

ORIGINAL ARTICLES

How technology help in diagnosis and monitor progress and understanding of mental wellbeing: initial results in the department of adolescent health, National Pediatric Hospital, Vietnam

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ABSTRACT

Telehealth technology model has been applied for health care services in Vietnam during the COVID-19 pandemic. To actively overcome the difficulty of accessibility of patients, the National Children's Hospital equipped the telehealth system to support remote diagnosis, treatment and monitor patients. This paper is to describe the initial results of applying telehealth in supporting health workers in diagnosis and treatment of common mental disorders in the Department of Adolescent health of the National Children's hospital from June to October, 2021. The telehealth systems offer valuable support to doctors' activities by streamlining and facilitating their work. Telehealth was demonstrated to be feasible, and effective in diagnosis and treatment common mental health disorders among adolescents in Vietnam. The COVID-19 pandemic has facilitated the acceleration and enhancement of telehealth in Vietnam. The lessons learn of telehealth in diagnosis and treatment of common mental health disorders among adolescents may be a useful reference for other departments of the hospital as well as other clinical settings.

Keywords: COVID-19; Vietnam; digital health; pandemic; teleconsultation; telehealth; telemedicine, common mental disorder; adolescents.

INTRODUCTION

The World Health Organization defines mental health as a “state of well-being whereby individuals recognize their abilities, are able to cope with the normal stresses of life, work productively and fruitfully, and make a contribution to their communities.” (1). However, applying such adult based definitions to adolescents and identifying mental health problems in young people can be difficult, given the substantial changes in behavior, thinking capacities, and identity that occur during the teenage years. The impact of changing youth subcultures on behavior and priorities can also make it difficult to define mental health and mental health problems in adolescents.

Although mental disorders reflect psychiatric disturbance, adolescents may be affected more broadly by mental health problems. These include various difficulties and burdens that interfere with adolescent development and adversely affect quality of life emotionally, socially, and vocationally.

Up to 30% of children and adolescents have a diagnosable mental disorder that causes impairment (2). With increasing age, more children develop one or more disorders. All told, about 27.9% of US adolescents aged 13 to 17 are reported to meet criteria for 2 or more disorders (3). Recent studies that follow children from birth to adulthood indicate that most adult mental health disorders begin in early childhood



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and adolescence (4,5). Genes associated with mental health disorders have been reported to show high expression throughout the lifespan, beginning in the 2nd trimester and impacting neurodevelopmental processes, which may explain the early ages of onset (6). Most of these disorders may be viewed as exaggerations or distortions of normal behaviors and emotions.

Today, society's awareness of the urgency to take care of adolescents is increasing. National Pediatrics' Hospital is the first hospital in Vietnam to have established a department adolescent Health for the purpose of providing comprehensive children and adolescent care in the areas of mental health. Evaluate and diagnosis the common mental disorders among adolescents may help for further examination and treatment.

Diagnosis and evaluation of mental disorders among adolescents

Evaluation and diagnosis of mental complaints or symptoms in children and adolescents differs from that in adults in important ways: Developmental context is critically important in children. Behaviors that are normal at a young age may indicate a serious mental disorder if present at an older age. In addition, children exist in the context of a family system, and that system has a profound effect on children's symptoms and behaviors; normal children living in a family troubled by domestic violence and substance abuse may superficially appear to have one or more mental disorders.

Children also exist in the context of environmental stressors such as the COVID-19 pandemic. The resultant disruption of critical routines and isolation from extended family, peers, teachers, and cultural and religious groups have a significant impact, especially on the most vulnerable groups (2). Children often do not have the cognitive and linguistic sophistication needed to accurately describe their symptoms. Thus,

the clinician must rely very heavily on direct observation corroborated by observations of other people, such as parents and teachers.

In many cases, developmental and behavioral problems (eg, poor academic progress, delays in language acquisition, deficits in social skills) are difficult to distinguish from those due to a mental disorder. In such cases, formal developmental and neuropsychologic testing should be part of the evaluation process. Because of these factors, evaluation of children with a mental disorder is typically more complex than that of adults. However, most cases are not severe and can be competently managed by an appropriately trained primary care practitioner. However, uncertain or severe cases are best managed in consultation with a child and adolescent psychiatrist

Intervention for common mental disorders among adolescents

According to ICD-10, the most common mental disorders of childhood and adolescence fall into the following categories: Anxiety disorders, Stress-related disorders, Mood disorders, Obsessive-compulsive disorder, disruptive behavioral disorders, while schizophrenia and related psychotic disorders are much less common.

There are two types of intervention for common mental disorders among adolescents: medicine and psychological consultation. The medicine can be treated with the collaboration of local health workers. And importantly, the psychological consultation to parents should be applied immediately. There is much overlap between the symptoms of many disorders and the challenging behaviors and emotions of normal children. Thus, many strategies useful for managing behavioral problems in children can also be used in children who have common mental disorders such as consultation to parents some behavior and psychological changes such as time-out technique, consultation and education and strategies for parents.

Helping parents to understand that “discipline” implies structure and not just punishment allows them to provide the structure and clear expectations that children need. Ineffective discipline may result in inappropriate behavior. Furthermore, appropriate management of childhood behavioral problems may decrease the risk of temperamentally vulnerable children developing a fully developed disorder. Also, effective treatment of some disorders (eg, anxiety) during childhood may decrease the risk of mood disorders later in life. These types of intervention can be considered as

The Need of Telehealth in the COVID-19 outbreak context

From 2020, the Covid-19 pandemic has become one of the most serious health crises in the world and in Vietnam. As of 1, November 2021, there were 921,122 cases that resulted in 22083 deaths all among people with underlying health conditions. A method for controlling the transmission of SARS-CoV-2 is social distancing, which is made possible by the reduction of person-to-person contact (8). However, the adverted impact of strict lockdown and social distancing reduced the number of outpatients, especially patients with mild symptoms or mild mental health problem access to the health care services. According to the statistic of the department of Adolescent health, the number of outpatients access to the department of Adolescent health reduced to 92.1% compared to the time before COVID-19 (9).

In the war against the COVID-19 pandemic, the Vietnamese Ministry of Health launched project 2628/Decision of Ministry of Health on June 22, 2020, which approved a scheme for remote medical examinations and treatments for 2020 to 2025 (10). The National Pediatric hospital established the Telemedicine Center in January 2021 and the department of Adolescent health established the phone and teleconference in diagnosis and evaluation common mental disorders and other specific adolescent disorders among adolescents.

This aims of this paper to present the results of applying telehealth in the National Pediatric Hospital which is the largest national hospital in Vietnam in general and in the department of Adolescent health in particular, as well as the advantages and challenges of early-stage telehealth for diagnosis, evaluation and early consultation and treatment of common mental disorders among adolescents in Vietnam.

METHODS

Settings: Department of Adolescent Health was established in 2020. The main objectives of this Department are to provide health services for adolescents in the clinics and in the community. Almost all patients of this department (approximately 90%) are patients who had mental health problems, the rest of patients had other diseases.

Design: this study applied case study design, using secondary data of using telehealth in the Department of Adolescent health of the National Children’s Hospital. The unit of analysis in this case study is using telehealth in diagnosis and treatment common health disorders among adolescents within the Department of Adolescent health.

Research time: We review the secondary data and reports of the Department of Adolescent health from June to October, 2021. Six reports of using telehealth were collected and used in this paper.

Analysis: Secondary data of outpatients was entry to the matrix (table 1) and re-check with the health providers at the Department of Adolescent health.

Ethical issue: this study applied case study using secondary data analysis, therefore, ethical clearance is not required.

RESULTS

Table 1. Application of telehealth in the National Pediatric hospital and how it works in the department of Adolescent health from June to October, 2021

Model	Network	Achievements	Challenges
Tele-diagnosis	Connect via zoom with patients, parents and international experts	<ul style="list-style-type: none"> - 2 difficult cases were discussed and consulted with foreign experts from US via TeleMedicine. - Connect and diagnosis mental problems among adolescents: 50 cases. -Many adolescent patients with psychological problems do not want to go to the hospital such as depression, do not want to travel, so online counseling is more convenient and easier for patients to accept. The patient is then more willing to cooperate, just texting the patient first. There is no distance like in the hospital. -Overcome the difficulty of the health accessibility problems during Covid-19. 	<ul style="list-style-type: none"> -Requires that the patient also have an understanding of information technology or receive instruction in the use of technology. -Not direct, not comprehensive assessment (especially with the cases in need of further laboratory test). -Not suitable for the first visit (because the first examination to make a diagnosis, it is necessary to examine it directly and carefully). -Not suitable for severe patients. For patients with severe degree, especially mental illness, should be examined directly. -For uncooperative children, online diagnosis is sometimes difficult to implement.
Teleconsultation	Connect via zoom with patients, parents and international experts	<ul style="list-style-type: none"> -50 tele-psychological with adolescents. - 218 phone calls to follow up consultation with patients. - 5 tele consultation cases were conducted via zoom to multi-family members of adolescents. 	<ul style="list-style-type: none"> - Requires that the patient also have an understanding of information technology or receive instruction in the use of technology. - Difficult to ensure the security of the information. Users (adolescents and parents) may difficult in using virtual equipment. Some parents and patients hesitate to work with health workers online.

Model	Network	Achievements	Challenges
Telemedicine	Adolescent, patients zalo, phone, zoom and tele-conference with local health workers in monitor patients	Daily support for patients who need the service, including common mental health patients. - In average 8 patients/local health workers per day to cover the instruction of medicine using (increase or decrease doses), monitor the medicine taking (via zalo, zoom app). - Psychological consultation and treatment: in average 2-3 cases per day (via zalo app, phone).	-Requires that the patient also have an understanding of information technology or receive instruction in the use of technology. - More difficult for health worker to observe patients online compare to observe directly. - Not suitable for severe and serious mental disorders cases. The therapist has difficulty responding to emergency situations (eg, attempt suicide). - For uncooperative children, online therapy is sometimes difficult to implement.
Teleconference	MOH Other stakeholders such as medical universities, public health institutions and NGOs	Monthly meetings for direction and management with MOH every two months. Teleconference with International scholars. -organized 1 international teleconference with US scholar. 2 conferences with experts from Belgium and France to share knowledge and medical news dissemination, lesson learning from 2 interesting cases.	- Teleconference used the system of the hospital. Department who want to use teleconference room should register to reduce the overlap with the calendar of other departments. - Some small conferences, zoom can be used within the department. However, health workers who participated in zoom can be distracted .
Tele-mentoring and education	With all provincial pediatric hospital	- 2 tele-conference with local provincial hospitals on diagnosis and treatment. Tele-mentoring became a useful routine for the hospital network: organized 2 tele-mentoring conferences on mental health for local provincial and district hospitals.	Internet connection sometimes disrupted.

DISCUSSION

The strengths and challenges of application of telehealth in diagnosis, monitor progress and early consultation of common mental disorders for adolescents

Strengths

The COVID-19 outbreak has changed the way that people contact and communicate with health workers and the national hospitals. Telehealth is a model that uses electronic information and telecommunication technologies to support and promote long-distance clinical health care, adolescents and professional health-related education, public health care facilities, and health administration agencies. Telehealth technology helps doctors connect children, adolescents and their parents with physicians through video calls, zalo, and web-based patient portals and enables real-time consultations between specialists, in term of within the departments, across department within the National Pediatric hospital, and connection with specialists from other institutions and abroad.

With the characteristic of common mental disorders, the telehealth application is appropriated, cost-effective, comfortable and beneficial for adolescents who need initial diagnosis, evaluation and follow-up care without a physical exam or patients who have nonurgent and have mild symptoms and diseases. The mental health diagnosis often without laboratory test but psychological screening and asking. It also connect the patients in the mandatory isolation place to connect to the health care services during the pandemic. Therefore it can be considered to extend the services of the hospital in the future.

In the Covid-19 context, telehealth is an effective option for supporting the fight against the outbreak of COVID-19, as it

reduces the risk of coming into contact with people with SARS-CoV-2 infection (11). Hospital-acquired infection is a serious problem in Vietnam—a tropical country that has a high risk of nosocomial infection. Telehealth has the advantage of digital health care solutions that can prevent the spread of the pandemic nationwide because they help reduce the amount of direct contact with patients and decrease the risk of infection for health staff, especially in the steps of monitor the chronic patients or provide psychological consultation.

For example, with adolescents who had common mental health problem, the doctor can treat remotely by communicating with the patient via zalo app, zoom or some other means of monitoring. The doctor can monitor the patient taking the medicine every time the patient takes the medicine. The patient will turn on the camera to the doctor, so that the doctor can observe the patient taking the right medicine, the right dose as prescribed, and doctor can make sure the patients complete the treatment duration or not. Physicians also can instruct patients to monitor themselves using a Google form. On the Google form or google calenda, there will be patient follow-up criteria and alert time for patients to take medicine on time. Thereby, patients can have their treatment diary on their own health developments, or they can share their own aspirations. By this way, the doctor will regularly update this information. Thus, the benefits of telemedicine are obvious when it comes to social distancing and decreasing the spread of diseases. There is one thing related to adolescent/ children, the health care workers should connect not only with patients but also their caregivers or parents. On the other hand, the hospital and departments should assign senior health workers to provide telehealth care services rather than junior ones

For tele conference and tele-mentoring: The

information technology system is relatively complete and meet the need of improving the knowledge, qualifications, and abilities of physicians. The teleconference also can be recorded and re-watched.

Challenges

There are some challenges during application of telehealth in diagnosis, monitor progress and early consultation of common mental disorders for adolescents such as internet connection, ethical and secured information, payment and types of mental disorders/diseases. Firstly, internet connection and digital equipment to connect to the telehealth need to be available for patients. Although the internet coverage in Vietnam can be consider quite good, however, during the outbreak period because of the epidemic, sometimes the transmission line is unstable because network congestion is mainly related to personal vehicles. This disrupts communication and sometimes affects the psyche of the patient's family and the patient. Secondly, payment for remote health services is now not available. Because the online diagnosis, treatment and consultation are not accepted, the patients and their family members are completely free. This means that medical staff do it without funding. In the long term, if this online activity is carried out regularly, there should be a source of support for medical staff. Furthermore, the regulation of insurance should be revised in order to meet the need of patients and health workers. Thirdly, difficult to ensure the security of the information, it is possible that the information of the consultant and the patient cannot be absolutely secured, the patient's family member or the psychologist arbitrarily record, save the video without permission. consent of the other party. And finally, for some type of severe mental disorders or emergency cases such as psychiatry diseases or attempt suicide, the telehealth seemed not

to work because the therapist has difficulty responding to emergency situations. The application of telehealth is also not suitable for those diseases in need of laboratory test or the patients who did not visit to the local clinics/hospitals that connect to the telehealth of the National Children's hospital. However, this model is quite better than other telehealth model in others hospital in term of better interaction with patients rather than only within the connectivity among doctors like Phu Tho hospital or other clinical settings (11).

CONCLUSIONS

Telehealth has emerged as a good model of technology for health care services in Vietnam during the COVID-19 pandemic. This report is to provide the early results of early diagnosis, counseling and support activities of remote examination and treatment of common mental disorders activities for adolescents in the National Pediatric hospital in Vietnam. The results from the National Pediatric hospital show the advantages of using telehealth in remote examinations that adhere to the treatment system standards of the Ministry of Health. By applying the telehealth, doctors at higher-level hospitals can shorten the process of diagnosis and treatment of mild common mental disorders for adolescents. The application of telehealth is appropriated, comfortable and benefit for both service providers and adolescents and their parents. It is recommended that the Ministry of Health should develop the policy on health insurance payment and other voluntary payment for the e-health services and the ethical standards for telehealth application within clinical settings in Vietnam. Further research should be conducted to measure the effectiveness of telehealth in other diseases diagnosis and treatment in the future.

REFERENCES

1. World Health Organization and Pan Health Organization. 2019. Mental health. Available at: <https://www.paho.org/en/topics/mental-health>
2. Merikangas KR, He JP, Burstein M, et al. Lifetime prevalence of mental disorders in US adolescents: Results from the National Comorbidity Study – Adolescent Supplement (NCS-A). *J Am Acad Child Adolesc Psychiatry* 49(10):980-989, 2010.
3. Kessler RC, Avenevoli S, McLaughlin KA, et al. Lifetime comorbidity of DSM-IV disorders in the National Comorbidity Survey – Replication Adolescent Supplement (NCS-A). *Psychol Med* 42(9):1997-2010, 2012.
4. Dalsgaard S, Thorsteinsson E, Trabjerg BB, et al. Incidence rates and cumulative incidences of the full spectrum of diagnosed mental disorders in childhood and adolescence. *JAMA Psychiatry*, 77(2):155-164, 2020. doi: 10.1001/jamapsychiatry.2019.3523
5. Caspi A, Houts RM, Ambler A, et al. Longitudinal assessment of mental health disorders and comorbidities across 4 decades among participants in the Dunedin birth cohort study. *JAMA Netw Open* 3(4):e2032210, 2020.
6. Lee PH, Anttila V, Won H, et al. Genome-wide meta-analysis identifies genomic relationships, novel loci, and pleiotropic mechanisms across eight psychiatric disorders. *Cell* 2019. doi: [org/10.1101/528117](https://doi.org/10.1101/528117)
7. Dhossche DM, Wachtel Le. Catatonia is hidden in plain sight among different pediatric disorders: A review article. *Pediatric Neurol* 43(5):307-315, 2010. doi: 10.1016/j.pediatrneurol.2010.07.001
8. Vietnam Ministry of Health. Updated COVID-19 in Vietnam. Available at: <https://covid19.gov.vn/> (achieved 1, November, 2021).
9. National Children’s Hospital. Report on number of outpatients. 2021. National Children’s Hospital
10. Vietnam Ministry of Health. Decision 2628/ BYT on June 22, 2020, which approved a scheme for remote medical examinations and treatments for 2020 to 2025. Ministry of Health, 2020.
11. Nguyen NH, Nguyen AQ, Ha VTB, Duong PX, Nguyen TV. Using Emerging Telehealth Technology as a Future Model in Vietnam During the COVID-19 Pandemic: Practical Experience From Phutho General Hospital. *JMIR Form Res*. 2021 Jun 22;5(6): e27968. doi: 10.2196/27968. PMID: 34078590; PMCID: PMC8221284.