



Learning as the best medicine: Proposal for SMART schooling for hospitalized children

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ABSTRACT

This research paper explores learning alternatives for chronically ill students, considering the challenges they encounter in their learning processes due to prolonged or intermittent absences from school. International practices and recent research findings on this topic will be reviewed in the contexts of hospital schools, SMART hospitals, and SMART learning technologies to highlight their primary characteristics. The current situation of hospitalized students, particularly those in Dubai, will be discussed to propose an alternative education program to aid them: the Edu-Med Care Model. This model is built on SMART education and healthcare approaches to support the goal of helping students overcome barriers that prevent them from accessing conventional learning spaces. The strengths and limitations of the Edu-Med Care Model will be evaluated.

1. Introduction

Children and adolescents with chronic diseases such as asthma, diabetes, congenital heart problems, and cancer have different experiences with education and public health systems which warrant public policy interventions [3]. Currently, children and adolescents with chronic diseases experience exclusion and discrimination regarding access to medical services and in classrooms that lack inclusive education models [13]. In response to this, teachers, medical personnel, and public health experts must make additional efforts to guarantee the rights of all children and adolescents in the learning process. In this case, learning can become the best medicine.

Chronically ill children and adolescents may experience hospitalization, which separates them from home, school, and typical daily activities [20]. This situation can cause delays in their learning processes and attainment of educational milestones [22]. Due to their isolation from the classroom, chronically ill children and adolescents are more likely to have experiences that negatively affect their learning, emotions, and socialization [10]. For example, these children and adolescents may experience instability in their friendships, impacting their confidence, self-esteem, motivation, and desire to study while distanced from the classroom [15].

The current situation of children with chronic diseases in the educational system worldwide is widely discussed. Firstly, children with chronic illnesses may be absent from class frequently and are more likely to drop out of school [17]. Secondly, chronically ill children and adolescents may need to repeat grades due to prolonged absences from school. Thirdly, they may lose contact with loved ones for significant periods, causing anxiety and depression that require mental health care [17].

Consequently, chronically ill children and adolescents intersect the health system and the educational system. Conventional public programs and policies are not designed to support students in coping with their illness, learning, and sustaining social interaction with students at school [21]. More inclusive education models are needed to improve the psychosocial component of hospitalization so that

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chronically ill children and adolescents can retain their rights to both education and health.

This research paper explores learning alternatives for chronically ill students in Dubai, considering the challenges they face in their educational process due to prolonged and intermittent absences from school. At the outset, international practices and recent research findings on this topic will be reviewed in hospital schools, SMART hospitals, and SMART learning technologies. Subsequently, solutions will be discussed and recommended in the context of Dubai's medical service and educational institutions to integrate mobile technology as a connecting mechanism between the student and the classrooms. Finally, practical implications in terms of cost and benefit, demand and supply, and educational policy will be discussed to propose an alternative program: the Dubai Edu-Med Care Model.

This research and intervention proposal targets chronically ill students who are inpatient or outpatient, inside and outside the United Arab Emirates, who receive treatment causing prolonged and intermittent absences from school. This research does not include special educational needs (SEN) students.

2. International experiences and research evidence concerning educational programs for chronically ill children

It is hugely important to create educational initiatives to teach chronically ill students globally. Many children and adolescents worldwide suffer from chronic health issues like cancer, asthma, hemophilia, diabetes, and other autoimmune conditions. These illnesses often hinder or prevent these individuals from attending traditional schools or receiving a high-quality education. Educational initiatives to provide chronically ill students with an opportunity to access quality learning experiences can help bridge this gap and improve their overall well-being.

These initiatives have numerous positive impacts. To begin with, students who participate in these programs gain valuable skills and knowledge that might otherwise be unavailable due to their illness and limited physical mobility. They allow students to keep up with their peers academically by helping them stay on top of the latest classroom trends despite their health circumstances. Furthermore, these initiatives can foster a sense of camaraderie among chronically ill students by connecting them with others who share similar experiences and struggles on a global level.

In addition to providing educational opportunities to chronically ill students, there have been tremendous efforts to create support systems for families dealing with chronic illnesses. This involves providing resources like counseling services, medical advice and guidance, financial assistance, supportive communities of peers and mentors, and other forms of emotional aid that can make life easier for those dealing with long-term health issues.

Implementing global educational initiatives for chronically ill students is inspiring and will continue to pay off tremendously in the coming years. These programs offer much needed academic support to those affected by chronic health conditions and create stronger connections between people around the world living through similar situations. They also provide resources to the families involved by offering valuable information and support networks to help cope with their current reality. In short, creating educational initiatives for chronically ill students on a global scale represents a tremendous effort that has already improved countless lives across the globe and will continue doing so in the future.

Table 1 shows innovative teaching initiatives for chronically ill students according to country and year of development.

2.1. Hospital schools

The current research analyzes conventional options to meet the educational needs of children and adolescents with chronic diseases. To cater to chronically ill students, hospital schools have been created. A hospital school is a primary and secondary grade-level institution within a hospital, typically a children's hospital [20]. These schools enable children to keep up with their academic progress despite hospitalization or rehabilitation [16]. Most hospital schools are accredited by the state and run by the local public school system, which is paid for with public resources. Within these systems, the curriculum and testing required by the state are as relevant to students as possible.

In hospital schools, children are specialized healthcare patients requiring highly specialized medical treatment [5]. Hospital school teaching follows general practices that help students recover and improve their well-being. The learning goals and objectives are determined individually and revised regularly because health, condition, and length of medical treatment can change frequently. Cooperation with nursing personnel and parents is crucial in a hospital schoolteacher's work [2].

In Finland, the law of basic education states that county-level hospitals must provide schooling for school-aged children [1]. Children who are hospitalized and unable to attend their own schools go to a hospital school. For hospitalized students, teaching is

Table 1
Educational initiatives for chronically ill children globally.

Year	Country	Type of Initiative	Name of Initiative
1994	Brazil	Hospital schools	Brazilian hospital schools
1994	Finland	Hospital schools	Finlandia hospital schools
2017	Australia	Hospital schools	Monash Children's Hospital School
2017	China	Smart schools	Samsung Smart School at Kaohsiung Medical University Chung-Ho Memorial Hospital
2018	United States	Homebound schools	Michigan Public School Pupils
2018	Australia	Smart schools	wellCONNECTED
2018	Australia	Smart schools	Interactive Whiteboards (IWBs)

arranged in, for example, child psychiatric, neurological, and phoniatrics wards. Many children attend hospital school as outpatients from their own homes.

In 1994, the Brazilian Ministry of Education formalized education in hospitals to avoid systematic interruptions in children's education [6]. Hospital classes help children and adolescents who are enrolled in mainstream education systems by ensuring they have a good relationship with their schools. This can be done through either a flexible or adapted curriculum, which helps students adjust when they first enter school, when they return to school, or if they are not doing well in their current school group.

Another example is the Australian Monash Children's Hospital School, a Department of Education and Training school located in the new Monash Children's Hospital. The Monash Children's Hospital School is a co-educational specialist school that was created to educate children who are currently hospitalized and receiving outpatient treatment. This hospital school also delivers educational services that are tailored around the constraints of treatment, recovery, and reintegration [12].

Chronically ill children in Melbourne can attend this hospital, which has \$6.8 million AUD in funding and the capacity to serve 170 students [25]. This hospital school accepts children and adolescents with chronic medical and mental health issues who are considered "at-risk" or disengaged from the education system [12]. Students who are unable to attend regular school are also included in Monash Children's Hospital School. In these hospital school facilities, teachers deliver classes at students' bedsides, in small activity rooms, and in central ward areas designed for teaching. Additionally, the classrooms feature hot-desk areas and are equipped with cameras and the latest technology to enable students to connect virtually with teachers and classmates at their regular school and with their families at home.

Although the educational model in Monash Children's Hospital School is remarkable, there are inevitable challenges at the intersection between health and education. Initially, teachers in the hospital found it challenging to integrate hospital and school politics and procedures. They did not have specific knowledge about the current demand for their service. Compounding this, information regarding the cohort of patients accessing the service is unknown, enrollment is low compared to traditional schools, and teachers must provide instruction for many grade levels. Sometimes, hospital teachers cannot cover every subject, especially for middle and high school students taking advanced courses. Undoubtedly, this situation is not ideal for instructing chronically ill children. Lastly, improvements in medical treatments mean that chronically ill children spend significantly less time in hospitals and longer periods recuperating or receiving treatment at home. This has reduced the impact of hospital schools.

2.2. Homebound schools

Many school districts have established hospital homebound or hospitalized instruction programs where teachers visit chronically ill students at home or at the hospital twice or several times per week according to the requirements of relevant regulations. According to Shaw et al. homebound schools are considered for students with chronic illnesses who are at risk of academic or social problems [20]. This risk is exacerbated when students are unable to attend school in the short or long term due to medical conditions. In this case, education can decrease the risk through effective inbound instruction. Homebound schools can be effective in closing gaps and exclusions for chronically ill students when interdisciplinary and community coordinated education involving policy, inclusion, and the knowledge of educators, medical practitioners, and parents are included.

Homebound schools provide an important educational service for chronically ill students in the United States, guaranteeing their right to an education. Consequently, they are a best practice in inclusive education. Many chronically ill students find that attending a regular school is impossible due to their medical conditions. Homebound schools provide virtual classes that are easily accessed from home, so students can continue their education without leaving the safety of their homes. These schools also offer specialized educational materials and tutoring services specific to each student's condition. Homebound schools bridge the gap in quality between classroom instruction and remote education, while protecting the right to education for chronically ill students.

For instance, in Michigan Public School Pupils, homebound and hospitalized services provide educational services for students with medical conditions that prevent them from attending school during the year. According to the law, the pupil's inability to attend school due to a chronic illness must be certified by a physician [11]. Also, homebound, and hospitalized services are designed to be a self-study program that allows students to keep up with their coursework and studies while they are unable to attend school. These services allow the classroom teacher to work through the homebound and hospitalized teacher to distribute course materials, deliver instruction, and monitor the pupil's progress in the course.

Michigan Public School Pupils is regulated by Section 109 of the State School Aid Act (MCL 388–1809) of the United States, which provides the legal requirements for homebound and hospitalized services for all pupils. Administrative Rules 340.2(11) and 340.2(12) provide the membership requirements for homebound and hospitalized services for all pupils. Homebound and hospitalized services programming for pupils with an individualized education program (IEP) must meet specific requirements in the *Michigan Administrative Rules for Special Education* at R 340.1746 [11].

Typically, homebound instruction institutions face challenges. Although teaching is provided, chronically ill students often feel homebound instruction is a poor substitute for real school [4]. The limitations are not only academic, but also social. The maintenance of friendships and the feeling of belonging to a community at school may be more important than academics. The social involvement aspect, defined as the involvement of long-term or chronically ill children with all informal and social activities at the school where the child went before school absence, cannot be provided through current hospital homebound or hospitalized instruction programs [19].

Homebound schools provide an invaluable service for chronically ill students in the United States, ensuring they maintain their right to an education [14]. Best practices for these schools include providing virtual classes that can be accessed from home, tailoring educational materials or tutoring services to each student's condition, and offering a quality learning experience that is equivalent to what traditional school settings provide. With effective implementation of these best practices, homebound schools can ensure that

chronically ill students receive an adequate education while remaining safe in their own homes.

2.3. Hospital-provided learning

SMART hospitals are based on the Internet of Things (IoT) and constructed with application service systems. This a cutting-edge kind of hospital that integrates technologies to provide proper diagnosis, treatment, management, and decision-making about diseases [7]. Given the known adverse effects of hospitalization on children and adolescents, these hospitals offer psychosocial care, classrooms, and equipment for learning. In SMART hospitals, bedside teachers are hired and rotated across hospitals.

The introduction of the Samsung Smart School at Kaohsiung Medical University Chung-Ho Memorial Hospital in 2017 has been a game-changer for chronically ill children, providing them with greater educational and healthcare access than ever before [18]. This cutting-edge facility is designed to assist these vulnerable children in their pursuit of knowledge while creating a safe and stimulating environment that encourages their physical and mental well-being.

The Smart School provides two classrooms equipped with tablets and TVs that allow students to learn through interactive apps that are tailored to their individual needs. The school also works with hospitals, social workers, volunteers, art therapists, and other relevant parties to provide children with access to the best possible resources. It even employs expert teachers who specialize in educating chronically ill children.

The Smart School's physical design helps create an inspiring atmosphere for learning. The rooms feature large windows that fill them with natural light to make them inviting places to be during the day. Furthermore, they are equipped with adjustable furniture so that children can move around freely without worrying about being uncomfortable or restricted by traditional classroom seating arrangements.

Moreover, the Smart School works towards giving chronically ill children a sense of normalcy by allowing them to interact with other students who may not be suffering from similar ailments. This promotes a sense of community while engaging the student's social skills and reducing feelings of isolation or exclusion from mainstream society.

Finally, the Samsung Smart School offers medical care provided by experienced professionals such as doctors, nurses, and pediatricians. This ensures that any health issues faced by students can be quickly identified and treated appropriately so that their education does not suffer as a result. First aid kits are conveniently located around the school building for easy access if needed.

It is apparent that this innovative facility has benefitted chronically ill children attending Kaohsiung Medical University Chung-Ho Memorial Hospital since its opening in 2017. Its combination of educational tools and healthcare services allows these students to pursue knowledge without their health being a hindrance, so they can reach their full potential despite their difficult circumstances.

2.4. SMART applications for the education of chronically ill students

The widespread use of computers, Internet, interactive multimedia and other ICT communication tools has profoundly affected education. Teaching and learning are becoming less dependent on physical location, and the number of resources available to students outside the classroom has increased dramatically. The locus of control to initiate educational encounters has passed to the learner, and SMART technologies are being used to help students maintain social and academic links with their schools during hospitalization, treatment, and recuperation at home. These include mobile telephone conversations and texting, emailing, web-based interaction, Internet chat room discussions, videoconferencing, and synchronous technology. The implications of these changes are far-reaching and continue to evolve as new technologies emerge. However, one thing is clear: the landscape of education is being transformed by the ubiquity of ICT tools.

In Australia, a program has been designed to use synchronous real-time technology to connect them live to the classroom in recognition of the need to improve educational support for chronically ill students [26]. Those programs established that ICT links between home and school enable autonomy and individualized learning for students. For students unable to attend school, such communication strategies are vital for maintaining social and educational contact and involvement. The use of shared online whiteboarding allows pupils to participate in tutoring sessions. Teachers can share and provide immediate feedback, while students work with fellow classmates on math problems in a live setting.

The first application of SMART technologies in education for chronically ill students in Australia was a project known as Well-CONNECTED, initiated by the RCH Education Institute in Victoria, Australia [26]. Its purpose was to investigate ICT's effectiveness in supporting students with chronic illness through connections with their schools of origin. The web-based connection was established by the use of a virtual classroom package called 'Manhattan,' through which 20 students and their schoolteachers maintained contact with each other.

Although it is capable of much more, Manhattan was used mainly for email contact with teachers and classmates and to complete assignments and tests. In a detailed evaluation of the pilot project, teachers' inadequate ICT skills turned out to be a major problem. Only a few teachers were able to use Manhattan effectively. Teachers reported that their workloads were too high to invest the time needed to master the ICT skills required for Manhattan. They also felt that they could not justify allocating so much time and attention to the support of only one student. Students, however, were positive, reporting that they felt more motivated to succeed.

Another application was the Back on Track Project. The Back on Track Project is a continuation of the services provided by the RCH Education Institute in Australia. The RCH refers school-aged children with cancer to Back on Track education advisors. Their main role is to provide advisory support, which includes responsibilities such as organizing meetings with schools, overseeing the provision of laptops and Internet access, and suggesting avenues of communication between school, hospital, and home. Adobe® Connect™ is used as an Internet-based communications system. This system helps maintain contact between the child, their family, and their teachers

while receiving treatment. As a result, the Back on Track Project provides crucial support for children with cancer and their families.

Furthermore, interactive whiteboards (IWBs) can be understood as an example of SMART technologies applied to education for chronically ill students. IWBs have been gaining popularity in recent years as a tool for enhancing classroom instruction. When used in combination with videoconferencing, they offer the potential to provide effective application and file sharing between classrooms. This would allow students who are absent from class to participate in key learning opportunities by accessing visual information, notes, interactive applications, and graphing demonstrations online. Moreover, the wireless microphone would enable them to hear teacher and peer discourse. This would be an effective way for absent students to catch up on what they missed in class and ensure that they do not fall behind. Ultimately, this would lead to better outcomes for all students involved.

In summary, although hospital schools and other conventional educational provisions for hospitalized children have faced challenges, recent technological advances have created new opportunities for providing effective education to these students. Smart technologies such as visual classroom systems can help address the issue of absent students by allowing them to access the learning and interaction occurring in class. These technologies can also help improve communication between teachers and students. By incorporating these new technologies into hospital schools and other educational provisions for hospitalized children, we can develop more effective and innovative ways for these students to learn.

3. Current educational provisions for chronically ill students in Dubai

With the rapidly growing number of hospitals in Dubai, one would expect a corresponding increase in facilities and programs to support the educational needs of hospitalized children [9]. However, this does not seem to be the case. There appears to be no hospital school in Dubai nor minimal hospital-provided learning for chronically ill students. In addition, no law or policy specifies hospitalized students' rights in terms of the provisions for school-provided hospital homebound or hospitalized instruction programs. As a result, the educational needs of hospitalized children are not being adequately met. The lack of a coordinated approach to educating hospitalized children is a missed opportunity to provide quality care and improve learning outcomes.

According to the 2017 Annual Healthcare Statistics Report, there were 76,963 inpatient visits to DHA hospitals that year, primarily in the specialties of pediatrics, pediatric surgery, general surgery, urology, neonatology, hematology and oncology, and diabetes [27]. However, the number of inpatient school-aged children may not represent those whose medical conditions are recurrent or result in prolonged and intermittent absences from school. SMART healthcare models are starting to be implemented in Dubai, and they can potentially address the educational needs of chronically ill children and adolescents. This project is worth Dh250 million and has three main parts: smart applications, operations, and hospitals [8]. This includes the implementation of EMR (electronic medical records) and a HIS (hospital information system).

Although the utilization of technology is well-researched in the case of chronically ill students with specific educational needs globally, a solid background is needed in the UAE and the Emirate of Dubai. It is necessary to obtain more accurate statistics to show how many children have chronic illnesses, the growth rate of chronic illnesses, and which diseases are most common. Information on the number of children with chronic illnesses needing special education is important in order to make a sound proposal for policy change.

A systematic investigation of the needs of long-term or chronically sick children regarding their education is a must. In addition, rigorous research on the current provisions, facilities, programs, and policies of hospitals and schools in Dubai for long-term or chronically sick children in Dubai is needed. Currently, there are no comprehensive, evidence-based recommendations for school reintegration, placement, or support among children. Therefore, a usability study is necessary to examine the extent to which potential ICT systems can effectively engage with chronically sick children in the context of Dubai.

4. Discussion of alternatives

There are alternatives to attend to the educational needs of chronically ill children and adolescents in the Emirate of Dubai. In this research paper, we discuss four: (1) establishing a hospital, (2) enhancing school provided by homebound or hospitalized instruction programs, (3) improving hospital-provided learning, and (4) creating a new school-led SMART technology-based model.

4.1. Hospital schools in Dubai

Implementing hospital schools in Dubai has many benefits. One of these is that it provides formal, accredited education. This means that students will receive a quality education that is recognized by the government. Additionally, hospital schools are part of the public education system. Consequently, they are subject to the same standards and regulations as other schools in the UAE. Hospital schools offer a flexible, practical, and adapted curriculum. This means that students can receive an education that is tailored to their needs and abilities. As a result, hospital schools would be an invaluable resource for chronically ill students in Dubai.

There are several points to be considered associated with implementing home schools in Dubai. Firstly, medical care is the priority, which can lead to ineffective delivery of education. Secondly, the range of subjects offered and covered by hospital teachers is often limited. Third, the cost of establishing and running a home school can be high. There may be difficulties integrating both hospital and school policies. Finally, it is worth noting that chronically ill children spend significantly less time in hospitals than they used to and receive treatment at home for longer periods. This raises challenges for implementing home schools in Dubai.

Despite the potential challenges of implementing home schools in Dubai, there are several opportunities that should be considered. One of the biggest opportunities is the potential for close collaboration between hospitals and schools. This would allow students to

receive the best possible care and education while they are away from their usual school environment. Additionally, SMART technologies could be used to connect students with their homes and previous classes, which would help to make the transition back to school smoother. Overall, there are some challenges that need to be addressed but implementing home schools in Dubai could provide significant benefits for students and families.

4.2. Homebound or hospitalized instruction programs in Dubai

Homebound or hospitalized instruction is a vital service that schools must provide to students to ensure continuity of learning. When students are unable to attend school due to illness or other medical reasons, homebound or hospitalized instruction allows them to receive the necessary educational services. In Dubai, establishing or enhancing these programs would create numerous benefits. First, it would allow for a more school-centered approach with access to available expertise and resources. Second, it would provide students with a sense of continuity and belonging. Ultimately, this would lead to better educational outcomes for students who require homebound or hospitalized instruction. As such, establishing or enhancing these programs would be highly beneficial for students in Dubai.

However, one of the key weaknesses of homebound or hospitalized instruction programs is that students are still isolated from the school and classroom context. This can have a negative impact on their social and emotional development. Additionally, these programs are primarily self-study, which can be less effective than traditional instruction. They are also relatively costly for schools to implement and maintain. Finally, homebound or hospitalized instruction is often mandated by law and government regulations, which can make it difficult to improve. However, there are some ways to overcome these challenges. For example, SMART technologies can be used to improve the quality of instruction and make it more engaging for students. Additionally, schools can partner with community organizations to provide supplemental support for students in these programs. By working together, we can ensure that all students have access to a quality education.

Lastly, providing homebound or hospitalized instruction to students in Dubai requires extra effort by teachers and good communication between school personnel and parents. These efforts are necessary to ensure that students have the opportunity to learn while they are away from school. Homebound instruction involves educating students who are unable to attend school due to illness or injury. Hospitalized instruction refers to educating students who are hospitalized for an extended period. These programs allow students to keep up with their studies and make progress toward graduation. To be successful, these programs require the commitment of all parties involved. Teachers must be willing to put in the extra effort required to prepare and deliver lesson plans. Parents must be willing and available to support their child's learning at home. School personnel must be willing to facilitate communication between all parties involved. By working together, we can ensure that every student has the resources to succeed in education.

4.3. Improving hospital-provided learning in Dubai

Hospital-provided learning in Dubai could be enhanced by utilizing SMART technologies. These technologies would provide a structure and process for improvement that is currently lacking. Additionally, they would allow for tracking and data collection, which would be beneficial in understanding the needs of the students and what areas need improvement. The current system is school-centered, with available expertise and resources often mandated by law and government regulations. While this is beneficial, it does not allow the students to meet their full potential. Introducing SMART technologies would create opportunities for students to learn more independently and at their own pace. It would also promote a sense of continuity and belonging as they could form connections with others using the same technology. In conclusion, SMART technologies have the potential to greatly improve hospital-provided learning in Dubai by providing a more individualized and effective approach.

Dubai is home to many top-tier hospitals that provide excellent clinical training for medical students worldwide. However, some weaknesses and threats to this system should be considered. Inherently, students are isolated from the school and classroom context. This can make it difficult to apply concepts to a real-world setting. Furthermore, the program is primarily self-study, so students may not get the same level of interaction with faculty as they would in a traditional classroom setting. These issues can result in students feeling disengaged and uninterested in their studies. Moreover, the program is relatively costly for schools, which may limit its availability to only the most elite institutions. Finally, good communication and collaboration between school, teachers, and parents is necessary for this system to be successful.

4.4. A new school-led SMART technology-based model

There are many benefits to implementing a new school-led SMART technology-based model instruction for chronically ill students in Dubai. To start, this type of instruction is school-centered, which means that the student will have a strong connection to their school and continuity with their peers. Additionally, the flexible curriculum and virtual classroom environment provided by SMART technology will give students more options and opportunities to learn. Finally, this type of instruction has been shown to be effective in reducing absenteeism and increasing academic achievement for chronically ill students. Implementing a new school-led SMART technology-based model of instruction for chronically ill students in Dubai is an exciting and promising opportunity that can provide many benefits for students.

Although the proposed school-led SMART technology-based model of instruction for chronically ill students in Dubai has several weaknesses and threats, it also has the potential to be highly successful. One of the key challenges will be ensuring a high level of

cooperation between the school, hospital, and parents. Another challenge will be ensuring that teachers are technology-ready and able to use the new instructional model effectively. Finally, it is important to conduct reality checks and background research to ensure that the new instructional model is feasible and will meet the needs of chronically ill students in Dubai. With careful planning and implementation, the proposed SMART technology-based instructional model can potentially improve educational outcomes for chronically ill students in Dubai.

5. The Dubai Edu-Med Care Model

In this research paper, this new school-led SMART technology-based model is proposed: the Dubai Edu-Med Care Model. This model is oriented by many guiding principles, including: (1) comprehensive and child-centered, linked to the mainstream education system, and focused on the individual learning needs of chronically ill children; (2) school-led but coordinated by designated education professionals, with clear communication channels between health care professionals, education professionals, the student and the family; (3) utilizes state-of-the-art SMART technologies to effectively deliver the education and keep the student connected to learning and peers; (4) flexible, easily accessible, continuous, responsive, and able to be delivered in a range of settings including the hospital, school, home and community spaces; (5) provides opportunities for social and emotional support as well as peer connectedness to address the aspect of social learning; and (6) has options of providing appropriate direct academic support to the student. The target population of this model is students enrolled in a public school in Dubai (from KG1 to grade 12) who have medical conditions that require treatment resulting in prolonged and intermittent absences from school of five days or longer.

5.1. The operational model of the Dubai Edu-Med Care Model

The Dubai Edu-Med Care Model is an innovative model that merges traditional education with medical care. With this model, chronically ill students can continue their education while receiving treatment. The school where the student is enrolled takes the lead in providing continuous education for the student while working closely with the health provider and other community organizations as needed.

A virtual classroom environment is made available to these students, which allows them to continue their education remotely. This is especially beneficial for students receiving treatment at a hospital or home. A virtual school is also proposed as a means to further facilitate the provision of a virtual classroom and other relevant communication technologies. The development of this model is consistent with the current trend of expanding access to education by using new technology-based models.

Also, Edu-Med Care is delivered mainly through ICT communication tools, facilitated and supplemented by real, face-to-face teaching by teachers from the school. The child's education and learning needs are highlighted in this principally education-focused model, which is different from the traditional medical-focused model, as well as the roles of schools, educators, and the home as important sites of service provision for children managing chronic illnesses.

5.2. Technological requirements

The Edu-Med Care Model requires ICT-based tools for various communication modes. Students can choose between live video conferencing, chat rooms, asynchronous forums, audio links, audio messaging, and video messaging. Also, a virtual learning environment is required for teaching. For instructional aims, synchronic applications seem crucial. These applications need sufficient audio and video quality to offer the child access to a wide variety of instructional media.

The remote student should understand the classroom radio clearly and be able to watch the classroom television and blackboard. iPod technology can be used as a communicative tool to provide academic and social support for chronically ill students, open a window into the classroom, and provide opportunities to communicate with their teachers and peers. This provides another way to minimize the impact of prolonged absences from school on learning. Skype could be used to link the student to his or her own classroom. Technology-based contact tools depend on computer and internet access in the classroom, at home, and at the hospital.

5.3. Roles in the Edu-Med Care Model: school, hospital, parents, and authorities

Roles in the Edu-Med Care Model are assigned according to the school, hospital, and home. The roles of schools include providing the following:

- Normalcy, purpose, long-term goals, and social connection.
- Instructional involvement, which is crucial to assure later academic achievement and a smooth school re-entry after an absence.
- Individualized education plans that integrate learning, treatment management, disease adjustment, and health-promoting behavior. Many children with chronic illnesses do not immediately fit into any pre-established programs in school.
- Pro-social programs that promote healthy relationship building with peers. Classroom teachers can educate peers about the illness and coach students on how to be a friend to the sick child. Examining and strengthening school policies related to peer victimization can create a caring environment that will offer psychosocial benefits for students under the stress of treatment for chronic illness.

Additionally, it is essential to promote teacher awareness. Teachers' lack of information and understanding of the impact of chronic childhood illness is a prevalent problem that can result in inaccurate appraisals of a child's symptoms and academic and social skills.

Moreover, enhancing teachers' technological readiness would improve the Edu-Med Care Model. The effective use of technology to link an absent student to learning opportunities in their classes relies heavily on the teacher's ability, confidence, and willingness.

Education may not be a high priority when a student is very unwell, but school programs linked to hospital programs play an important role in promoting socialization and interaction with peers, providing routine. A positive educational outcome is more likely when a partnership exists between education and health services and the student and their family. The cooperation of medical and school personnel can lead to thoughtful planning that supports the parents and child dealing with the illness, particularly when the child returns to the school setting. This involves more training, including pre-service and in-service, to help educational personnel understand how to handle the situation. Programs that integrate health and educational needs must begin with a written protocol after diagnosis for each individual child.

Finally, parents play a key role in advocacy for their children. Parents are the most knowledgeable about their children's needs, so equipping them with resources and channels for advocacy will strengthen the support network for children with chronic illnesses.

The education and health authorities should work together to develop relevant supporting regulations, policies, procedures, and programs to guide all practices and outline essential roles and responsibilities, including proposing laws and regulations defining the rights of hospitalized children and educational provisions. In addition, authorities can prepare policy guidelines and documents and design supporting programs.

5.4. Strengths and limitations of the Edu-Med Care Model

This model outlines a comprehensive approach to addressing the issues of scheduling, isolation, and individualized care requirements for each student. The Edu-Med Care Model seeks to foster communication between teachers, healthcare staff, parents, and students. The model considers the social, academic, and logistical components of educating children who are in and out of hospitals and medical treatments. Furthermore, it aims to obtain top-down protections for these students through legal, educational, and healthcare authorities. It may be difficult to achieve legal codification for the implementation of this model or its methods. The UAE has existing SMART programs and funding for chronically ill students as well as laws protecting inclusive education for those with disabilities [23]. People of determination, defined as those "suffering from a temporary or permanent, full or partial deficiency or infirmity in his physical, sensory, mental, communication, educational or psychological abilities" have the legal right to "inclusive education at every stage" [24].

However, the quality of this inclusive education is not up to the standards of the Edu-Med Care Model. The academic results of existing hospital education systems could be compared against a test group employing the Edu-Med Care Model to quantitatively demonstrate efficacy of the model. Quantitative data will provide a clear, concise demonstration of value and impact. A huge limitation in rolling out the Edu-Med Care Model is the cost of providing technology devices as well as employing teachers, tutors, administrators, and medical staff to fill an unconventional and demanding schedule. However, with government funding, it is possible.

The primary drawback of the Edu-Med Care Model stems from its main appeal. It is an ambitious, nuanced, and highly individualized approach to education for chronically ill students. The model requires large investments including technological devices, technological support, administrative planning, teacher training, and staffing. The stakeholders include students, parents, teachers, tutors, administrators, medical staff, hospitals, and schools.

Three elements of connection are required to successfully implement the Edu-Med Care Model: hospital-school communication, coordinated hospital-to-school transition, and parent-educator relationships. If mismanaged, the complexity of managing all these channels can lead to communication problems. It is important to invest in training for medical staff and teachers, so they are comfortable with the technology used for communication and teaching. This model calls for leadership and planning, particularly in its first iterations. The system demands collaborative working relationships between hospitals, schools, parents, families, and other stakeholders to succeed. The macro level of partnerships between schools, hospitals, and government would be best served by a leader with existing connections or experience with institutional stakeholders when first implementing those relationships. The micro level of day-to-day work will require ongoing administrative coordination, training, and numerous staff members for each child.

The final limitation of the Edu-Med Care Model is that no virtual program can substitute the social experience of face-to-face interaction. This model does address the socialization concern with virtual and SMART solutions, but students are still likely to encounter feelings of isolation and disconnection. However, there is currently no other realistic option beyond video conferencing and online chatting in the case of hospitalized children, so these remote solutions are the best avenue for casual interactions.

If executed well, students will be given the support they need to keep up with their education while battling chronic illness. It is important to highlight factors which will determine the success of Edu-Med Care. Firstly, the school where the student is enrolled has mainstream ownership, meaning that the school continues to take responsibility for the student's overall educational journey. Also, flexibility is crucial. Educational services must adapt to the individual's changing needs and circumstances. To be effective, responsiveness is required. The ability of the hospital and home schools to quickly respond to the changing needs of key stakeholders, including students, parents, teachers, and healthcare staff, will be essential to the success of the program.

6. Conclusion

This research explored educational alternatives for chronically ill students in Dubai, considering the challenges they face in their learning process due to prolonged and intermittent absences from school. Initially, international practices and recent research findings on this topic were reviewed in the context of hospital schools, SMART hospitals, and SMART learning technologies. Additionally, solutions were discussed and recommended in the context of Dubai's medical service and educational institutions to integrate mobile

technology as a connecting mechanism between the student and the classrooms. Finally, the Dubai Edu-Med Care Model was proposed as an alternative social program to attend to the educational needs of chronically ill students.

Chronic illness can have a significant impact on a child's schooling. It is just as important to be aware of the potential barriers to success as it is to support the educational needs of these children. Chronic illness can greatly impact a child's attendance and ability to participate in school activities. Due to this isolation from school, chronic illness can generate feelings of loneliness and social avoidance, as well as problems with concentration and focus. Therefore, SMART technologies, pro-social programs, and remote peer communication options for students can be a key aspect of student wellbeing. It is critical for teachers to collaborate closely with medical providers and parents to create a customized approach that is suited to each student's specific needs.

Additionally, ICT technologies can play a key role in providing synchronous and asynchronous educational support for students with chronic illnesses. We can help guarantee that all children receive the opportunity to reach their full potential by leveraging these technologies. Finally, an examination of socialization, academic achievement, motivation, absenteeism, and district support provides helpful information for all stakeholders who wish to create supportive environments for students with chronic illnesses.

Author contribution statement

Karima Almazroui: Analyzed and interpreted the data; Wrote the paper.

Data availability statement

Data included in article/supp. material/referenced in article.

Additional information

No additional information is available for this paper.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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