

Communicable Disease Preventive Behavior among Adolescents

Kodchasorn Rattanavichai^{a*}, Chutiya Chitboonthaweek^b, Methasit Mungkalarungsi^c

^aSamakhi Withthayakhom School, 159 Thanon Baanpa Pragarn Road, Tambon Wiang, Amphoe Mueang Chiang Rai, Chang Wat Chiang Rai 57000, Thailand

^bPatumwan Demonstration School, Srinakharinwirot University, 2 Henri Dunant Rd, Khwaeng Pathum Wan, Khet Pathum Wan, Krung Thep Maha Nakhon 10330, Thailand

^cHorwang School, 16/9 Thanon Ho Wang, Chatuchak, Bangkok 10900, Thailand

*Corresponding author email: kprattanavichai@gmail.com

Abstract

Infectious diseases are illnesses that can be transmitted from person to person through various types of microorganisms that cause the disease. Communicable diseases have significant impacts on the population's health, the healthcare system, the economy, and other aspects. The infection rates and mortality rates associated with infectious diseases have a collective effect on the overall health of the population and the healthcare system. Preventing infectious diseases through public behaviors and public health measures is crucial in controlling the spread of these diseases. Measures such as vaccination, practicing hand hygiene, ensuring food safety, avoiding close contact with sick individuals, practicing safe sexual behaviors, staying home when feeling unwell, and regularly cleaning and disinfecting frequently touched surfaces are effective strategies. However, the success of prevention efforts relies on a collective effort from individuals, communities, and public health measures. Teenagers play a significant role in preventing the spread of communicable diseases, but they may engage in certain risk behaviors that increase their vulnerability and contribute to disease transmission. Addressing these risk factors through education, awareness campaigns, and fostering a sense of responsibility towards personal and community health is crucial. Understanding the Chain of Infection model, which illustrates the steps involved in the transmission of infectious agents, is essential in preventing communicable diseases. By identifying and breaking these links, public health officials can implement measures to control the spread of the disease. In conclusion, preventing communicable diseases requires a comprehensive approach that includes education, empowerment, and creating a supportive environment. By adopting strategies such as comprehensive health education, peer involvement, accessible healthcare services, vaccination campaigns, and life skills development, we can empower teenagers to take an active role in preventing communicable diseases and create a healthier and safer environment for themselves and their communities.

Keywords: infectious disease, communicable disease, spreading, adolescents,

Introduction

Communicable diseases are diseases that can be spread from person to person through various types of microorganisms that cause the illness. While pathogens are the main cause of infections, human behavior can also play a role in the occurrence of these diseases. Many dangerous infectious diseases have been successfully controlled and eliminated. Although some infectious diseases still remain, their impact has been reduced. However, there are still several types of communicable diseases that persist and continue to be a concern.)Si Phum Subdistrict Administrative Organization, Thailand, n.d.(

Infectious diseases have profound effects on multiple aspects of individuals' lives, encompassing health, mental well-being, and the economy. They exert a significant impact on the general health of the population and the healthcare system. The rise in infection rates and mortality rates associated with infectious diseases

greatly influences the overall health of the population and the healthcare system as a collective entity. (Kasetsart University, 2020)

Based on the Chain of Infection, a conceptual model used in public health and epidemiology to understand and prevent the spread of infectious diseases. It illustrates the various steps involved in the transmission of an infectious agent from one person (or host) to another. By identifying and breaking these links, public health officials can implement measures to control the spread of the disease. The chain of infection typically consists of six links: 1) Infectious Agent: This is the first link in the chain and refers to the microorganism or pathogen that causes the disease. Infectious agents can be bacteria, viruses, fungi, parasites, or other microorganisms capable of infecting a susceptible host. 2) Reservoir: The reservoir is the second link and refers to the habitat in which the infectious agent lives, grows, and multiplies. Reservoirs can be living organisms (humans, animals, insects) or nonliving (contaminated soil, water, food) environments. 3) Portal of Exit: This link represents the path through which the infectious agent leaves the reservoir. Common portals of exit include respiratory secretions (coughing or sneezing), feces, urine, blood, and other bodily fluids. 4) Mode of Transmission: The mode of transmission is the method by which the infectious agent is transmitted from the reservoir to a susceptible host. There are three main modes of transmission: 4.1) Direct Contact Transmission: The infectious agent is transmitted directly from one person to another through physical contact (e.g., touching, kissing) or contact with their body fluids. 4.2) Indirect Contact Transmission: The infectious agent is transmitted indirectly through contact with contaminated objects (fomites) such as doorknobs, utensils, or surfaces. 4.3) Airborne Transmission: The infectious agent is spread through the air, usually in the form of droplets or dust particles, and can be inhaled by a susceptible person. 5) Portal of Entry: This link represents the path through which the infectious agent enters a susceptible host. Similar to the portal of exit, it can be through the respiratory tract, digestive tract, broken skin, mucous membranes, etc. 6) Susceptible Host: The final link in the chain is the person who is at risk of becoming infected with the infectious agent. Factors that can influence susceptibility include age, overall health, immune status, and genetic predisposition.

If any of these links are broken, the infection cannot spread. For example, if you wash your hands often with soap and water, you can break the chain of infection for many diseases that are spread through the fecal-oral route. Understanding the chain of infection is crucial in preventing communicable diseases due to its multiple benefits. It helps in identifying specific steps to prevent the spread of a particular disease, developing effective strategies for disease prevention, and educating others about preventive measures. By comprehending the chain of infection, individuals can actively participate in safeguarding themselves and others from getting sick. Preventing communicable diseases necessitates a combination of individual actions, community efforts, and public health measures. Several effective strategies can be employed, including vaccination, practicing hand hygiene, ensuring food safety, avoiding close contact with sick individuals, practicing safe sexual behaviors, staying home when feeling unwell, and regularly cleaning and disinfecting frequently touched surfaces. However, successful prevention relies on a collective effort. By consistently implementing these preventive measures, we can protect ourselves, our loved ones, and our entire community from the spread of infectious diseases. (Ministry of Health of New Zealand, 2022)

Teenagers wield significant influence in preventing the spread of communicable diseases, but they may inadvertently engage in certain risk behaviors that heighten their vulnerability and contribute to disease transmission. Some of these behaviors include a lack of awareness regarding disease prevention, unsafe sexual practices, succumbing to peer pressure and engaging in risky social behaviors, neglecting proper hand hygiene, and participating in social gatherings with close contact. To effectively curb the spread of infectious diseases among teenagers, it is crucial to address these risk factors through education, awareness campaigns, and fostering a sense of responsibility towards personal and community health. This study reviews the current situation of teenagers' communicable disease prevention behaviors from previous research and studies by analyzing related factors based on KAP theory.

Teenagers risk behavior of getting communicable diseases

Teenagers play a crucial role in preventing the spread of communicable diseases. However, they may engage in certain risk behaviors that can increase their vulnerability and contribute to the transmission of diseases. Here are some common risk behaviors among teens and ways to address them in relation to preventing communicable diseases. (Warachai, 2001; Phongkumma, 2017; Health Center 4, Saraburi, n.d.) Lack of awareness: Teens may have limited knowledge about communicable diseases and how they are transmitted. Naruchaya Jarusirivattana's study (Jarusirivattana, 2022) study suggested that respiratory infections like COVID-19 have been found to be generally low in terms of students' knowledge. This may lead to a lack of awareness about the severity of the disease or proper prevention measures. As a result, adolescents may be at risk of contracting it.

Teens may engage in unprotected sex, multiple sexual partners, or other risky sexual behaviors, increasing their risk of contracting sexually transmitted infections (STIs) This is because adolescents often engage in sexual activity and may lack knowledge and understanding about self-protection. This lack of awareness can lead to a failure to take precautions, potentially resulting in the transmission of STIs through sexual contact. (Chularat 3 International Hospital, n.d.; Charoensiri, et al., 2019)

Adolescents may engage in substance abuse due to peer influence, curiosity, or proximity to those who use such substances. This behavior can have severe consequences, including damage to the nervous system, impacting mental well-being, and potentially leading to conditions like depression, anxiety, and various mental disorders due to the toxic effects of the substances. Additionally, it can distort self-image, lead to self-neglect, and diminish self-awareness. Furthermore, the consumption of these substances weakens the body, making it more susceptible to illness and infection (Ritmontri, and Kanato, 2016; Yongstar, 2021; Chumpadjamikorn, n.d.)

Teens may neglect getting recommended vaccinations, leaving them susceptible to vaccine-preventable diseases like measles, mumps, or HPV-related cancers. Recently, there was vaccine hesitation during the COVID-19 pandemic due to being unsure about the vaccine. (Bansupa, 2021; Mungkalarungsi, et al., 2021)

Sharing items is another behavior that poses a risk of infection, such as using shared utensils like cups and spoons for eating. Adolescents, in their pursuit of convenience, may often borrow these items, which can be a contributing factor to the risk of infection, especially when using shared items for eating (Chandrabanjakul, 2021; Ministry of Public Health, 2022)

Teens may not prioritize proper hand hygiene, which is essential for preventing the transmission of communicable diseases. Reinforce the importance of regular handwashing with soap and water for at least 20 seconds, particularly before eating, after using the restroom, or when in contact with potentially contaminated surfaces. Foodborne infections can be caused by bacteria, viruses, and parasites. These infections often result from consuming contaminated food and dirty water. The disease-causing agents are typically found in water, food, and on hands, and can enter the body through the mouth. They may also linger on utensils like spoons, glasses, plates, and bowls. Adolescents, who tend to emulate their peers for convenience, may not consistently practice disease prevention, handwashing, or cleaning utensils before meals. This lack of vigilance can potentially put them at risk of contracting diseases. (online manager, 2018)

Teens often engage in social activities that involve close physical contact, such as parties, concerts, or sports events. During disease outbreaks, such gatherings can contribute to the rapid spread of infections. Encourage teens to follow public health guidelines, such as practicing physical distancing, wearing masks when necessary, and avoiding crowded places during periods of high transmission. (Office of the Health Promotion Foundation, 2020)

Online behaviors: With the increasing use of social media and online platforms, teens may be exposed to misinformation or engage in cyberbullying related to health issues. Promote media literacy and critical thinking skills to help teens evaluate the accuracy of information, and educate them on the potential consequences of online behaviors that can harm their own health or the health of others.

It is crucial to provide teens with comprehensive education, support, and guidance to empower them to make informed decisions and adopt healthy behaviors that reduce their risk of contracting and spreading communicable diseases. Engaging parents, schools, healthcare providers, and community organizations in

promoting positive health practices among teenagers can have a significant impact on disease prevention

Teenagers' pathogen spreading prevention behaviors

Previous studies conducted on teenager groups, mostly student groups, which mean teenagers who were not in the school system may not be included in these findings. Based on the studies conducted from 2010 to 2022 regarding disease transmission prevention behaviors among students and individuals aged 15-22, the research can be divided into two periods: before the outbreak of COVID-19 and during the COVID-19 pandemic. For the period before the COVID-19 outbreak (2010-2020), it was found that the majority of the sample group had a moderate to low level of knowledge about health, disease transmission prevention, and infectious disease prevention. This varied based on the educational profile, such as students studying in the medical field who generally had a good level of knowledge about disease transmission prevention. (Suebsamran, et al., 2011 ; Phonmalairungruang, and Sampaotong, 2012 ; Yenpoca, 2010)

A study conducted during 2009, when the novel H1N1 influenza in 2009 was spreading, many people erroneously believed that covering one's mouth with hands when coughing or sneezing could prevent the spread of the disease to others. However, in reality, using hands to cover the mouth during coughing or sneezing can contaminate the hands with the disease-causing agent. This can then lead to the transmission of the disease to other objects we touch. Additionally, if hands are used to rub the eyes or pick the nose, it can introduce pathogens into the body. Overall, according to a survey conducted in 2009, the majority of the sample group had a relatively good understanding of the H1N1 influenza prevention, particularly the H1N1 type H1N1. However, it was found that at least half of the sample group exhibited behaviors related to H1N1 prevention, especially wearing masks to cover their mouths and noses, which varied among different age groups. (Waeputeh, et al., 2021)

After the COVID-19 pandemic, there are prevention behaviors known as the "New Normal." Most people will have their temperature checked at screening points before entering schools and will clean their hands regularly. The temperature should not exceed 37.5 degrees Celsius. Additionally, most people will wear face masks or cloth masks when necessary, especially when entering crowded areas. In addition to wearing masks, it is advisable to maintain distance and avoid sharing items with others. Adolescents exhibit a range of behaviors in preventing infectious diseases, including low, moderate, and high levels of compliance. Research indicates that adolescents generally have a moderate to good understanding of diseases and disease prevention. Attitudes towards diseases are typically in the moderate to good range. Moreover, most adolescents demonstrate a moderate to high level of knowledge and practice in disease prevention. This suggests that those who engage in prevention behaviors are often in environments with good knowledge resources and have received effective training in prevention methods. Schools play a significant role in teaching disease prevention and instilling effective prevention practices, emphasizing the importance of prevention. Therefore, prevention behaviors among adolescents are generally at a good or high level. (Jaisan, 2020; Chaengaksorn et al., 2021; Makarabhirom, 2021)

While high school students have knowledge about preventing the spread of diseases ranging from low to moderate, this varies based on family background, socioeconomic status, parental occupation, and career interests. Factors related to knowledge include class level, parental occupation, family income, study plans, and career interests. The majority of the sample group received health care information from the internet, parents, friends, and school lessons.

In the study conducted from 2021 to 2022, it was found that attitudes towards preventing the spread of diseases among the majority of the sample group were at a moderate to high level. Factors associated with attitudes towards disease prevention were influenced by public experience with the COVID-19 pandemic. Increased knowledge and understanding of infectious diseases and prevention resulted in more accurate attitudes towards preventing the spread of diseases. This perception was further affected by the analysis of factors including knowledge of health, disease prevention, infectious diseases, and the school environment, influencing behavior in preventing disease transmission. (Makarabhirom, 2021; Waeputeh, et al., 2021)

In terms of behavior to prevent the spread of diseases, a study conducted between 2010 and 2020 found that the sample group exhibited a range of preventive behaviors from low to high. This was dependent on educational background and parental occupation profiles, which were factors influencing the level of knowledge regarding disease prevention and subsequently affecting preventive behavior.

In the period of 2021-2022, the study found that the sample group had a moderate to high level of knowledge regarding the prevention of disease transmission. During this time frame, the majority of the population learned about disease prevention, particularly in light of the COVID-19 pandemic that occurred (Thawanworakit, and Wittaya, 2022; Thawanworakit, and Wittaya, 2022; Jarusirivattana, 2022)

In terms of attitudes towards health behaviors and disease prevention, dividing the study into the periods of 2010-2020, it was found that the general public's attitude towards disease prevention ranged from low to high. This depended on the education and occupation profiles of parents.

From the study conducted in the period of 2021-2022, it was observed that the sample group exhibited behaviors of disease prevention at a moderate to high level. This was attributed to the ongoing COVID-19 pandemic. The population gained knowledge about the disease and ways to protect themselves from infection and disease transmission. However, the level of prevention and willingness to receive vaccinations depended on factors such as the environment, peer influence, perception of risk, and confidence in government-provided vaccines. (Jarusirivattana, 2022; Dejsuwannachai, 2022; Petpaiboon, 2021; Makarabhirom, 2021; Chailangka, et al., 2023; Al-Mamun, et al., 2022; Alves, et al., 2020)

Adolescents' behaviors in preventing infectious diseases range from low to moderate to high. Research indicates that adolescents generally have a moderate to good understanding of diseases and disease prevention. Attitudes towards diseases are typically in the moderate to good range. Moreover, most adolescents demonstrate a moderate to high level of knowledge and practice in disease prevention. This suggests that those who engage in prevention behaviors are often in environments with good knowledge resources and have received effective training in prevention methods. Schools play a significant role in teaching disease prevention and instilling effective prevention practices, emphasizing the importance of prevention. Therefore, prevention behaviors among adolescents are generally at a good or high level. (Makarabhirom, 2021)

Another group of adolescents with lower levels of knowledge about disease prevention, behaviors to prevent diseases, and attitudes towards disease prevention may be due to the fact that their schools do not provide in-depth education about infectious diseases. Consequently, these adolescents may only have basic knowledge, and those with lower awareness are less likely to perceive the risk of infection when engaging in recreational activities. This is because during the past period, activities were often conducted online, leading to a lack of awareness about the risks and the importance of disease prevention or the diseases that might be prevalent. Additionally, sharing meals together may not have been viewed as a preventative measure, as adolescents are social and communicative by nature, sometimes not considering prevention at that moment, which can lead to a higher risk of infection.

However, it is observed that adolescents' behaviors are often influenced by the society or environment they are in. This is because adolescents tend to socialize and interact with peers and may not always think about prevention during such interactions. This can lead to an increased risk of infection. Therefore, one of the reasons why this group of adolescents has low prevention behaviors may be due to a lack of education or reinforcement in prevention, or they may not have access to information, or they may be in an environment with low levels of prevention or knowledge about diseases. This results in them not knowing how to protect themselves from diseases or how the pathogens work. Due to these reasons, this group of adolescents exhibits low prevention behaviors against diseases. (Dejsuwannachai, 2021; Jarusirivattana, 2022)

Guidelines for Promoting Preventive Behaviors for Communicable Diseases

Promoting and supporting teenagers in preventing communicable diseases involves a comprehensive approach that includes education, empowerment, and creating a supportive environment. Here are some strategies to promote and support teenagers in preventing communicable diseases.

Comprehensive health education: Implement comprehensive health education programs in schools that cover topics related to communicable diseases, including transmission modes, prevention strategies, and the importance of vaccinations. Provide accurate and age-appropriate information to empower teenagers with knowledge about communicable diseases and their prevention (Wang, et al., 2018)

Peer education and involvement: Encourage peer-to-peer education by involving teenagers in awareness campaigns and health promotion initiatives. Teens often listen and relate better to their peers, so encouraging them to become ambassadors for disease prevention can have a significant impact. Provide them with resources and training to effectively communicate preventive measures and address common misconceptions. (Wang, et al., 2018; Frantz, 2015)

Accessible healthcare services: Ensure that teenagers have access to affordable and youth-friendly healthcare services. This includes providing information about clinics, reproductive health services, and vaccination centers. Offer confidential and non-judgmental services that respect their privacy and autonomy.

Vaccination campaigns: Organize vaccination campaigns targeting teenagers, particularly for vaccines recommended for their age group, such as HPV, meningococcal, or COVID-19 vaccines. Raise awareness about the importance of vaccinations in preventing communicable diseases and address any concerns or misconceptions they may have. (Voyer, and Provencher, 2021; Chevalier-Cottin, et al., 2020)

Encourage healthy behaviors: Promote healthy behaviors among teenagers, such as regular handwashing, practicing safe sex, and adopting a balanced diet. Provide information on the benefits of these behaviors in preventing the transmission of communicable diseases. (Achterberg, et al., 2010)

Life skills development: Equip teenagers with life skills that enable them to make informed decisions about their health and well-being. This includes teaching them effective communication, critical thinking, problem-solving, and decision-making skills. Such skills will empower them to navigate situations related to communicable disease prevention effectively. (Mohapi, and Pitsoane, 2017)

Supportive school policies: Implement and enforce school policies that promote a healthy environment and prevent the spread of communicable diseases. This can include guidelines on hand hygiene practices, routine cleaning of facilities, proper waste disposal, and protocols for responding to outbreaks of infectious cases.

Parent and family involvement: Engage parents and families in supporting teenagers' efforts to prevent communicable diseases. Provide resources and information to parents about disease prevention, including vaccinations, safe sex practices, and hygiene habits. Encourage open communication within families about health-related topics. (Lynn, et al., 2022 ; Barnes, et al., 2020 ; Carroll, and Vickers, 2014)

Utilize technology and social media: Leverage technology and social media platforms to disseminate accurate and reliable information about communicable diseases and prevention strategies. Engage with teenagers through online platforms, blogs, or informative videos to create awareness and address their concerns. (Chen, and Wang, 2021)

Community involvement and partnerships: Collaborate with community organizations, healthcare providers, youth groups, and local authorities to create a community-wide approach to communicable disease prevention. Work together to organize health fairs, workshops, and awareness campaigns that specifically target teenagers. (Carson, et al, 2021; Oakley, 1989)

By adopting these strategies, we can empower teenagers to take an active role in preventing communicable diseases, make informed decisions, and create a healthier and safer environment for themselves and their communities.

Conclusion

Adolescents' behaviors in preventing communicable diseases range from low to high. The majority of research findings indicate that adolescents have a moderate to good level of understanding about diseases and disease prevention, as well as attitudes towards disease prevention. It is commonly observed that in order for adolescents to have knowledge about prevention or engage in preventative measures at a moderate to high level, they must have access to effective sources of information or be well-educated through training. This means that

adolescents who exhibit preventative behaviors are often in environments with good knowledge, receive thorough education about disease prevention in schools, and emphasize preventative measures. As a result, their disease prevention behaviors tend to be at a good or high level. However, they may sometimes lack thoroughness and vigilance in prevention in certain situations.

One of the ways to improve adolescents' preventative behaviors is to widely disseminate knowledge. Some groups of adolescents may have lower preventative behaviors due to insufficient or narrowly focused knowledge provided to them. Therefore, one of the approaches to enhance adolescents' preventative behaviors is to provide them with effective and comprehensive sources of knowledge.

References

- Achterberg, T.V. Waal, G.H. Ketelaar, N. Oostendorp, R.A. Jacobs, J.E. & Wollersheim, H.C. (2010). How to promote healthy behaviours in patients? An overview of evidence for behaviour change techniques. National Library of Medicine. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3090154/>
- Al-Mamun, A. Hayat, N. Thi My Dieu, H. R. Zainol, N. & A. Salameh, A. (2022). COVID-19 preventive behavior among university students in Southeast Asia: Effects of knowledge, concern, awareness, and perceived risk. National Library of Medicine. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9500200/>
- Alves, R.F. Samorinha, C. Precioso, J. & Portugal, B. (2020). Knowledge, attitudes and preventive behaviors toward COVID-19: a study among higher education students in Portugal. *Journal of Health Research*, 35(4), 318-328. <https://www.emerald.com/insight/content/doi/10.1108/JHR-07-2020-0254/full/html>
- Bansupa, N. (2021). Willingness to vaccinate against COVID-19: A study among high school students in Montfort College Chiangmai, Thailand. *International Journal of Healthcare Sciences*, 9(2), 25-31. <https://www.researchpublish.com/papers/willingness-to-vaccinate-against-covid-19-a-study-among-high-school-students-in-montfort-college-chiangmai-thailand>
- Barnes, M.D. Hanson, C.L. Novilla, L.B. Magnusson, B.M. Crandall, A.C. & Bradford, G. (2020). Family-Centered Health Promotion: Perspectives for Engaging Families and Achieving Better Health Outcomes. National Library of Medicine. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7278332/>
- Carroll, L.M. & Vickers, M.C. (2014). The Role of Families in Health Promotion: Family Wisdom about Health and Wellness Knowledge, Strategies, and Barriers. *Family Voices*. https://www.fv-impact.org/files/1314/4594/8100/TheWisdom_of_Families_10-07-2014.pdf
- Carson, S.L. Gonzalez, C. Lopez, S. Morris, D. Mtume, N. Lucas-Wright, A. Vassar, S.d. Norris, K.C. & Brown, A.F. (2021). Reflections on the Importance of Community-Partnered Research Strategies for Health Equity in the Era of COVID-19. National Library of Medicine. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8381652/>
- Chaengakorn, Y. Masantia, J. Tanthasen, N. & Kantaphong, N. (2021). PREVENTION BEHAVIOR OF CORONAVIRUS 2019 AMONG LEARNERS IN NEW NORMAL. *Journal of Education Sakon Nakhon Rajabhat University (Online)*, 1(3), 62-76. <https://edu.snru.ac.th/wp-content/uploads/2022/01/5-62.pdf>
- Chailangka, W. Wicha, T. Kaewta, Y. Sumadon, S. & Somboon, L. (2023). Factors Related to COVID-19 Preventive Behaviors Among School-Age Children in Chiang Rai Municipality. *Nursing Journal CMU*, 50(2), 212-226. <https://he02.tci-thaijo.org/index.php/cmunnursing/article/view/262511/180096>
- Chandrabenjakul, W. (2021). Gathering around to eat food risks being infected with COVID-19. Chulalongkorn Hospital. <https://chulalongkornhospital.go.th/kcmh/line/ล้อมวงกินข้าวเสี่ยงติด#:~:text=การใช้ภาชนะรับประทานอาหาร,ของเชื้อโรคโควิด-19>
- Charoensiri, S. Toonsir, C. & Leelukkanaveera, Y. (2019). Factors Affecting Sexually Transmitted Infection Preventive Behaviors among Male Students in Non-formal Education. <https://he01.tci-thaijo.org/index.php/pnc/article/download/186009/139302/606990>
- Chen, J. & Wang, Y. (2021). Social Media Use for Health Purposes: Systematic Review. National Library of Medicine. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8156131/>
- Chevalier-Cottin, E. Ashbaugh, H. Brooke, N. Gavazzi, G. Santillana, M. Bulet, N. & Htar, M.T. (2020). Communicating Benefits from Vaccines Beyond Preventing Infectious Diseases. National Library of Medicine. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7452969/>
- Chularat 3 International Hospital. (n.d.). sexually transmitted diseases. https://www.chularat3.com/knowledge_detail.php?lang=th&id=562
- Chumpadjamikorn, A. (n.d.). child addicted to drugs. Rama mental. <https://www.rama.mahidol.ac.th/ramamental/generalknowledge/06212014-1613>
- Dejsuwannachai, R. (2021). Knowledge, Attitude and Preventive Behavior toward COVID-19 among grade 10-12 students in Bangkok. *INSTITUTE FOR URBAN DISEASE CONTROL AND PREVENTION JOURNAL*, 6(2), 1-15. <https://he01.tci-thaijo.org/index.php/iudcJ/article/view/250811/172222>
- Frantz, J.M. (2015). A peer-led approach to promoting health education in schools: The views of peers. *South African Journal of Education*, 35(1), 1-7. https://www.researchgate.net/publication/276722245_A_peer-

led_approach_to_promoting_health_education_in_schools_The_views_of_peers

- Health Center 4, Saraburi. (n.d.). อนามัยวัยรุ่น. <https://region4.anamai.moph.go.th/knowledge/academic/agegroup/items?cate=teenage>
- Jaisan, J. (2020). COVID-19 PREVENTATIVE BEHAVIOUR OF THE STAFF IN THE NATIONAL INSTITUTE OF HEALTH, DEPARTMENT OF MEDICAL SCIENCES. Ramkhamhaeng University. <https://mmm.ru.ac.th/MMM/IS/sat16/6114060102.pdf>
- Jarusirivattana, N. (2022). Case Study: Knowledge, Attitude, and Health and Hygiene practice among students aged 11-20 years old in an International School in Ladkrabang, Bangkok, Thailand. INSTITUTE FOR URBAN DISEASE CONTROL AND PREVENTION JOURNAL. 7(1). 1-11. <https://he01.tci-thaijo.org/index.php/iudcJ/article/view/253769/174311>
- Kasetsart University.(2020). Impact on the public health system. <https://learningcovid.ku.ac.th/course/?c=7&l=1>
- Lynn, Y. Mahirah, D. Ho, C. & Thumboo, J. (2022). The role of the family in health promotion: a scoping review of models and mechanisms. National Library of Medicine. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9673498/>
- Makarabhirom, T. (2021). Knowledge, attitude, and preventive behavior toward COVID-19 of high school students in Bangkok, Thailand: A study among students in Harrow International School. International Journal of Medical Science and Public Health, 10(2), 262-268. <https://www.bibliomed.org/mnsfulltext/67/67-1628756743.pdf?1688886212>
- Makarabhirom, T. (2021). Knowledge, Attitude and Preventive Behavior toward COVID-19 of high school students in Bangkok, Thailand: A study among students in Harrow's International School. International Journal of Life Sciences Research, 9(4), 63-70. <https://www.researchpublish.com/papers/knowledge-attitude-and-preventive-behavior-toward-covid-19-of-high-school-students-in-bangkok-thailand-a-study-among-students-in-harrows-international-school>
- Ministry of Health of New Zealand. (2022). Prevent the spread of infectious disease
- Ministry of Public Health. (2022). Survey of student health status in Thailand 2021. Knowledge Bank. <https://kb.hsri.or.th/dspace/handle/11228/5784?locale-attribute=th>
- Mohapi, B.J. & Pitsoane, E.M. (2017). Life skills as a behaviour change strategy in the prevention of HIV and AIDS: Perceptions of students in an open and distance learning institution. National Library of Medicine. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5639614/>
- Mungkalarungsi, S. Tangjongrach, K. Sooparichthiros, P. Limprasert, A. Eamsawat, K. Khiesosiri, I. & Ratanavila, N. (2021). Intention to vaccinate against COVID-19 of high school students aged 16-18 years old in Thailand: Cross sectional online survey. INSTITUTE FOR URBAN DISEASE CONTROL AND PREVENTION JOURNAL, 6(2), 16-36. <https://he01.tci-thaijo.org/index.php/iudcJ/article/view/250828/172223>
- Oakley, P. (1989). Community involvement in health development An examination of the critical issues. 1. <https://apps.who.int/iris/bitstream/handle/10665/39856/9241561262.pdf>
- Office of the Health Promotion Foundation. (2020). "Quit" 10 habitual behaviors to "reduce" your risk of COVID-19. ThaiHealth. <https://resourcecenter.thaihealth.or.th/index.php/article/เลิก-10-พฤติกรรมเสี่ยง-ลด-เสี่ยงโควิด-19>
- online manager. (2018). Intestinal infection More dangerous than you think. Mgronline. <https://mgronline.com/infographic/detail/9610000117812>
- Petpaiboon, T. (2021). Knowledge, attitudes, and preventive behaviors toward coronavirus disease-19: A study among high school students in Bangkok. International Journal of Medical Science and Public Health, 10(1), 62-67. <https://www.ejmanager.com/mnstemps/67/67-1618460440.pdf?t=1621937829>
- Phongkumma, L. (2017). Problems of teenagers in Thai society. <http://164.115.41.60/knowledge/?p=436>
- Phonmalairungruang, N. & Sampaothong, K. (2012). A Study of Management, Prevention and Control of Influenza A (H1N1) in Influenza A (H1N1) Center at Ramathibodi Hospital. Journal of Public Health Nursing, 26(2), 58-74. <https://he01.tci-thaijo.org/index.php/phn/article/download/47762/39642/>
- Ritmontri, S & Kanato, M. (2016). Illicit Drugs Related Behaviours among Adolescents and Health Impacts. Community Health Development Journal Khon Kaen University , 4(1), 142-151. http://110.164.147.155/kmhealth_new/Document/psychiatry/children/P1.1.1.17.pdf
- Si Phum Subdistrict Administrative Organization, Thailand. (n.d.). Public relations news (communicable diseases What are the things we should know?). <http://sriphoom.go.th/portal/datas/file/1597734712.pdf>
- Suebsamran, P. Sukumarn, P. Bunkhao, L. & Limpiteepakan, P. (2011). Association Between Knowledge, Attitudes and Preventive Behaviors of Pandemic Influenza A (H1N1) Among Students at Ubon Ratchathani University. http://www.esanpedia.oar.ubu.ac.th/e-research/sites/default/files/Phalakorn_Sue2554.pdf
- Thawanworakit, N. & Wittaya, S. (2022). Knowledge, Attitude and COVID-19 Preventive Behavior among Grade 10-12 students in Bangkok, Thailand. International Journal of Healthcare Sciences, 9(2), 32-37. <https://www.researchpublish.com/papers/knowledge-attitude-and-covid-19-preventive-behavior-among-grade-10-12-students-in-bangkok-thailand>
- Voyer, B.G. & Provencher, C. (2021). Vaccination and the Prevention of Communicable Diseases in Healthcare Settings: Lessons from the Covid-19 Pandemic. National Library of Medicine. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8165821/>
- Waeputeh, N. Kanchanapoom, K. & Tansakul, K. (2021). Prevention Behaviors of Coronavirus Disease 2019 Of Songkhla Rajabhat University Students. Journal of Council of Community Public Health, 3(2), 31-39. <https://he01.tci-thaijo.org/index.php/JCCPH/article/download/248114/169967/935609>
- Wang, M. Han, X. Fang, H. Xu, C. Lin, X. Xia, S. Yu, W. He, J. Jiang, S. Tao, H. (2018, March 7). Impact of Health Education on Knowledge and Behaviors toward Infectious Diseases among Students in Gansu Province, China. National Library of

- Medicine.<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5863350/>
- Warachai, N. (2001). Affects sexual risk prevention behavior of students in educational institutions under the office. Vocational Education Committee in Bangkok Area. [Master's thesis, Srinakharinwirot University].
[http://thesis.swu.ac.th/swuthesis/Hea_Ed\(M.S.\)/Nathaphop_R.pdf](http://thesis.swu.ac.th/swuthesis/Hea_Ed(M.S.)/Nathaphop_R.pdf)
- Yenpoca, D.(2010). A STUDY OF FACTORS AFFECTING INFLUENZA A, H1N1 PREVENTATIVE BEHAVIOR OF MATTHAYOMSUKSA I - III STUDENTS IN BANGKOK METROPOLITAN, EAST BANGKOK [Master of Education Degree in Educational Research and Statistics at Srinakharinwirot University].https://ir.swu.ac.th/jspui/bitstream/123456789/99808/1/Supida_Y.pdf
- Yongstar, S. (2021). Revealing the trend of drugs among Thai teenagers - drug market begins trading via digital currency.
<https://www.bbc.com/thai/thailand-56289278>