needs will be better understood, as answers to why adolescents search for sexual health information online are received. Adolescent initiatives in searching for sexual health information online, choices of what to search, how, on what platform, for how long, and actions taken as a result of information sought all relate to SDT's motivational principles of autonomy [150,171]. Personal motivation related to meeting the need for competence will be more fully comprehended as answers to why adolescents search for sexual health information online, more so than other sources, are explored. Adolescent feelings of mastery and personal success in accessing online sexual health information, as well as confidence in their abilities to find and receive good health information relate to SDT's motivational principles of competence [150,171]. Also, understanding adolescents' motivation to fulfill their need for relatedness will be deepened as insight is gained into their feelings of connectedness with others as well as their personal sense of value and belonging. Adolescents' feelings of relatedness to others through accessing sexual health information for themselves and others, understanding the newest and latest trends in health, and the possible connection with others via means of participating in similar activities, relate to SDT's motivational principles of competence [150,171].

Self-determination theory provides an overarching framework for considering influences in adolescent online sexual health-seeking behaviors. However, causality needs to be considered. Does social media use predict an adolescent's engagement in seeking sexual health information? Or does curiosity surrounding sexual health information and seeking answers lead to social media use? In the end, causality is likely to be influenced by not one origin, but many. This is particularly probable given the many facets of adolescence and the rapid growth and development being experienced by adolescents (e.g., 123]).

### Social Media Connection

There are many motives influencing adolescent social media use. Examples include seeking information, establishing/maintaining relationships, building social connections or self-expression, and having a fear of missing out [159,204]. Physical, cognitive, and social changes, as well as psychosocial changes, experienced by an adolescent may have various effects on social media use or sexual health-seeking behavior. For example, an adolescent experiencing a change in their body, such as menstruation, may seek out information on social media about which types of menstrual products to use (e.g., physical changes spurring social media use). Additionally, an adolescent might seek out social media groups connecting them to local LGBTQ+ groups (e.g., cognitive changes, such as metacognition, spurring social media use or a need for establishing one's identity, influencing prominent members of the LGBTQ+ community to follow).

Given the many influences that media of all types, particularly social media, may have on adolescents and the interactions that various aspects of development may have with media, it is imperative that researchers working with adolescents focus on adolescent health and good health education. Participation in good health education provides the opportunity for adolescents to learn and practice skills which may lead to positive health outcomes. It is also necessary that health education efforts ensure adolescents learn content that is medically accurate, relevant, developmentally appropriate, and inclusive. This is particularly true for human sexuality education.

## 7. Conclusions

It is difficult to imagine health education and promotion without online teaching tools or social media in today's world. The physical barriers of traditional sexual health education are erased within the bounds of the online world. For example, a live streaming of a course teaching about sexual health, open to all, may be viewed on Instagram by any user. Using social media as an educational tool within the bounds of health education curricula can promote learning and well-being. Various social media platforms can be promoted and combined with multiple teaching methods meant to engage students in formal and informal learning to ultimately enhance learning and psychological well-being. Even the use of online social media tools to collect anonymous questions during a sexual health instructional unit has implications for educational practice and student learning.

For adolescents, the medium of social media aligns with key developmental behaviors and desires, namely independence, risk taking, and participation and interest in peer groups [155,205]. It is an appealing, engaging, and attractive medium [64,155,205]. The use of social media within education provides adolescents opportunities to practice autonomy (e.g., decide what material to create, what medium to use, how to engage with others, how often, etc.). It can also provide a moderated, relatively safe space within which adolescents may take risks (e.g., creating and distributing material for others to critique) and interact with peers in the digital environment.

Through the use of social media to promote sexual health education, adolescents can be given opportunities to analyze, interpret, synthesize, and critique material. They can learn and practice validating, assessing, and evaluating material they find and read, particularly when it comes to issues of information authenticity and legitimacy. Individuals may also learn functional media skills related to literacy; media literacy; and in a health classroom, health and e-health literacy [206].

In utilizing social media within sexual health education, there are still questions for best practices to consider [207]. For example: What methods prove best for users to access, negotiate, and/or create sexual health informational content that may lead to beneficial impact on behavior? Challenges exist within sexual health education and promotion while utilizing social media, and best practices for designing, implementing, and evaluating health education material on social media platforms are still being discovered [207]. This is particularly true for subsets of major populations, such as adolescents.

Investigating the types of social media platforms adolescents use for accessing (or being exposed to) online health information related to sexual health opens the window for researchers to better gauge adolescent health education needs. The same is true of understanding adolescent perceptions of health content on social media. Knowledge gained from these investigations will allow researchers and curriculum developers to better target adolescent needs within health education efforts, particularly those based in social media or other online platforms. This then has practical implications for the design, implementation, and evaluation of health education material and it opens doors for individuals to better access and negotiate health information, ultimately influencing behavior.

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