مؤسسة قطر
Qatar Foundation

WISH
مؤتمر القمة العالمي للابتكار في الرعاية الصحية
World Innovation Summit for Health

Adolescent overuse of digital technology:
Perspectives of parents, adolescents, and practitioners in Qatar

Sanaa Al-Harahsheh
Azza Abdelmoneium
Ahmed Baghdady
Raian Ali
Maryam Al-Khalaf
Fatima Al-Motawaa
Technology & Behaviour Research Group (i-Solouk), HBKU

وايز
WISE

مؤسسة قطر
Qatar Foundation
Unlocking human potential لإطلاق قدرات الإنسان

جامعة حمد بن خليفة
HAMAD BIN KHALIFA UNIVERSITY
عضو في مؤسسة قطر
Member of Qatar Foundation

DIFI
معهد الدوحة الدولي للأسرة
Doha International Family Institute
البحوث لدعم السياسات الأسرية
Research to advance family policies
Member of Qatar Foundation عضو في مؤسسة قطر

Al-Harahsheh S. Abdelmoneium A. Baghdady A. Ali R. Al-Khalaf M. Al- Motawaa F. Technology & Behaviour Research Group (i-Solouk) HBKU. Adolescent overuse of digital technology: Perspectives of parents, adolescents, and practitioners in Qatar. Doha, Qatar: World Innovation Summit for Health, 2023.

ISBN: 978-1-913991-35-7

Adolescent overuse of digital technology: Perspectives of parents, adolescents, and practitioners in Qatar

AUTHORS

Sanaa Al-Harahsheh, PhD, Research Manager, World Innovation Summit for Health, Qatar Foundation

Azza Abdelmoneium, PhD, Family Research Expert, Doha International Family Institute, Qatar Foundation

Ahmed Baghdady, EdD, Manager, Research and Content Development, World Innovation Summit for Education, Qatar Foundation

Raian Ali, PhD, Professor at College of Science and Engineering, Hamad Bin Khalifa University, Qatar

Maryam Al-Khalaf, MBA, Research Associate, World Innovation Summit for Education, Qatar Foundation

Fatima Al-Motawaa, MA, Research and Grant Specialist, Doha International Family Institute, Qatar Foundation

Technology & Behaviour Research Group (i-Solouk), Hamad Bin Khalifa University, Qatar

TABLE OF CONTENTS

LIST OF ABBREVIATIONS	06
FOREWORD	07
EXECUTIVE SUMMARY	09
CHAPTER 1: INTRODUCTION	11
CHAPTER 2: LITERATURE REVIEW	13
CHAPTER 3: METHODS	21
CHAPTER 4: FINDINGS	25
CHAPTER 5: DISCUSSION AND POLICY RECOMMENDATIONS	78
CHAPTER 6: CONCLUSIONS, LIMITATIONS, AND FUTURE WORK	84
ACKNOWLEDGMENTS	86
PARTNER ORGANIZATIONS	87
REFERENCES	89
APPENDICES	96

LIST OF ABBREVIATIONS

ADHD	Attention Deficit Hyperactivity Disorder
AMAN	Protection and Social Rehabilitation Center, Doha
BDI	Beck Depression Inventory
CHPDH	Center of Health Protection of the Department of Health, Hong Kong
DA	Digital Addiction
DAAM	Behavioral Health Support Center, Doha
DSM-5	Diagnostic and Statistical Manual of Mental Disorders
IA	Internet Addiction
IAT	Internet Addiction Test Questionnaire
IGD	Internet Gaming Disorder
MENA	Middle East and North Africa
PIU	Problematic Internet Use
PYDQ	Parental Assessment of Adolescent Problematic Internet Use
TBA	Technology (Behavioral) Addiction
WHO	World Health Organization
WIFAQ	Family Consulting Center, Doha

FOREWORD

Only two decades ago, communications and information technology were nowhere near what we see today. We are adopting new technological innovations at an unprecedented rate. We create new accounts, subscribe to new services and download new apps almost weekly. We monitor our blood pressure using smart wearable devices and take pictures of our food to determine how many calories there are in a meal.

As we become increasingly dependent on technology, it is important to understand how this dependency might negatively affect society and adolescents, in particular. The level of attachment to, and overuse of, technology among this age group is alarming.

Throughout 2020 and 2021, representatives of the World Innovation Summit for Health (WISH), the Doha International Family Institute (DIFI), and the World Innovation Summit for Education (WISE) – all three are Qatar Foundation policy centers – collaborated on a study to understand the status of and challenges related to technology overuse amongst adolescents in Qatar, identify its impact on their health, education and family cohesion, and provide recommendations to policymakers in Qatar. The team worked with Hamad Bin Khalifa University (HBKU) for guidance and advice for this study.

Results from the first phase of the study were published in a preliminary report in 2021, which was featured at the 10th WISE Summit. This report summarized the views of a group of parents and practitioners in Qatar based on qualitative and quantitative data collected and analyzed by the research team.

In 2022, the research team collected both quantitative and qualitative data from a group of adolescents to understand how technology overuse is affecting them. This report also includes a full analysis of the data collected from parents and practitioners in phase one. The report paints a picture of: the patterns of technology use (and overuse) among adolescents; how they and their parents view its impact on adolescents' health, education and family cohesion; how practitioners view the magnitude of this problem in Qatar; and how all participants think it should be addressed.

We hope that the findings from this report will be useful to children, teachers, medical practitioners, and education, health and family policymakers in Qatar and beyond. This study reveals the impact of technology overuse on the lives of adolescents and will provide a basis for other researchers to build on in the future.



Ms. N Sultana Afdhal
Chief Executive Officer
World Innovation Summit
for Health (WISH)



Mr. Stavros Yiannouka
Chief Executive Officer,
World Innovation Summit
for Education (WISE)



Dr. Sharifa Al-Emadi
Executive Director,
Doha International
Family Institute (DIFI)

EXECUTIVE SUMMARY

Overuse of technology, informally called digital addiction, is a broad term used to describe excessive, obsessive, compulsive technology use. It has been shown that such use negatively impacts health, education and family relationships. However, the majority of research to date examines this issue in adults; the perspective of adolescents has not been a focus. In this study, we examine the impact of excessive use of digital technologies on family cohesion, relationships within families, children's health and learning, and what parents and policymakers can do to address this issue. We examine factors that influence children and parents' excessive use of technology, as well as parents' strategies and coping mechanisms for dealing with adolescents' excessive technology use. With the scarcity of validated and specialized approaches to combat the issue, whether in prevention, harm minimization or treatment, we also review the services provided to families, their content, challenges they face, public perception of these services and evidence of success.

This project was implemented in two phases using both qualitative and quantitative methods. A cross-sectional quantitative survey of parents with children aged ten to 16, as well as structured qualitative interviews with parents (n=39) and practitioners (n=13), were conducted in Phase One. In Phase Two, a cross-sectional quantitative survey was conducted on a non-random sample of Qatari children aged ten -16 (n=587), as well as face-to-face qualitative interviews with 42 children.

Both phases showed that technology overuse is widespread and that most families needed help in dealing with it. The majority of parents expressed concerns over the effects of excessive technology use on their children's health, education, and family relationships. In terms of health, both parents and adolescents mentioned headaches, physical pain, stress, anxiety and obsession as symptoms. Poor academic performance and a lack of concentration, along with changes in family relationships, were also identified by parents and adolescents. The COVID-19 pandemic has also blurred the lines of what we consider excessive and problematic technology use, as it blended study time with family time especially during remote learning.

When comparing the results of parent and children's interviews, it appears that there is a discrepancy between their views. While parents emphasize the behavior of their children and the need for them to comply with what parents believe is good technology use, children blame their parents for being too busy and not offering an alternative. Parents use basic or simple strategies, such as controlling devices or taking them away, and using alternative activities to distract them. Similarly, adolescents said their parents use power to restrict their use of technology when they use it excessively.

The findings also indicated that discussions between parents and children remain rather vague. Parents discuss generic consequences of technology use, neglecting that technology overuse itself might be a consequence of other underlying issues. Adolescents prefer a dialogue format rather than a monologue when communicating with their parents. The results further showed that some parents have problematic internet usage, and this positively correlates with their children's behavior. This underlines the importance of parents setting a good example for their children when it comes to technology use.

Additionally, practitioners interviewed indicated that there are no specialized treatment centers for digital addiction. The currently available approaches are for general behavioral issues. Advice on how to deal with technology use is presented in a way that is adapted from other types of problematic behaviors, such as procrastination and excess of play, whether online or not.

Awareness raising about the phenomena in Qatar is limited; parents lack awareness about digital addiction and associated risks. Overall, the results indicate a need to address the issue in a more integrated manner, where education, health, and communication sectors can support families in maintaining a balance between their use of technology and other activities that foster bonding and cohesion. In order to overcome this problem, ministries and schools must work together with families to raise awareness and provide support. This report puts forth policy recommendations which take into account the country's cultural and social dynamics, along with children's needs.

CHAPTER 1: INTRODUCTION

1.1 Background

In recent years, concerns have grown around the psychological and physical harm, especially among adolescents, from excessive and compulsive use of digital and internet-enabled devices used for accessing social media and online video games. Digital addiction – also known as internet addiction, internet use disorder, problematic internet use (PIU), technological behavioral addiction (TBA), among others – is a broad term used to describe excessive, obsessive, compulsive technology use. Addictive technologies include gaming, online shopping, social media use, video streaming, and messaging. Digital addiction occurs when the relationship with technology harms the user's life and is difficult to stop despite its harmful effects.

Even though technology addiction is not included in the latest version of the Diagnostic and Statistical Manual of Mental Disorders (DSM), it is argued that technology use can exhibit symptoms similar to those seen in compulsive gambling, another behavioral addiction included in the manual. Like other impulse control disorders, tech addicts can experience periods when symptoms subside and periods when they become more severe. Symptoms of tech addiction include: 1) excessive use, often associated with a loss of sense of time or a neglect of basic drives; 2) withdrawal, including feelings of anger, tension, and/or depression when the device is inaccessible; 3) tolerance, including the need for better computer equipment, more software, or more hours of use; 4) mood modification, including the over-reliance on technology to escape problems and achieve gratification; and 5) negative repercussions, including arguments, lying, poor achievement, social isolation, and fatigue. [1,2]

In different parts of the world, digital addiction prevalence varies, ranging from 2.6 percent in northern and western Europe to 10.9 percent in the Middle East.[3] In spite of the absence of diagnostic criteria for digital addiction, internet gaming disorder (IGD), a type of behavior related to digital addiction, has been included in the Diagnostic and Statistical Manual for Mental Disorders (DSM-5), as an area for future research.[4,2] The World Health Organization (2018) now lists gaming disorder as a diagnosis, which it categorizes as predominately online or predominately offline.[5] It is also unclear what terminology should be used to identify this phenomenon.

Addiction to digital media in adolescents has largely been studied from the perspective of adults. We believed it likely that adolescents held unique perspectives and ideas on the full range of issues around technology use, often in contrast to those of parents, health professionals, and educators. The literature has not described and examined the nature and quality of conflict communication among adolescents and their parents. Parents, moreover, may not be role models

for their children; problematic use of technology and digital addiction may be infectious and transferrable in both directions. Therefore, our study is one of the first to study digital addiction from both parents and adolescents' perfective in Qatar.

1.2 Our approach

The main research question of the study is: What impact does excessive use of digital technologies have on family cohesion and relationships within the family, health of children and adults, and student learning, and what should parents and policymakers do to address this issue in Qatar?

The objectives of the project are:

1. Understand the impact of excessive use of digital technologies on family relationships, and children's health (mental, psychological, and physical) and education outcomes.

2. Understand the perceptions and experiences of Qatari families, adolescent and practitioners regarding excessive use of digital technologies, in order to define and identify the problem.

3. Identify the factors that contribute to excessive use of digital technologies among children and parents.

4. Identify coping mechanisms to deal with issues that lead to excessive use of digital technologies.

5. Propose recommendations based on the key findings and best practices that may contribute to relevant policy and program development and policy advocacy.

To address these objectives, three studies were conducted. The first study, consisting of two parts, captures and analyzes the parents' perspectives on the issue with their adolescent children. The first part is qualitative, based on interviews; the second is quantitative and based on a survey. In the second study, we interview and survey adolescents to gather their perspectives. The two studies allow us to compare and contrast the two perspectives. The third study analyzes the status of care services targeting technology overuse in Qatar. We interviewed practitioners in various sectors in Qatar about the available services and the public attitude towards them.

CHAPTER 2: LITERATURE REVIEW

Across the globe, technology is used for learning, entertainment, business, and communications. Our technology-driven world continues to fundamentally impact all aspects of life.[6] We use digital technology according to our individual needs, tools, and connectivity. It is evident that adolescents are primarily using various technical instruments. Today, children of all ages are growing up in a connected world where digital technology, with its many attendant devices, social media and gaming platforms, and seemingly endless applications are a part of everyday life. These devices are often used in unforeseen ways, some creative and others problematic.[7] In this section, we examine the impact of moderate and excessive use of technology on the education, health, and family relationships of adolescents.

2.1 Technology and education

Considerations for technology use in education Technology has enabled personalized learning, improved student digital skills, and saved teachers' time. Numerous studies have shown that personalized blended learning improves student outcomes.[8] Today, computers, tablets, e-mail and the internet are integral tools in the classroom and have changed teaching and learning significantly. With the move towards technology-enhanced learning, students, who are tech-savvy already, are more enthusiastic about subjects when technology is used in teaching.[9] Increasingly, teachers are using technology to improve student engagement, motivation, and learning outcomes. Schools worldwide shifted to remote learning in the wake of COVID-19 on very short notice, and technology has become increasingly important for continued learning.[10] Teleconferencing platforms, TV programs, virtual learning environments, and text messaging apps are among the technologies used for remote learning. Teachers, parents, and policymakers need to consider a new set of issues as a result of how digital technologies alter adolescent interaction, socialization, and learning. For these stakeholders, the question is: How does excessive use of these technologies affect their academic performance?[11]

Impact of technology use on daytime function

Youth often use digital devices at most hours of the day and night, leading to sleep deprivation. Sleeping late and getting up early for school, college, or work compounds the problem.[12] Exhaustion reduces focus, motivation, and academic performance in school or college. It is important to determine the extent to which use of smart mobile devices is linked to insomnia, and how this affects student academic performance, according to Owusu-Marfo[13]

Impact of using technology in the classroom

There is no doubt that technology enhances learning. However, even when technology is used in teaching and learning, there are concerns about overuse. Using technology could negatively impact education by impairing reading and writing skills, dehumanizing learning environments, altering social connections between teachers and students, and isolating those who use it.[14]

Research has shown that technology can foster innovative practices and meaningful learning in the classroom.[15] According to D'Angelo, we must remember that any technology used in the classroom needs to be appropriate for both teachers and students.[16] It is generally accepted that educators and instructors support the use of technology in the classroom,[17] as long as they are trained in professional digital competencies. According to studies, the use of technology in education has been shown to enable students to participate actively in their learning.[18] A variety of reasons make technology attractive to students, including its adaptability, usability, and engagement. One drawback of teachers' adopting technology is their need for more training. Teachers should help students set up their gadgets because not all students know where to go and what to do with them, which can take time away from class and extend the teaching period.[19]

Impact of technology on student engagement

Research shows that using technology effectively increases student engagement and learning. D'Angelo finds that technology influences student attitudes toward learning emotionally, behaviorally, and cognitively.[15] Technology improves student-teacher interactions. Students can easily become distracted by their devices and conduct arbitrary searches while working, which increases their level of inattentiveness and preoccupation, according to some teachers .[19] A 2013 study found that students are more likely to engage when technology is used. Students will achieve more if their attitudes and motivation improve in the classroom. [20]

Effect of technology use on children's and adults' education and success

Education and learning processes in schools and universities have changed dramatically as a result of the emergence of new technology. [21] In one study, 4,697 participants were divided into two groups: academic users and entertainment users. Those who interact with classmates and teachers or use online resources in a balanced way are more likely to succeed academically.[21] Students who log onto the internet more than three times a day are considered excessive users. They also use « internet» in a generic sense, which can include social networking sites like Facebook and Twitter as well as software programs.[22] Children who use the internet more frequently for educational and learning purposes perform better academically than light or moderate users. In general, both studies

showed a link between high internet usage and academic success. The use of multiple technological tools allows students to engage in higher-order thinking, improve communication, and engage in collaborative problem-solving activities and debates.

Parents' perceptions of the effect of technology on children's education

The impact of digital technology use by children on health, education, and family relationships is debated. Parenting or nurturing children is very much influenced by DT, and parents play an important role. According to a national study conducted by Northwestern University, [23] technology and children's education are related. Most parents who responded to the survey indicated that these technologies had a positive impact on their children's academic skills. The majority of parents (60 percent) said computers helped their children learn reading and math skills. most parents agreed that mobile devices like smartphones and tablets helped young people learn and develop their academic skills. Most parents viewed new digital technology positively. In a second survey on juvenile technology use in Qatar, the Ministry of Transport and Communication found that parents had divergent opinions on the impact of technology. This study suggested that there are some discrepancies in parents' perceptions of how modern technology affects educational outcomes.

2.2 Technology and family life

Parenting and digital technology

Internet use by children and teenagers is increasing, raising parental concerns. Parents need to be educated about technology, and parental control techniques are needed. [24] Studies show that technology has changed the way parents and their children interact.[25, 26, 27] Whether to encourage children to use digital media for learning[28] or reduce the risks of adverse effects is a parent's decision.

Family factors relating to internet or digital addiction have been studied worldwide.[24,29-34] These studies highlight how parenting practices affect use of digital media and the internet by youth. A parent's role in the family is crucial to keeping youth from engaging in undesirable behavior. The way parents handle internet use depends on their parenting standards and styles. Researchers have identified four types, or styles, of parenting:

1. authoritative parenting, in which parents are both more responsive and demanding than the average parent;

2. authoritarian parenting, which is controlled, but lacks warmth; children may become aggressive when a parent adopts this style;

3. permissive parenting, in which children are allowed to act in accordance with their own desires, without being controlled; this method may cause the child to develop selfishness; and

4. the democratic or laissez-faire parenting strategy, combining an authoritarian and lenient approach to parenting.

The literature identifies this fourth strategy as the best because it instructs the child through discussion and explanation of what to do.[29,32] In using this method, parents foster mutual understanding with their children, while limiting their freedom. Research has shown that "teenagers with positive parenting have a lower prevalence of digital addiction than those with permissive parenting and authoritarian methods".[29] Studies have also shown that good relationships between parents and children will result in reduced internet use, including extreme or addictive use.[35-38] Research indicates that as parent-child conflict increases, there is a likelihood that internet addiction will rise.[35, 38]

Parents' and children's gaming addictions have also been linked in the literature.[39] There is evidence that a parent's own excessive gaming negatively affects family relationships. While it may provide temporary stress relief for the parent, it can lead to the neglect of their children, sadness, and loneliness, as well as disapproval of parents, and resistance to their parenting methods.[39-43] Evidence-based conclusions support the link between parenting style, and digital addiction. Research suggests that parenting style impacts a child's digital game addiction, but the impacts of specific parenting styles and strategies are not thoroughly discussed. It is important to emphasize the crucial role that parenting methods and family relationships play in reducing the risk of digital addiction.

Digital technology and family relationships

Family relationships have been harmed by excessive internet use. Using digital media carries a variety of dangers, and children and teenagers are the most vulnerable. There are three types of online dangers, according to Hasebrink, Livingstone, and Haddon: content, contact, and conduct. Content risks include exposing children to inappropriate information. The conduct risks are the active players who contribute risky content, while the contact risks are peer-to-peer communications.[44] Kaya et al. report that children who aren't online experience frustration, which has the unintended consequence of causing them to forget their family and friends in favor of looking for new acquaintances online.[39]

Studies have demonstrated that technology reduces family engagement, decreasing time spent with family members.[45,46] Internet use has been observed to reduce intergenerational interaction among families.[47] Furthermore, too much reliance on the internet can lead to isolation from friends and other social connections. Despite the lack of face-to-face engagement resulting from time

spent online, the internet gives adolescents knowledge that is appealing. Time spent online is not specifically proven to be more helpful than face-to-face contacts. [48]

According to a Turkish study on internet use among parents and their children, parents felt that the internet hampered face-to-face communication. Parents claim their youth spend too much time on computers, causing family communication problems. [49]

Several empirical studies have revealed a link between the quality of parental bonding and adolescent internet use. Huang and colleagues found that "parent-child relationships affect adolescents' self-concept and, ultimately, their behavior".[34] Positive parent-adolescent interactions lead to a healthy and secure relationship, whereas negative parent-adolescent interactions lead to an insecure parent-adolescent relationship, resulting in problematic behaviors like digital addiction. [34] Similarly, in further studies, adolescent internet use and addiction were found to decrease with a positive parent-child relationship [35,36,37] and that parent-child conflict increases addiction risk. [35, 38]

Parental mediation and strategies

Parental mediation refers to how parents manage and control their children's media experiences.[34] The nature of such mediation depends on the nation and the disparities among parents and households. Livingstone categorizes parental mediation as follows: [27]

1. Active mediation of internet use: practices such as talking about internet content and online activities, sitting nearby while the child is online and actively sharing the child's online experiences.

2. Active mediation of internet safety: activities and recommendations aimed at promoting safer and responsible uses of the internet.

3. Restrictive mediation: setting rules that limit time spent online, location of use, as well as content and activities.

4. Technical restrictions: the use of software and technical tools to filter, restrict and monitor children's online activities.

5. Monitoring: checking up on children's online practices after use. [27]

Parental mediation does not benefit all age groups, and most parents choose talk over other mediation techniques.[50] Typically, parents in Europe actively supervise their children's internet use from age nine to 16. [51-53] The use of restrictive behavior is common, including for young children under eight or among less educated parents.[54]

Studies show that parents who are warm and supportive, and those who are demanding can use parental mediation techniques.[50] Parenting style and the family's socioeconomic environment were identified as crucial factors in the mediation process. As Valcke noted, authoritative parents combine their methods by using active mediation, social constraints, and technical limitations.[55] Parental status and education also affect how they employ techniques. Parents with less education apply technical restrictions more often, and exert less active control over children's internet usage.[56]

Parenting techniques can also lead to conflict between parents and children.[30] Evidence suggests that the limited mediation approach increased parent-child conflict. The internet usage limits set by parents may lead to children acting out[57] and reacting negatively toward their parents. Such limiting may actually result in increased interest in using the internet among youth.[30]

In Arab nations, few studies have examined parental mediation techniques. Alqahtani and colleagues (2017) found that parents in Saudi Arabia are interested in understanding what their children are doing online, and reducing their risk on the internet, but lack strategies to do so. Lack of resources, inadequate knowledge about the internet and lifestyle weakened cooperation among parents and their children.[58] The current study is crucial because it adds empirical data to the body of knowledge about parenting techniques in Qatar, and how they impact parental interactions with their children.

2.3 Technology and health

Childhood and youth is a vitally important time for physical, cognitive, emotional, and social development, and strongly influences how well an adult will feel and function later in life.[59] Without the right support, early challenging experiences can impede healthy development and negatively impact a child's mental and physical health.[60] Concerns have been raised about the impact of the excessive use of digital technology on children's wellbeing, despite that platforms can provide access to a range of information, new ways of learning, a wider social network, seeking help, and entertainment.[61] There is varied debate over the impact and deeper implications of excessive digital technology for children, and how it can be addressed.

The question of how children's use of digital technology is harming their mental and physical health is frequently at the forefront of conversations and policies linked to children's digital engagement. Concerns over excessive screen time and increasing dependency on digital technology during the COVID-19 pandemic have intensified. Digital technology and interactivity pose a significant risk to children's physical and mental development, amplifying the dangers and harms they already

face offline, and putting vulnerable children at greater risk.[62] Digital technology may negatively impact children's health, resulting in obesity and mental health issues like addiction and depression.[63-64]

Digital addiction and mental health

Over recent years, researchers have found a correlation between excessive use of technology and mental illness. Research indicates that children and adolescents who are addicted to, and overuse digital technology are afflicted with a variety of mental disorders and conditions. These include self-esteem, locus of control[65], and self-regulations issues [66,67], as well as attention deficit hyperactivity disorder (ADHD)[68-,69], depression[70 -71], anxiety[72], and damaged psychological well-being.[73,69] Mental health is negatively affected by sleep loss and by withdrawal from high levels of digital use.[74-76] A survey of 2,114 students with internet addiction (IA) using a self-report questionnaire, showed that the students had higher symptoms of ADHD, depression, social phobia, and hostility.[38] Evidence from the MENA region indicates that children who use technology frequently are more likely to suffer mental health issues. Research conducted in Jordan found a positive relationship between anxiety and depression, and internet addiction.[77,78] Furthermore, research in the Kingdom of Saudi Arabia (KSA) found that 38.4 percent and 2.1 percent of participants were classified as moderate to severe internet users, respectively, whereas 64.6 percent were depressed and 35.4 percent had symptoms of depression, respectively.[79-80]

In Egypt, many studies have demonstrated a correlation between (IA) scores, social phobia, and generalized anxiety disorder. [81-83] A study in the United Arab Emirates revealed that children who use digital technology excessively might face social, emotional and behavioral problems such as isolation, anxiety and depression.[84] Studies found no association between online use and depression among children with medium or high-quality friendships. However, such an association was identified among those with low-quality friendships. Children with low-quality friendships are less likely to report depression when they interact with others online. there are vast online resources and networks that support positive mental well-being.[85] A study of excessive use of digital technologies among Qatari adolescents found that mental health apps were the most popular type of health-related app used by teens.[86] It seems these apps are quite effective, as 75 percent of users attempted to change their behavior after utilizing them.[86]

Digital addiction and physical health

The American Academy of Pediatrics has recognized the prolonged use of digital technology as contributing to childhood health problems in the twenty-first century.[87] In numerous studies, excessive use of technology has been demonstrated to negatively affect children's physical health, resulting in somatic problems, insufficient sleep, excessive weight in adolescents, head and neck flexion and lumbar lordosis.[81, 88-90] Digital technology use has been linked to several health issues, including carpal tunnel syndrome, dry eyes, headaches, musculoskeletal difficulties, discomfort, and visual fatigue.[91]

Gur, Sisman, Sener et al. report that Turkish teenagers who spend long periods of time online experience such pain, as well as constipation, gas, watery eyes, and eyes redness.[92] Similarly, Saueressig et al. found that computer use for more than three hours a day is associated with musculoskeletal pain in both boys and girls.[93] Television and computer use often lead to unhealthy lifestyle patterns in children. Those who watch TV or use computers are less likely to engage in physical activity, more likely to eat unhealthy foods, and risk damaging their vision.[94] Children's poor living behaviors can also impact obesity rates.[95] Reducing online time does not automatically increase physical activity, however. As one study of 11 to 13-year-olds indicates, internet use does not necessarily displace exercise; other factors such as lack of motivation or interest may be involved. The research suggests promoting physical activity and a healthy diet independently may be more effective.[96]

Although research is limited in the MENA region to children's general health, data has documented the negative health effects of technology overuse. According to a study comparing Saudi Arabian and Egyptian adolescents, 87 percent of Saudi adolescents use the internet daily, while only 69.6 percent of Egyptian adolescents do so. In the KSA, internet addiction rates among adolescents varied from severe (0.9 percent), to moderate (45.3 percent), and mild (47.7 percent). For the Egypt adolescents, the figures were: severe (0.3 percent), moderate (46.3 percent), and mild (44.2 percent). internet use caused musculoskeletal pain in 67.3 percent of KSA adolescents, and in 74.3 percent of ARE adolescents.[82]

Evidence from Qatar shows that a higher proportion of Qatari students use the internet problematically. Sleep time was significantly less for students with problematic internet usage (PIU), which is defined as an inability of one's use of internet which leads to negative impact in life,[97] than for those without. Further, the proportion of students engaging in moderate physical activity was significantly lower in the PIU group. Qatari nationality, male, having a non-working mother (housewife), eating fast meals, and having a high score on the Beck Depression Inventory (BDI) were positively associated with PIU, but moderate and light physical activity were negatively associated.[94] Moreover, Bener et al. document that low vision is strongly associated with unhealthy lifestyle habits like prolonged internet use, reclining, and obesity.[95]

CHAPTER 3: METHODS

3.1 Research design and methods

In phase one, a cross-sectional quantitative survey was conducted on a non-random sample of parents in Qatar who have children aged ten to 16 (N=216), using online SurveyMonkey platforms and snowball sampling techniques. Participants were asked to fill out a mostly closed-ended questionnaire, and the average time for responding was five to 15 minutes. Questionnaires were administered online. For adequacy testing, a pilot study was conducted first. Respondents' ability to understand and answer the questions was assessed and refined accordingly. The questionnaire was finalized after evaluating pilot study data. The survey was developed initially in English and subsequently translated into Arabic. Bilingual researchers have checked the quality of translation. The survey had the following main sections:

- Demographics, including age, gender, income, profession and country
- Parents responses to the internet Addiction Test – eight items by Young[98] (See Appendix 2)
- Parents responses about their adolescent children's technology usage, education performance, arguments about technology usage, need for help regarding that and awareness of available services
- Parents assessment of their children's internet addiction, measure through Wartberg et al [99]

Furthermore, face-to-face semi-structured qualitative interviews with parents with children ages ten-16 were conducted to gain a deeper understanding of parents' perceptions and experiences of excessive usage of digital technologies. Defining and identifying the problem include:

- identifying the factors contributing to excessive use of digital technologies among children and parents
- understanding the impact of excessive use of digital technologies on family relationships
- understanding its impact on children's mental, psychological, and physical health
- understanding its impact on education outcomes or academic performance

The parents interviewed were a mix of male and female, of which the majority are Qatari and Arab (Jordanian, Sudanese, Palestinian, Egyptian, Syrian, Yemeni, others) expatriate populations in Qatar. Most parents ranged in age from 29-54 years old. Most parents had one to six children at home, living in villas within gated communities (compounds) or detached houses. All parents were educated (bachelor's degree and higher), working full time and have good living conditions.

Health, social and education professionals were also interviewed to assess current health and education approaches, and their status in Qatar.

The second phase of the study included a cross-sectional quantitative survey conducted on a non-random sample of children aged ten to 16 living in Qatar (N=587), using the SurveyMonkey platform and snowballing sampling techniques. The questionnaire was structured with mainly closed-ended; and the average time for study participation by each respondent was ten - 20 minutes. The translation and adequacy assurance procedures mentioned above were followed in this phase as well. The survey covers the following topics:

- Demographics, including age, gender, family income, nationality and parents' level of education and employment status.

- Children's responses to the internet Addiction Test – eight items by Young[98] (See Appendix 2)

- Parental monitoring, their feeling about the amount their children use digital technology for non-essential reasons, education performance, views about class teachers and students, etc.

- Children's responses about their technology usage, time spent, and their usage of technology as compared to their classmates,

Face-to-face, in-depth qualitative interviews with 42 children aged ten to 16 were conducted to gain a better understanding of children's perceptions and experiences with excessive use of digital technologies in Qatar; define and identify this problem's aspects; identify the reasons that lead to children's excessive use of digital devices; and understand the impact of such usage on family relationships, children's health (mental, and physical), and educational outcomes or academic achievement.

The children interviewed were a mix of male and female, of which the majority are Qatari and Arab (Jordanian, Sudanese, Palestinian, Egyptian, Syrian, Yemeni, others) expatriate populations in Qatar. Most were in middle school and ranged in age from 11-17 years old. Most children had one to five siblings at home and lived with their parents in villas within gated communities (compounds) or detached houses. Most children's' parents were educated (bachelor's degree and higher) and working full time.

3.2 Sample and settings

In this study, the target population was Arab parents with children aged ten to 16, and practitioners from the health, social and education sectors in Qatar. With regard to the qualitative interviews, a non-probabilistic purposive sampling approach was used to select parents with children ages ten to 16 (n=44), children ages ten to 16 (n=42) and practitioners from the health, social, and education sectors (n=13). Parents were recruited through social media, messages, emails, and flyers. Children were recruited from public and private schools in Qatar, and practitioners were recruited through their organizations.

For the survey, anonymous, random samples of parents with children aged ten to 16 (N=216), as well as children aged ten to 16 (n=587) from the public and private schools in Qatar, were recruited using the online SurveyMonkey platform and the principles of the snowballing sampling technique. The following inclusion criteria were used in the parental study: 1) living in Qatar; 2) having children aged ten to 16 years; 3) of Arab ethnicity, 4), and having adolescents who heavily use technology. For the children study, the following inclusion criteria were used: 1) adolescents aged ten to 16; 2) living in Qatar; 3) of Arab ethnicity, 4) having a parent providing consent.

3.3 Data management and analysis

Quantitative data was coded and analyzed using JASP software. A combination of univariate and bivariate analysis was used. In descriptive statistics, univariate data is used to summarize the study's sample and measures, such as central tendency, using simple summaries. Analyzing two variables to determine their empirical relationship, e.g., correlation, is a form of bivariate statistics. In the qualitative data, interviews were conducted partially face-to-face or over the phone, due to COVID-19 restrictions, at a convenient time and place for participants. Interviews were conducted by the research team representing the three institutes (WISH, WISE and DIFI), who transcribed the data. Interview data were then coded and analyzed using Strauss and Corbin's[100] grounded theory approach. During the

coding phase, broad categories were created for definitions of digital addiction, behavior, conditions, reasons, pros and cons, strategies, arguments, the institute's experience in managing excessive digital technology use, challenges, and current approaches offered by health, social, and education sectors. Subcategories were then formed, as conceptually similar content was grouped via constant comparison. For example, the "reasons for use of technology" category had subcategories like "entertainment" and "education".

Interested in the qualitative and contextual complexity of the issue, we focused on participant views[101] of excessive use of technology by adolescents. Utilizing qualitative, semi-structured interviews with open-ended questions, we successfully elicited data that allowed the researchers to identify themes related to the reason for use, arguments, strategies, and help seeking of parents' views and perspective of their adolescents' use of technology.

3.4 Ethical considerations

This research was approved by Hamad Bin Khalifa University's IRB. Data collection was voluntary, and respondents were informed of the study's purpose at the time of data collection. Informed consent was given to parents and practitioners. Participants were free to refuse participation, decline to respond to any questions and/or withdraw from the interview at any time. Children's legal guardians provided written informed consent for the interviews and the online survey. Results will be aggregated and anonymously presented; all information obtained will remain confidential.

CHAPTER 4: FINDINGS

This chapter presents findings from the qualitative and quantitative analysis of the three groups: parents, children, and practitioners.

4.1 Parents' perspectives: Qualitative findings

The following are the main themes and subthemes that emerged from the analysis.

4.1.1 Knowledge and source of information about DA

The majority of parents had heard about DA online or through social media, from friends, reading articles or research, family members, etc. Six participants had never heard of DA.

4.1.2 Children's relationship with technology as perceived by parents

Almost all parents indicated that overuse of technology had negative impacts on their children and that their children's relationship with technology was unhealthy. Parents mentioned health issues either physical or psychological (vision, physical activities, back problems, bad eating and drinking habits, anxiety, and stress), social issues (bad behavior and mood modification, lack of concentration and self-control, distraction, aggression, children becoming unsociable, social withdrawal and lack of interaction).

Comments typical of parents included the following. Technology overuse was *"a big problem in my opinion.... everyone knows... but no one knows what to do about it... it is certainly not healthy... it affects the eyes and the health in a negative way. "*

"I think it has negative health effects such as sight problems, extra electric shocks in the brain, and can lead to suicide."

Seven participants mentioned the importance of technology in getting information, socializing with friends, and entertainment. *"Technology has become necessary for many things, especially now for online schooling, research, and project work in addition to online shopping, social media and other purposes."*

4.1.3 Patterns, purposes, and duration of technology use among children and parents

The purpose, duration, and patterns of technology use by fathers and mothers differ. All fathers used digital technology for personally and professionally, often for about eight to ten hours each day, mostly during office hours. During the evening, they used these technologies for social and personal purposes. Digital technologies are used by some fathers to watch content (videos, TV shows, etc.). Laptop computers and cell phones are most common, some use only cell phones. Mothers used digital media more for communication and socializing. A few mothers reported using technology for work and for online shopping and ordering food and groceries. Many mothers use digital technologies in the evenings, and some during the day. Digital technology is used throughout the day by a small number of mothers. About half of the mothers interviewed use technology for three to five hours a day. About half use technology between eight and ten hours a day; the other half do not specify.

Almost all children use technology for more than one purpose, including schoolwork as remote learning becomes more popular. Many participants use it for games and social media, and some watch content online. Very few parents indicated that their children use technology to order food and for online shopping. All children use technology in the morning for schoolwork and homework in the afternoon and/or evening. Many of them use technology throughout the week and on weekends as well. Most children use technology for around six to eight hours, with some exceeding that, to 12 hours a day. Most children use more than one device, such as laptop computers, tablets, and cell phones. A small number of parents reported that their children use Play Station for games.

4.1.4. Factors characterizing DA, from parents' perspectives

When parents were asked what characterizes DA, most of them emphasized the amount of time as a key factor. A number of parents reported that their children used technology for around four to eight hours per day, and sometimes up to 12 hours a day. According to one participant: *"In my opinion, it is a disaster and abnormal. ... When my daughter sits at home, there is nothing in front of her other than her mobile... she holds the mobile for hours."*

The usage context was cited as a contributing factor by a few participants. Some parents reported that children at this age use technology excessively during the week and on weekends, even when they are sleeping, eating, driving, etc.

"They are addicted when I see them using their devices every day, and when I come home, they are on their computers when I speak with the; they are sitting in front of the computers most of the time, 24/7."

Generally, children who use technology excessively exhibit addiction symptoms. These include social withdrawal and replacement of the real world, tolerance, obsession, and preoccupation, as well as loss of self-control and behavioral changes. In relation to social withdrawal and replacement of the real world, one parent pointed out:

"To me, addiction is when they are absent from family gatherings, family obligations, when they don't sit with family, when they don't play with their peers or brothers, when they stop doing other activities, ...because of prolonged phone or ipad use."

Obsession, preoccupation, and tolerance are characteristics of excessive technology usage. The desire to interact with digital technology persists even when it is risky. When cut off, they become preoccupied with missing opportunities to engage with their online social networks. As adolescents use technology to access the internet, social media, and other entertainment venues, they tend to be virtually inseparable from their mobile phones. One participant said:

"When he wakes up in the morning, he keeps holding the phone for one or two hours. The second he opens his eyes, he starts using the phone and laptop; it's a disaster."

DA is also characterized by **loss of control and changes in behavior.** Several parents made reference to spending longer on technology than intended, and that they cannot go a few days without using their phones. In addition, some participants stated that they had trouble limiting their technology use. One parent specified:

"If we take away the game that he uses, he will start jumping. He can't sit on the chair, this is not his real personality. He is just jumping all the time, fighting with anyone in front of him, [and] he breaks things."

Few participants further highlighted **mood modification** as a sign of DA.

"If you see that his or her mood changes when communicating with them or trying to stop them, then their addiction will come to light."

Health problems are other related factors to DA. Several parents clearly mentioned that the excessive use of technology can lead to health problems such as pain in the lack of sleep, back pain, sight problems, lack of concentration, etc. As stated by one parent:

"I see him lately complaining about his back and having sleep problems because he is using it too much especially the game which has disturbed him a lot."

4.1.5. Reasons for DA from parents' perspectives:

A number of internal, external, and COVID-19-related factors have been identified as contributors to DA:

External factors

External factors included the **influence of peers (friends)** who accessed the internet, which placed pressure on participants to use mobile phone and internet to fit in with their peers. Peer pressure was reported by few parents to be one of the reasons triggering internet use. As one parent mentioned:

"Kids nowadays communicate through online gaming. As a group of friends, they play and fight and form a gang. This interactive dimension became a part of peer pressure or peer support."

The family environment was cited as an external factor by some parents. In the family, all members are busy with different activities, so they do not have time to spend with their children. Some parents reported that they are busy with their work/other activities and do not spend time with them, so they used technology as a babysitter. As one parent mentioned:

"Sometimes when parents are too ... busy and don't have time to sit with their kids, they would give their child the device to keep them busy while they are doing their chores."

Excessive use of technology is also caused by **parents' lack of responsibility and awareness.** Some parents unconsciously contributed to their children's addiction to technology by not controlling and supervising their usage. Children will become more attached to technology as it becomes a tool for socialization. One parent said:

"Probably because of lack of parental supervision, which can lead to big problems, and this applies to everything, not just tech. Parents should have restrictions on what they can provide."

Another factor is **the design of technology and the ease of access to it.** Children are passionate about using technology because it encourages them to do so. It is no surprise that many features of technology design are based on the fear of missing out. As one parent said

"It is easy to access, it doesn't require effort, they just log in and communicate with anyone... It also attracts children to play games and download software to their devices, which they find to be quite engaging and entertaining."

Lack of alternative activities is another related factor that contributes to DA. Very few parents have mentioned that there are no other options/activities for their children to do in their spare time. For instance, one parent mentioned:

"They don't have anything else to do to spend their free time, if they had something else useful to do or could improve their skills and energy, they would stop using these devices, but I don't see any other alternatives."

Internal factors

Boredom, communication with friends, watching online content, and playing games for entertainment are some of the internal factors. Parents reported that **boredom** triggered their children's desire for technology, and internet use was one of their coping mechanisms. According to one participant:

"Since they have nothing else to do or invest their time in, they are getting bored, and when I realized this, I organized their time on a daily or weekly basis to keep them away from technology."

Consequently, some people find that browsing and checking online content and updates can help relieve boredom. The use of technology was also associated with **entertainment** for children, especially since new technologies are designed to encourage children to continue using them. Internet activities such as chatting, shopping online, and gaming contributed to technology use and dependency. Parents reported that their children used technology for entertainment purposes, including socializing with friends, watching online content, and playing games. One participant stated,

"I think it's mainly for entertainment, they don't know what else to do with their spare time."

Communicating and socializing with others is another reason for the overuse of technology. One participant clearly stated:

"Kids love to socialize with their peers and communicate with them; they share a lot of things and need to feel they belong to the group."

Studying and learning new things are factors contributing to the overuse of technology. Few participants pointed out that they used technology to study and learn new things. As stated by one parent

"It is the passion that drives them. I see my son when he uses technology, he watches videos to see how people play games. They love to know and learn about new things."

COVID-19 factors

COVID-19 was accompanied by regulations, restrictions, and instructions to stay at home. During these periods, children used technology excessively for communication since they couldn't interact with friends and relatives physically or do their schoolwork. It has been reported by some parents that their children's use of technology has increased dramatically (too much screen time) during the pandemic, and that such an increase in time has been difficult to manage because they were quarantined for extended periods of time, including school time.

As expressed by one participant: *"During the pandemic lockdown, children were unable to go out to play or see their family. They didn't have any means of entertainment except for tech. New online games are tempting and attractive such as Fortnite."*

4.1.6. Negative effects of DA

A wide range of negative effects are associated with DA, including mental and physical health impact, education, and family relationships. Many parents reported **adverse health effects** associated with excessive technology use, including headaches, pain in the eyes, back, hands, neck, and joints, in addition to changes in posture, nervous tension in the neck, insomnia, insufficient sleep, weakness, weight gain, and mental issues. These health problems were caused by disruptions in nutrition, lack of rest, and using technology excessively. For instance, one participant said:

"In terms of health, as we have learned in life and seen many cases, for example, they have an imbalance and an increase in their heartbeat, an increase in their nerves, neck pain or shoulder growth, and their eyes are blurred. These are all real health indicators of excessive technology use."

In terms of **education and learning,** most parents reported poor academic performance due to lack of concentration and not doing homework due to technology overuse. Few parents, however, reported positive effects of technology on children's education in terms of knowledge expansion, access to materials, and other aspects. One participant stated:

"In terms of education, some children appear to be getting low grades because they couldn't concentrate on class and study, and because they're thinking about what strategy they'll use when they go back home."

Overuse of technology is also associated with **social problems and disruptions in families.** As children use technology excessively, they are becoming more socially isolated and are not interested in family gatherings, which has a clear social impact on family relationships. The children are also showing signs of disintegration from the family, with increased conflict with family members. A number of parents reported social disorders and disruptions to their families due to DA. One participant stated:

"Kids do not want to socialize anymore, they just want to stay at home in their own world, even when it comes to daily routines, their minds are always thinking about technology, even when they eat, they are always in such a rush to finish so they can go grab their phones."

DA can also lead to other issues such as **violence, bullying, changes in behavior.** One noted:

"The most dangerous thing is that they can contact strangers, which could lead to dangerous interactions. It is possible that they will teach them values that are not in line with our traditions, and that is what scares me the most, because they may watch videos of foreigners teaching them weird things that may seem normal to them but may not to us as Muslims."

4.1.7. Who is responsible for causing and preventing DA?

The majority of parents blame themselves when asked who is responsible for their children's excessive use of technology. Parents are primarily responsible for their children's behavior. Their claim is that parents are busy most of the time, and they allow their children to use digital devices for entertainment. However, family can play a role in preventing and mitigating the effects of the problem. As stated by one parent:

"In my opinion, the question puts us as parents under the microscope... We as parents should be more aware, and we should put more restrictions on tech use. We cannot blame schools or other people; we are in charge in the first place."

In contrast, some parents blamed the schools for the children's attachment to technology. In their opinion, schools use technology in most aspects of education and do not teach children about its potential negative effects. However, the school can also play a role in reducing this problem by organizing lectures or awareness classes.

Some parents attributed the blame to the government and suggested that blocking some sites would assist in mitigating the problem by restricting children's access. They believe the government can help spread awareness about the issue in society. As one parent said:

"Governments are responsible for regulating the content and preventing certain programs regarding the quality of the materials that enter the country... Governments can set a policy, work on it, and make rules."

A few parents also blamed the production companies for the excessive use of technology as indicted by one parent:

"Production companies that appear on social media hold the biggest responsibility."

4.1.8. Parents' strategies for dealing with DA

It was important to discuss with parents how they deal with their children's use of technology. Among the strategies parents used to limit their children's use of technology were control, monitoring, education, rewards, punishments, physical activities, alternate activities, communication, discussion, parental power, and agreement.

Control is one method used by parents to limit their children's use of technology, which involves controlling time, content and screen controls. Most parents mentioned that they use control as a means of limiting technology use. This control can take the form of hiding the device or removing it. One of the parents stated:

"I take the device that is what I do, I take the mobile device from my older kids this way they would not know what to do they can watch TV or chat with their sibling ...." Control takes the form of ***time control*** *(i.e. specifying time for using technology),* ***content control*** *(i.e. monitoring the content children view), or* ***screen control*** *(i.e. using an application to lock the screen after a certain point of time)."*

Monitoring children was another means that parents use to minimize their children's exposure to the device. By monitoring, we mean parents keep track of how much time their children spend on the device and try to limit their use. It is interconnected with other parenting strategies.

Education is a method that parents used with their children. It is the parents' responsibility to educate their children that there is time for sleep, eat, play, and inform them about the negative impact of excessive use of technology such as back pain, neck pain, and eye problems. Many parents talk to their children about these topics, but in a general way, without providing proofs or documentation.

Reward and incentives is another strategy that parents used. By reward, parents meant that after their children have finished their work, they will be rewarded with a period of time to use the device. for example, if you get good grades, we'll buy you a PlayStation game. One parent said:

"I encourage my son by telling him that if he gets good grades, we'll let him play more or we'll buy him a game he wants. The most important thing is to keep our promises."

Penalties or punishments is a method parents used to discipline their children. This has a direct link to control since parents have a greater degree of power and control than children. Some parents use punishment by taking the device completely as a penalty for excessive use of technology.

Physical activities is an important aspect that most of the parents said that they used with their children. Physical activities can be sports such as swimming, walking, football, gymnastics, tennis all which take the children away from the device.

Entertainment and alternating between activities was a strategy that the parents used in order for the children not getting bored. Some parents prefer to alternate activities, with hobbies that they enjoy. One parent mentioned that:

"When I saw that he was gaming a lot, I decided to ask him what kind of books he liked to read and what stories he loved to hear. After he reads the book, we do activities together. I encourage him to discover his own skills and develop them."

Communication and discussion is an important element when dealing with children, but it needs to be done in a way that suits the child, not in a forceful manner. By communicating the right information to the children about excessive technology use, they will be able to absorb the information and accept it. As one of the parents said:

"It is important to communicate to the child about their duties and responsibilities, such as having time to pray, two hours for homework, two hours for activities, etc. This way, my son will feel responsible and knows how to schedule the day ...."

Following the communication of the information, some parents discussed with their children the importance of spending time together as a family. Additionally, this discussion is taking place as a persuasive argument, advice, or mutual discussion. As one of the parents said:

" I always have discussion with my son about the number of hours that he is using the device, but I discuss with him from the perspective that he is a human being and discuss with him the negative of this device and that it is better to spend more time with each other."

Power of parents and deprivation was another strategy used by some parents. Parents reported using the power and deprivation method with their children and they found it working and it gave them control and power over them. As one of the parents stated:

"I'm sorry to say this but using power and authority with your children is better as a father. Another parent said: *"I use deprivation as a method with my children, that is, if they did any mistake I deprive the device from him, he is not allowed the phone nor any device."*

Building agreement and trust is a technique that parents also used with their children. Several parents mentioned agreeing with their children on certain terms and conditions for when to use the device. One parent pointed out:

"The best way to deal with children and adolescents is to make an agreement with them. This age group is best suited to making agreements, but as parents, you have to stick to your word."

4.1.9. Successful digital parenting strategies

The importance of asking parents what strategies worked for them and how they implemented them cannot be overstated. From the interviews with the parents, a number of successful strategies were identified, including alternative activities, punishment and deprivation, persuasion, incentives, friendship, and discussion and negotiation.

Alternating between activities is a successful strategy for most families. Alternating activities can involve physical activities, reading, cooking, painting, sewing and other hobbies that the child enjoys. Alternating between these activities is essential so that the child does not get bored and is able to feel joy and entertainment. **Punishment and Deprivation** was a successful method for few of the parents interviewed. Deprivation means that parents take their children's devices away from them. Depending on the situation and how heavily the child uses the device and whether or not he/she has done their homework, etc., it could be days or hours.

Parents also used **persuasion** to move their children away from the device. Some parents used persuasion and the excuse of helping. **Incentives** were used by parents and was a successful strategy for many. Creating **a friendship relationship** appeared to be a successful strategy for a few participants, and the parents noted that it had a positive impact on their ability to stay away from the device. For some participants, **discussion and negotiation** were also useful methods. Children were able to gain a deeper understanding of the technology and a sense of responsibility.

4.1.10 Unsuccessful digital parenting strategies:

Deprivation was unsuccessful for some of the parents as it was a strategy that did not work with the children. Children tend to become more demanding if their parents deprive them of the device. **Limiting screen time** was another unsuccessful strategy for a few of the parents.

Punishment of children was another unsuccessful strategy. In response, children became more attached to the device, causing a negative reaction. Furthermore, continual punishment and enforcement or control was counterproductive because it gave a negative reaction and behavior to some parents.

Limiting usage by giving them the device at certain times did not work for some parents. By allowing the usage of the device on the weekend, the children want to remain on the device throughout the weekend to compensate for the time lost during the week.

4.1.11. Seeking help to manage the excessive use of technology

Most parents indicated that they do not seek help to be able to deal with their children's overuse of technology partly due to the fact that some of them do not see a strong reason to do that, whereas others were not aware that help was available for this kind of challenge. However, some parents clearly indicated that they looked for resources online to enable them to better deal with this issue.

No reason to seek help

Most parents indicated that they do not seek help as they did not see a reason for that. One parent clearly stated:

"No, I did not need help in this regard as things are not bad for my children. Their use of technology is not causing severe issues to them."

However, these responses should be considered with the strong stigma in many Arab societies against seeking help from psychiatrists in mind. It might be that some respondents deny the fact that they needed help from a specialist, but did not seek this kind of help to avoid the stigma.

Help or resources available

Many of the participants clarified that there is not enough help or resources available to the public. One parent stated:

"I do not think there is enough help out there or even resources available for parents to read and understand how to deal with the problem."

One parent clarified that there might be material or resources available, but that parents are not aware of them. This links back to the issue of lack of awareness raising or education of parents and other family members.

Seeking help

The small number of parents who reported seeking help mostly looked for resources online or asked friends or relatives. One parent who actively looked for resources stated:

"at times I went online to see if there is anything I can learn to be able to deal with this problem. I watched some videos and read a few articles that were relevant."

A few parents mentioned that they asked friends or family members for help.

4.1.12. Suggestions and recommendations for help

The participants are asked to make suggestions and recommendations regarding seeking help. All parents suggested awareness-raising campaigns, making information available and accessible to the public, intentional efforts by schools to educate the children and parents, among other suggestions.

One parent stated:

"If there are awareness-raising campaigns to help parents understand how to deal with this problem, this would be very helpful."

Another parent stressed the importance of making resources available:

"There must be information available online to help parents... information should be available on the website of relevant ministries such as the Ministry of Communication and other government organizations."

Several parents highlighted the role schools can and should play given that schools have contacts with students, teachers and that school leaders regularly interact with parents. One parent stated:

"Schools play an important role in the lives of children. They should organize lectures, events, or programs to educate the students and their parents about the importance of limiting the use of technology."

It is clear that although most parents did not seek help in managing their children's use of technology, especially by specialists or psychiatrists, they see the value of awareness-raising, education and providing resources in helping families cope with this challenge.

4.1.13. Changes in the use of digital technology after COVID-19

We asked parents if they had noticed any change with regards to their children's use of technology since COVID-19 started. We asked them about the change in the amount of technology use, purposes, applications used, problematic usage, and any changes in the discussions about the use of technology. The responses provide an indication of how COVID-19 affected the lives of adolescents and their families with regards to use of technology.

Level of use

Almost all respondents reported a significant increase in their children's use of technology due to COVID-19. This was mainly due to remote learning because of school closures and/or stay-at-home orders which were part of the restrictions in Qatar then. This was clear in the overwhelming agreement among the respondents.

Purposes

When asked about the purposes of using technology because of COVID-19, a wide range of responses was mentioned by parents including remote learning, doing homework, following social media, playing games and watching content. Clearly some or all of these activities were part of the children's daily routines during COVID-19.

Applications used

The applications used by the adolescents varied according to the parents' responses. These included Snapchat, Instagram, YouTube, and TikTok among others. However, there was almost consensus that the adolescents used Microsoft Teams, Google Classroom or other similar applications for schoolwork and online classes.

Problematic usage

When discussing problematic use of technology with parents, the majority reported strong attachment to technology, but very few mentioned problematic usage that result in negative impact on the adolescents. The majority of parents who reported problematic usage mentioned some videos as the main source.

Discussions within the family about the use of technology

Although all parents reported a significant increase in their children's use of technology, many did not report a change in discussions within the family about the use of technology during COVID-19. This can be due to the fact that parents understand that the children are staying at home most of the time and are using technology to attend online classes and do homework. However, some parents mentioned that they have started discussing their children's use of technology during COVID-19 as it became a cause for concern. One parent highlighted:

"I could not discuss this with them. They had nothing else to do, no other option to spend their time. It was not easy for them."

Clearly, COVID-19 has affected families in Qatar as in all other countries. The lockdown, school closures, and lack of opportunities for outdoor activities have limited the options for entertainment and forced many children to resort to technology as a getaway. However, we can see from the parents' responses that some families were impacted less than others, especially when it came to problematic use of technology and its associated challenges.

Box 1. Key findings from parents' interviews

- Children's relationship with technology was perceived by most parents as negative and unhealthy. A wide range of negative effects are associated with DA, including mental and physical health, education, and family relationships were reported by parents.
- There is clearly an excessive use of digital technology among parents and children as perceived by the parents interviewed. It is common for them to use technology excessively throughout the week and on weekends as well for various purposes.
- The most common characteristics of DA include excessive use, obsessiveness, preoccupation, and tolerance, loss of control, mood changes, and health problems. Understanding the actual experience of children with technology can be beneficial for parents to establish a more engaging dialogue and a less argumentative one with their children about this issue.
- A number of internal, external, and COVID-19-related factors have been identified as contributors to DA such as influence of peers (friends), the family environment, parents' lack of responsibility and awareness, ease of access to smart devices, lack of alternative activities, boredom, need for entertainment, communicating and socializing with others, studying and learning new things, etc.
- Parents use basic strategies, such as controlling devices or taking them away, monitoring, discussion, rewards, punishments and using alternative activities to distract their children.
- The findings also indicated that discussions between parents and children remain vague. Parents discuss generic consequences of technology use, neglecting that technology overuse itself might be a symptom or consequence of underlying issues. Digital literacy programs may focus on raising awareness of those immersive and, arguably, addictive, design features.
- Parents mostly blame themselves when asked who is responsible for their children's excessive use of technology.
- Parents recommended awareness-raising campaigns, making information available to the public, and educating children and parents intentionally.
- The lockdown, school closures, and lack of opportunities for outdoor activities have limited the options for entertainment and forced many children to resort to technology as a getaway.

4.2. Parents' perspectives: Quantitative findings

4.2.1. Demographic details

Descriptive Statistics of our participants are described in Table 1 (see appendix 1). Of the 216 parents who responded, 168 parents gave complete answers to the questions and were included in the study. Of the 168 participants in our study, 83.34% were from Arab and Eastern countries, mainly India, Pakistan, and 16.67% were from Western countries, mainly the USA, UK, Canada, and Australia. All the participants in our sample were residents of Qatar. 115 mothers (66.9%) and 53 fathers were in the sample (32.8%). The average age of parents was 41.82 (SD = 6.76, range: 26–65). The majority of parents were employed and almost all participants had an education level above high school.

4.2.2. Adolescents and technology usage.

Time spent on the internet: Parents were asked how much time their children spent on the internet every weekday and on weekends for study and personal development purposes. There were 125 responses to this question. Below is a table showing the average time spent on weekdays and weekends by gender. Results do not show much difference between male and female use. However, both males and females spend a greater amount of time on the internet during weekends for essential and non-essential activities.

Table 2. Average time children spent on essential and non-essential activities during weekdays and weekends by gender, according to parents

Gender	Average time per weekday on essential	Average time per weekend on essential	Average time per weekday on non-essential	Average time per weekend on non-essential
Female	2.46	5.5	3.78	5.23
Male	2.35	5.35	4.13	5.197

Monitoring children's internet use and activities

Parents were asked how often they observed and monitored their children's online time. Figure 1 shows the percentages of parents, by frequency of observation of their children online. Most parents report observing their children's online time, with 31% doing so occasionally, 33% sometimes, 10% often and 24% very often. Only 2% of respondents said they never observed their children's online time.

Figure 1. Percentage of parental observation of child's time on internet

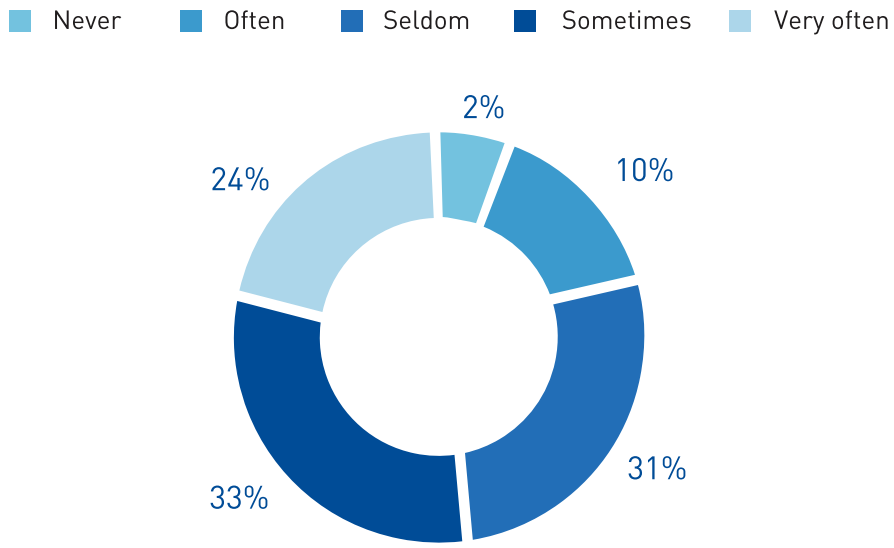


Figure 2 shows the percentages of parents, by frequency of monitoring the internet activity of their children. Most parents report observing their children's internet activity, with 30 % rarely doing so, 34% sometimes, 15% often and 16% very often. Only 5% of respondents said they never observed their children's online activity.

Figure 2. Percentage of parental monitoring of internet activity

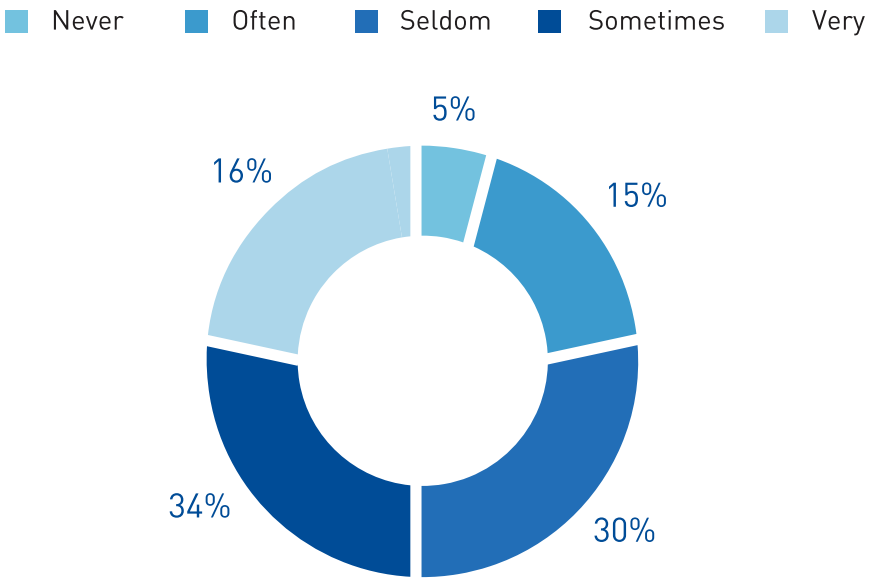


Figure 3 shows parents' estimates of the time children spend on the internet during weekdays and on weekends, for both essential and personal development activities, compared to their school performance.

Figure 3. Time spent on essential activities online, compared to student performance, reported by parents

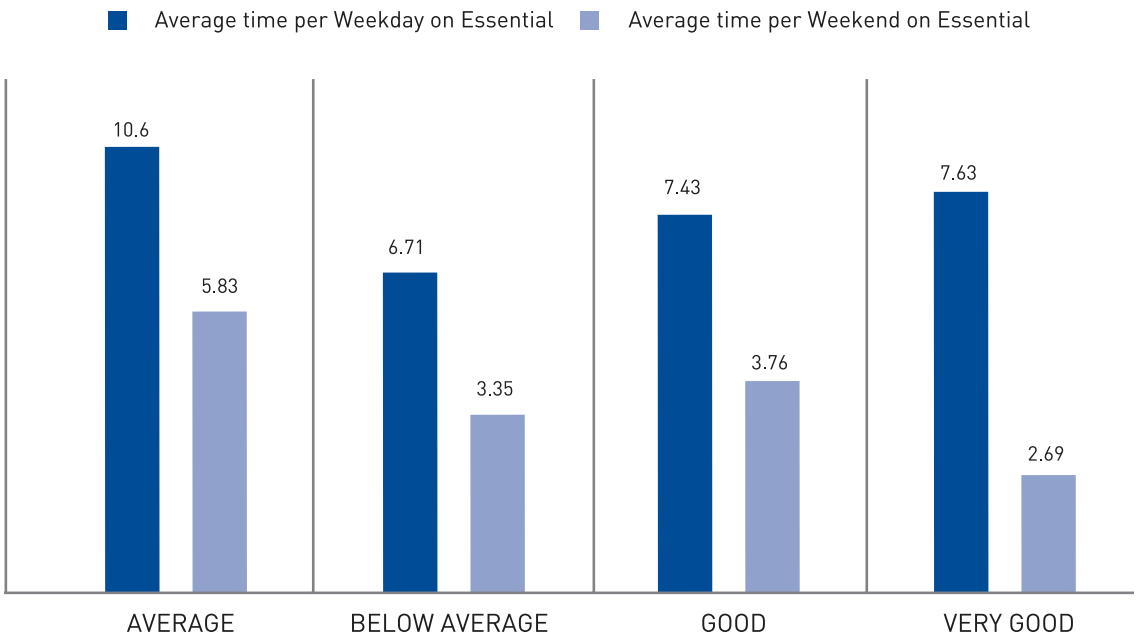
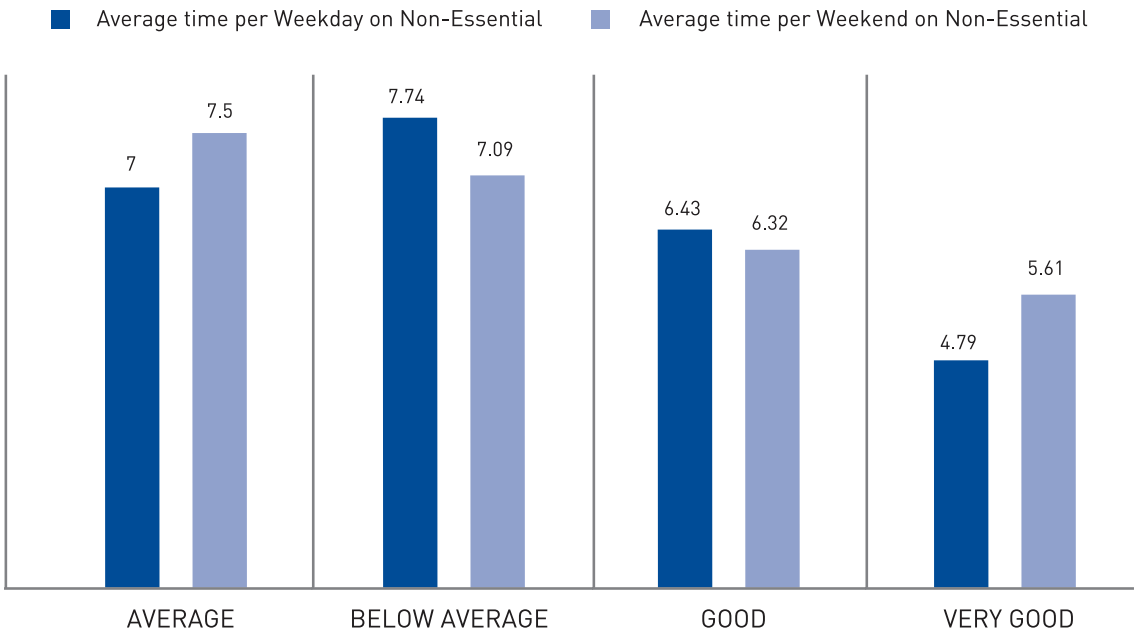


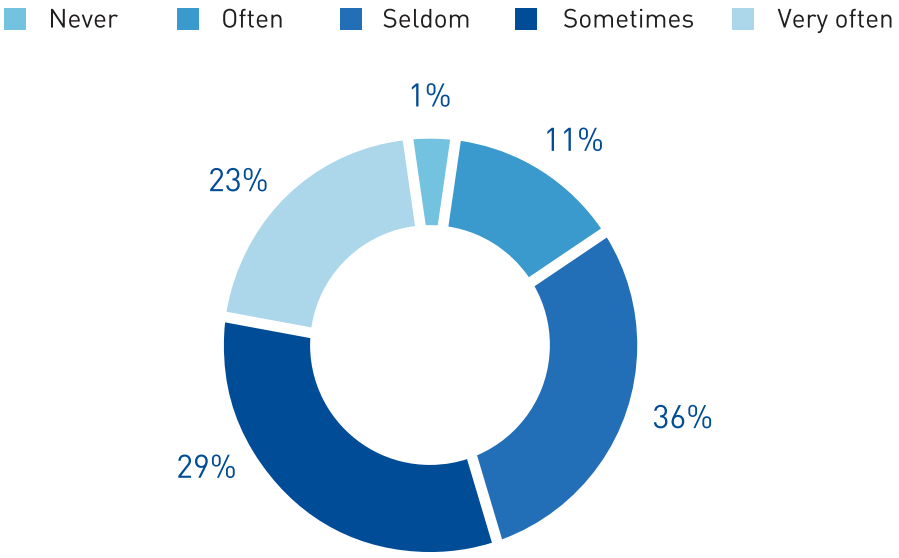
Figure 4 shows parents' reports on the time their children spend on the internet for non-essential activities during the weekdays and weekends, compared to their school performance.

Figure 4. Time spent on non-essential activities online, compared to student performance, reported by parents



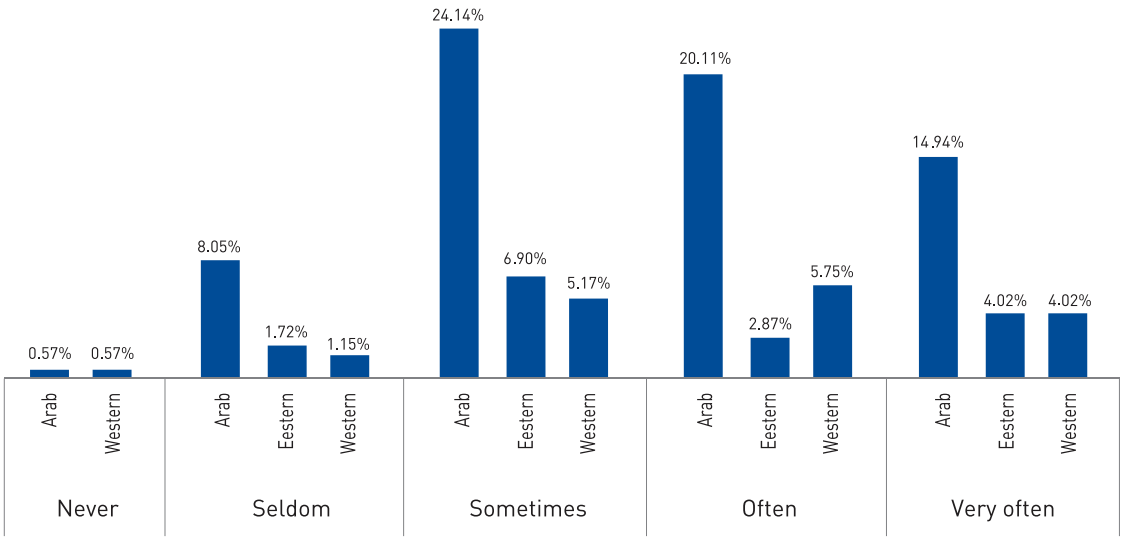
Arguments on excessive internet use: We asked parents how often they had serious arguments with their children. Figure 5 shows the frequency of serious arguments with children about internet use, as reported by parents. There were 173 responses to this question. It was found that parents argue with their children about internet usage in general. Approximately 36 percent of parents said they sometimes argue with their children about internet usage. 29% of respondents reported frequent serious arguments, and 23% reported very frequent serious arguments. Only 12% of parents said they rarely or never had serious arguments with their kids about internet use.

Figure 5. Frequency of serious arguments on internet use, reported by parents



In Figure 6, the frequency of serious arguments over internet use is shown, according to parent ethnicity.

Figure 6. Frequency of serious argument, reported according to parent ethnicity, in percentages



4.2.3. Internet addiction test

As internet use has become an integral part of human life, diagnosing internet addiction can be more challenging than diagnosing substance addiction. The internet Addiction Test Questionnaire (IAT) was developed by Young & Abreu in 2010[102] to capture the essential aspects of problematic internet use. In the IAT, parents were asked to answer questions about their own non-essential internet use. Moreover, parents were asked to fill out the Parental Assessment of Adolescent Problematic internet Use (PYDQ) developed by Wartberg et al.[99] The PYDQ is an appropriate measure for parents to assess problematic adolescent internet use (See appendix 2).

The symptoms of problematic internet use assessed by the IAT and the PYDQ are: "preoccupation" (Q1), "tolerance" (Q2), "loss of control" (Q3 and Q5), "withdrawal" (Q4), "risk/ lose relationships/opportunities" (Q6), "lies to conceal extent of involvement" (Q7), and "dysfunctional coping" (Q8).[102] Table 3 presents the internet addiction symptom and their prevalence in parents and their children.

Table 3. The prevalence of internet addiction symptom in parents and their children

Internet Addiction (IA) symptom	Prevalence of the symptom in parents	Prevalence of the symptom in children (as reported by parents)
Preoccupation (Q1)	56.80%	77.42%
Tolerance (Q2)	32.00%	70.40%
Loss of control – unsuccessful attempts (Q3)	44.80%	37.60%
Withdrawal symptoms (Q4)	20.80%	66.40%
Loss of control – unable to stay within limit (Q5)	66.40%	86.40%
Risk of losing relation or opportunity because of internet (Q6)	6.40%	24.80%
Lies to conceal extent of involvement (Q7)	7.20%	43.55%
Dysfunctional coping (Q8)	32.00%	36.29%

The below table presents the percentage of parents and children who meet each sum of IA symptoms, i.e. from none of the symptoms to the eight of them. In other words, it reflects the number of Yes answers to each of the questions in the IAT and PYDQ questionnaires where each of the questions represent a symptom of IA.

Table 4. The percentage of parents and children who meet each sum of IA symptoms as reported by parents

Number of IA symptoms	0	1	2	3	4	5	6	7	8
Children	2.90%	5.20%	8.00%	14.90%	16.10%	13.80%	20.70%	10.30%	8.00%
Parents	%16.10	11.50%	16.70%	19.00%	15.50%	10.30%	8.00%	2.30%	0.60%

Durkee et al. (2012) classified subjects as dependent if they responded yes to five or more of the IAT questions, and as at-risk if they responded yes to three to four questions.[103]

The PYDQ assesses problematic internet use in adolescents from the perspective of parents. The YDQ instrument's substance has not changed, however all eight items of the original YDQ have been reworded. According to S. Young, participants who responded "yes" to five or more of the questions on the YDQ were dependent internet users and the rest were classified as nondependent internet users. [98]

In 2001, Beard & Wolf [104] modified Young's internet addiction diagnostic criteria further, advocating that a person's ability to function normally may be impaired if all five criteria for internet addiction are met. Additionally, it was suggested that at least one of the last three criteria (e.g., criteria Q6: Parent, Q7: Parent, and Q8: Parent) be met in order to diagnose internet addiction. The last three criteria were separated from the others because they have an impact on the pathological internet user's ability to cope and function (representing depression, anxiety, and escaping issues, respectively), as well as their interactions with others (e.g., significant relationships, jobs, being dishonest).

Table 5 show IA prevalence in children and parents based on two different scoring criteria. The results in indicated that more than one-fourth of the parents were dependent Internet users, and more than half of the adolescents were dependent Internet users. Further analysis indicated that adolescents were more likely to be dependent Internet users when their parents were also dependent Internet users. Additionally, adolescents were most likely to exhibit Internet addiction symptoms when their parents exhibited similar symptoms.

Table 5: Prevalence of IA in Children and Parents based on Bakken et al. (2009) and Durkee et al. (2012) three levels scoring

IA in Children	Frequency	Percent
Non-Dependent Internet users	26	15.48
At risk of Dependency	52	30.95
Dependent Internet users	90	53.57
IA in Parents	**Frequency**	**Percent**
Non-Dependent Internet users	76	45.24
At risk of Dependency	56	33.33
Dependent Internet users	36	21.43

Awareness of solutions for resolving internet addiction in Qatar

Parents were asked if they knew of any services or information that could help them deal with excessive internet usage.174 parents responded. In Qatar 98.28 percent of parents are unaware of any local services to assist them in reducing internet usage. Local services that could offer support were shared by 1.72 percent of respondents. Several local resources were mentioned, including Behavioral Health Support Center (DAAM), Protection and Social Rehabilitation Center (AMAN), and Family Consulting Center (Wifaq).

Box 2. Key findings from parents' survey

- Technology overuse is widespread, and most families needed help in dealing with it. The majority of parents in this study expressed concerns over the effects of excessive technology use on their children's health, education, and family relationships. The COVID-19 pandemic has also blurred the lines of what we consider excessive and problematic technology use, as it blended study time with family time especially during remote learning.

- Children spend a greater amount of time on the internet during weekends for essential and non-essential activities and most parents report observing their children's time and activity on the internet. Also, adolescents were more likely to stay online longer than intended when their parents behaved similarly.

- More than one-fourth of the parents interviewed were dependent internet users, and more than half of the adolescents were dependent internet users. Adolescents were more likely to be dependent internet users when their parents were also dependent internet users. Additionally, adolescents were most likely to exhibit internet addiction symptoms when their parents exhibited similar symptoms. This underlines the importance of parents setting a good example for their children when it comes to technology use.

- Awareness raising about the phenomena in Qatar is limited; parents lack awareness about digital addiction and associated risks. Overall, the results indicate a need to address the issue in a more integrated manner, where education, health, and communication sectors can support families in maintaining a balance between their use of technology and other activities that foster bonding and cohesion.

4.3. Children's perspectives: Qualitative findings

Following are the main themes and subthemes that emerged from the qualitative results from the children's interviews and analysis:

4.3.1. Knowledge and source of information about DA

The majority of children have heard about DA from school or social media, or from friends, relatives, etc., while eleven participants have never heard of the concept of DA or know anything about it.

4.3.2. Children's relationship with technology, as perceived by children

The children interviewed had mixed opinions about the impact of technology overuse. Some reported that their relationship with technology could be negative, others reported that technology could have positive aspects. Very few participants were were neutral or unsure about the relationship. Among the negative impacts reported were both physical and psychological health issues (e.g., sight problems, back and neck problems, mental illness), social issues (poor behavior, lack of concentration and self-control, distraction, unsociability, social withdrawal, and lack of interaction with others).

As one participant stated:

"Children's relationship with technology is unhealthy... it affects sight, causing headaches and backaches."

Another participant said it could cause both low concentration and anxiety.

Regarding social issues, participants said overuse of technology leads to isolation and weak family relationships.

"I find it not healthy at all, as it causes the person to watch a lot of content, isolates him/her from family, and affects their mental health."

The positive impacts mentioned by some participants included the need to use technology for schoolwork and learning, to get new information, to socialize with friends, and to have entertainment.

"I think it's beneficial during COVID because of the social aspect and the educational aspects since the lessons and competitions are delivered online. It helped me with studies, information, and entertainment."

Most children reported that they used technology the same as their peers, while a small number reported that they used it more than their peers. Only a small number of children reported using technology less than their peers.

4.3.3. Meaning of DA to children

Children were asked what technology addiction meant to them; it was apparent that they understood the problem of technology addiction. They described technology addiction as following: using technology more than necessary, avoiding the real world, inability to do anything without technology, being stuck in the virtual world, not socializing, not able to leave their phones, expressing themselves only through technology, preferring solitude.

The common views of related studies confirm a three-fold classification of technology addiction for children: social network addictions (Facebook, Instagram, Twitter, Linkedin and YouTube), online game addictions (multiuser virtual environments) and instant messaging addictions (Whatsapp, Snapchat, Skype, Hangouts).

4.3.4. Patterns, purposes, and duration of technology use among children

Children were asked about the purpose and duration of their technology use. The majority stated that they used technology for various purposes, in varying patterns, and for different durations. As education and learning moves to remote locations, all students use technology to complete their homework and schoolwork. Several participants use it to play games, communicate with friends, social media, and watch online content (videos, TV shows, videos on YouTube, etc.). The majority of children use more than one device. Besides cell phones, most of them use laptop computers and/or tablets. All children use technology in the morning for schoolwork and homework in the afternoon and/or evening. They use technology throughout the week and on weekends as well. Most children spend four to eight hours a day using technology, and some even go as long as ten hours.

4.3.5. Factors characterizing DA, from children's perspectives

Children were asked when they would say someone of their age is using technology excessively, and most highlighted the amount of time. A number of participants mentioned using technology for between two and eight hours per day, sometimes more.

"When they watch online content all the time, don't go outside to play, and carry technology everywhere."

A few participants highlighted usage context as a contributing factor. It was reported by some participants that children at their age use technology excessively during weekdays and weekends even while they are in bed, eating, etc.

"If they are on their phones most of the time, I mean their spare time, eating, the second they wake up and before they go to sleep and when they are in the car."

People using digital media exhibit symptoms of behavioral addiction. These include social withdrawal and replacement of the real world, tolerance, obsession and preoccupation, loss of self-control, and mood modification when they check their online profiles regularly. With regards to **social withdrawal and replacement of the real world,** one participant pointed out that:

"When they are antisocial and isolated, they do not like to meet others, always alone. I have a friend, and when I ask her to play with me, she refuses because she wants to be on her phone. She is always isolated from her family. When they ask her to go out or play, she says no."

Obsession, preoccupation, and tolerance are also mentioned as signs of excessive use of technology. Many people feel compelled to engage with digital devices even when it is inappropriate or dangerous for them to do so. They become preoccupied with missing opportunities to engage with their online social networks if disconnected or unable to interact as desired. Adolescents are typically inseparable from their mobile phones as they use them to access the internet, social media, and other entertainment. Adolescents often fiddle with and use their mobile phones throughout the day. As one participant revealed:

"When they are attached to it and worry about it, there are those who are very afraid that their phones would break, and they would say, 'How can I live without it?'"

Loss of control also characterizes DA. Several mentioned that they spent more time on technology than they anticipated, and they can't live without their phones. Some reported having difficulty limiting their technology use.

"I sometimes have a hard time getting off my phone and doing something else... I do find myself being on my phone a lot more than I should."

Another sign of DA was **mood modification,** mentioned by few participants.

"You can tell by their appearance, dark circles from watching clips and using the device, being always distracted, having mood swings, and not doing their homework or studying."

Health issues are highlighted as signs of DA. Participants pointed out that excessive use of technology can cause health problems, such as insomnia, pack pain, vision problems, and difficulty concentrating.

"When they spend all their time playing and ask you to play with them... when they have wrinkles around their eyes or dark circles under their eyes... when they use it for more than ten hours and feel exhausted and tired, and sleep in class."

4.3.6. Reasons for DA, from children's perspectives

All participants indicated that their DA had developed over time due to using of technology excessively. We identified distinct external, internal, and COVID-19-related factors that contributed to DA.

External factors

A number of external factors led participants to use mobile phones and the internet to fit in with their peers, who accessed the internet. **Peer pressure** was reported by some participants to be one of the reasons triggering internet use.

"They see a lot of girls using their phones... around them. They want to be like them and think that they should use the mobile a lot too. So that they don't feel alienated."

The family environment was another external factor. Owing to the lack of intensity of relationship and interaction with the family members, the participants used internet and mobile phone as a means of distraction and to seek other relationships/friendships. Some participants reported that their parents are busy and do not spend time with them, so they get addicted to technology.

"Some parents do not have time for their kids, so they give them their phones so they can watch videos and listen to songs."

Using technology excessively is also caused by **parents' lack of awareness and responsibility.** Some of the participants reported that their parents unconsciously contributed to their children's addictive use of technology as they allowed it without supervision. As a result, technology will become a tool of socialization instead, and children will become more attached and addicted to it. Parents' time is often consumed with other work and household activities; they turn to digital devices to, in effect, "babysit" their child. Later on, parents may realize this mistake, and that they should pay more attention to their children.

"Because their parents do not monitor them, I think kids tend to use Twitter and YouTube excessively these days."

Technology design, easy access and popularity also contributes to technology overuse. New technologies are designed to encourage use, which is why children are passionate about exploring and learning through technology. Social networks, online shopping, and games, usually use persuasive and motivating techniques to keep users returning; once friends join the network, it becomes much harder to leave.

"I think it's become more popular over the past couple of years, and is more accessible, but also it's easier to talk to your friends and, in particular, to kind of have some down time when you get back to school."

Internal factors

Internal factors played a role, including loneliness, boredom, communication and socializing with friends, as well as games and entertainment online and with friends. Some participants reported that **loneliness and boredom** triggered using the internet.

"Usually, children use technology excessively when there is nothing to entertain them in real life, or their life is boring, so they go watch luxurious lives online."

Some participants pointed out that they used technology to **kill time and learn new things.**

"As a way to kill time or learn... like my brothers, they watch educational television programs, learn numbers from the television, and so forth."

Using technology was also associated with **entertainment** for children, especially as new technologies are designed to trigger continued use. Desire to engage in specific internet activities such as chatting with friends, updating, online shopping, and gaming led to internet use and dependency.

Communicating and socializing with others is another reason for technology overuse.

"I see that some people are antisocial. So when they are on phones, they get to know people without seeing them in person, they take a quick chat, go on their separate ways and turn off their phones."

Overuse of technology is related to **studying, learning, escaping school homework stress, problems at home, and unhappy moods.** It was mentioned by some participants that checking or using technology can be a useful way to distract or escape from an unhappy mood.

COVID-19 factors.

Limitations, regulations, and instructions to stay at home were part of the COVID-19 epidemic. In these times, children used technology excessively to communicate with their friends and relatives, since they were unable to interact physically and complete their schoolwork. Some participants reported that their use of technology has increased significantly (too much screen time) during the COVID-19 pandemic. Such an increase was difficult to control considering the need to stay home and quarantine for long periods of time.

4.3.7. Negative life experience, from children's perspective:

In general, children's perspectives of technology overuse were clearly more negative than positive, and that it negatively affects children. DA has been associated with a wide range of negative life experiences, including health, education, and family relationships. **In terms of health**, most participants reported that excessive use of technology results in dizziness, headaches, pain in the eye, back, hands, neck, and joints as well as a change in back posture, neck nervous tension, obsessing over keeping up with published content, insomnia, not getting enough sleep, weakness, gaining weight, etc.

"Using the phone for long periods of time can cause health problems such as pain in the eyes, back, hands, neck, and joints. It can also result in changes in back posture, neck tension, insomnia, lack of sleep, and obsessing over keeping up with published content."

The psychological effects of DA, such as depression, stress, anxiety, and fear, were also reported by some participants:

"Besides eye and back problems, excessive use of technology can lead to depression or other psychological problems."

In terms of education and learning, most participants reported that the impact of technology overuse is associated with poor academic performance because of lack of concentration and not doing homework. However, a few participants indicated that the use of technology had positive impact on the education of children, such as the expansion of knowledge, access to materials and other aspects.

"Instead of studying, they use the phone, which causes their academic performance to suffer, grades to drop...."

Overuse of technology is associated with **social problems and family disruption.** The social impact of using technology excessively was evident in the change in family relationships, as children become more socially disconnected and less

interested in family gatherings. The children show signs of detachment from the family, showing increased conflict with other family members. Children become socially shy and are unable to connect with others. A number of participants reported social problems and family disruptions as a result of DA. Participants preferred to stay online rather than interact with others, including friends and family.

"They spend lots of time in their rooms, only show up at mealtimes, don't spend enough time with their parents, and stay on their phones more... they isolate themselves and don't communicate with others."

DA can also lead to other issues such as overspending, violence, bullying, unloved relationships in friendship.

"Digital addiction leads to violence. Children watch people fight and imitate them at school. They might apply the violence they watch in real life."

4.3.8. Causes of DA, from children's perspectives

Children were asked who was responsible for children's excessive use of technology. The majority blamed parents and families. In their opinion, parents are responsible for the behavior of their children. They claimed that parents are usually busy, so they let their children use digital devices to keep them entertained. According to some children, however, the family can play a role in preventing and mitigating the effects of the problem.

"The family is primarily responsible for preventing this damage. For example, the father should set a specific time of day for tech use. Physical activities can also be organized to spend time away from tech such as going to the park or exercising at the gym. There should also be an app to control usage or lock the device after one hour. Parents can also take away the phone from their child and not allow it to be used on weekends or early in the morning."

Children have blamed schools for their reliance on technology. Schools have incorporated technology into nearly every aspect of education, and children are not taught about its potential negative effects. It is also possible for the school to reduce this problem by arranging lectures or awareness lessons on tech addiction. One participant said:

"Schools can also play a role in reducing this problem by organizing lectures or awareness lessons on tech addiction... The school should also organize activities that are as fun as using technology."

Some children blamed the government and claimed they should restrict children's access by blocking some of the sites to mitigate the problem. They think the government can play a role in spreading awareness in the society.

"Government, such as the Ministry of Education, can also organize lectures and make them optional for all students to educate them about tech harm. However, some sites should be blocked or block access to internet service by the Ministry of Communications."

Children blamed themselves for overusing technology. *"In order to stop the harm, the person has to take control for themselves, but they should get advice from older people, such as their parents and teachers."* Most children are aware of the importance of school, government, and technology companies in managing technology overuse. They are aware, however, that it is the parents' responsibility to control and mitigate the problem.

4.3.9. Parents help to limit excessive use of technology, from children's perspectives

To help children limit their excessive use of technology, we asked children how their parents help them. They revealed several strategies their parents use to limit technology use:

Power of parents: parental power is used by many parents in different ways. According to most children, their parents control their time and use of their devices. Throughout most interviews, deprivation emerged as a common strategy used by parents. Children say their parents take away their devices and give them back after a while. As most children said, this is a common strategy, demonstrating the degree of control parents have over their children.

"Sometimes they take my devices away so that I can go outside and talk to my family. They advise me not to use it too much."

Technology control is a common strategy as most children mentioned that their parents use it. Many types of control were mentioned by the children. Time control and screen control are two common ones:

Children refer to **time control** as the amount of time they are allowed to use technology. Some children said their parents allowed them to use the device for one or two hours, while others said they were allowed only on weekends. Parents also use screen control as a strategy. Children refer to **screen control** as setting a time and then closing the device so that it cannot be used further, and the parents have to unblock it for use.

Monitoring the children refers to watching how long and what the children do with the devices. According to two of the children interviewed, their parents have an application that allows them to monitor their children from their devices.

Most children pointed out that their parents give them **educational materials** to study, read, or practice. The majority of children mixed education and physical activities to reduce their use of devices.

Parents encouraged children to engage in activities used by almost all of the children. Two types of activities were identified: physical activities and alternating between activities. The majority of children mentioned physical activities to help limit the use of devices, such as playing outside, sports, walking, etc. Alternating between activities like cooking, playing with toys, reading, playing with siblings or friends, visiting family/friends, etc., was another option.

Children reported that their parents use **communication and discussion** as strategy such as discussing the positive and negative impacts of technology, and how it affects their health and education.

4.3.10. Successful digital parenting strategies, from children's perspective:

A number of successful strategy approaches were discussed in the interviews, including deprivation, control, quality time, activities, and discussion. Children mentioned **deprivation** --when parents took away devices-- as a clearly successful strategy. They found it useful because it would allow them to do other activities instead of using the device. Children found **control** -- limiting use during certain hours and/or specific days-- to be useful and successful. Others defined control as monitoring how much they used the device, and reminding them to stop.

Creating **quality time** for families and friends are successful, according to children. The activities discussed below are related to this theme, as it involves performing activities with family members while also spending quality time.

"We visit our grandparents or doing something unrelated to technology or mobile phones. We play with our cousins, do fun activities, talk to each other, and forget about our phones..."

Participating in activities such as sports, reading, cooking, and playing was a successful strategy for keeping children away from the devices.

It was noted that children were **advised** by their parents about the effects of technology. It was interesting that a few of the children cited their **parents' advice** and discussion as a successful strategy.

"It's successful because of the way they treat me and how they talk to me."

4.3.11. Unsuccessful digital parenting strategies, from children's perspective

Unsuccessful parental strategies described by children included deprivation, threats, attitude, and activities.

Taking away the devices was found to be an ineffective strategy by most children. According to the children, hiding their devices is not a good idea since they can find them or find other solutions, such as going to a friend's house. The children also indicated that **threatening** them was not a good strategy for them; some found it ineffective. Some children were concerned about their **parents' attitude** towards them. Shouting, and being angry are all ineffective ways to communicate with children. **Uninteresting activities** were unsuccessful as a strategy.

4.3.12. Family discussions regarding excessive use of technology

Children were asked about how parents discuss with them excessive technology use. A variety of techniques were used by parents to discuss with their children are advising, persuasion, awareness raising, and punishment.

Parents **advised** their children on the impacts of technology use on health and social relationships. Parents used **persuasion** to keep their children away from their devices, and steer them toward other activities. Children mentioned **awareness raising,** overlapping with advice-giving. Some parents used **punishment and deprivation.** A parent might punish a child for not going out with them; sometimes the child will feel guilty and may listen to the parents.

4.3.13. Main arguments parents use with their children for excessive use of technology:

According to the children, parents' main arguments with them related to health, education, socialization, and support at home. **Health** is a major concern among parents for most children interviewed. These included vision problems, back pain, neck pain, mental health, laziness and inactivity –all concerns children's health over the long run.

One of the main arguments parents made, mentioned by some of the participants, was the importance of **education**, and the need to focus on it. Some parents were concerned about their child's **socialization**. Parents worry that their children will be lonely and fail to adjust as they grow up.

Parents argued with their children that they do not **support** them with house chores in order to keep them away from technology.

4.3.14. Children's responses when disagreeing with parents

Children were asked how they responded when they disagreed with their parents. Their main responses emerged were acceptance, persuasion, anger, and refusal. Almost all of the children interviewed indicated **acceptance** as one of their responses. According to them, they accept what their parents say and do not argue a lot. Some children persuaded their parents to allow them to use technology for studying or other educational purposes. Another way children respond is to become **angry** when their devices are taken away. Very few children said they refuse to let go of their devices.

4.3.15. Ways to best manage excessive technology use

Most adolescents believed their use of technology did not lead to any harm, and did not feel a need for support or help. Some respondents directly asked their siblings, parents or teachers for support in reducing their use of technology. They mainly spoke directly to their family members. Others received unsolicited guidance from their siblings or parents as they noticed their challenges with technology use.

"I don't know if there are resources available, but parents' advice is important to address the problem."

4.3.16. Sources available for help and support

While a few adolescents did not know of or could not identify any available sources of help, some provided varied responses identifying a wide range of supports including reading materials (online or in libraries), videos, and school counsellors or social workers. Family support seemed to be a critical source of help for many children as parents and siblings are in direct contact with the children and can notice their technology use and offer support

4.3.17. Suggestions to best support adolescents

Most participants provided one or more suggestions on best ways to support adolescents as regards digital addiction. These included efforts by various organizations as well as family members:

Schools: organize talks or public lectures for the students and their parents; making resources and materials available and more accessible in school libraries and via online learning platforms.

Media organizations: Produce educational videos and TV programs to raise awareness of the impact of technology use; host experts and practitioners to discuss the problems related to technology use and provide guidance and suggestions for addressing the problems.

Parents and other family members: Implement screen time limits and parental controls at home which can help children reduce their use of technology for non-study related purposes; introduce more physical and family activities to engage the adolescents and reduce the time they spend using technology.

Health care authorities: Improve access to therapists and coaches who can support adolescents with digital addiction. This is important as many families are not aware of their children's need for therapy to manage their use of technology.

4.3.18. Changes in technology use during COVID-19, reported by children

The changes reported by children related to:

Amount of time spent: all participants reported an increase of their use of technology with the beginning of the COVID-19 pandemic, with most participants reporting a significant increase in the time they spent using technology for two main reasons:

1. **Remote learning:** With the announcement of the pandemic, all schools in Qatar moved to remote learning in March 2020. Students had to use technology to continue their learning; accessing learning materials, attending virtual classes, participating in other remote learning activities, and submitting homework and assignments online. This limited the abilities of families to enforce screentime limits and other measures to reduce their children's use of technology.

2. **Lockdown and lack of other activities:** COVID-19 forced schools and students to resort to remote learning and limited options for outdoor activities previously available. Although Qatar did not enforce extreme lockdown measures put in place in other countries to reduce the spread of the virus and contain its impact on public health, public parks, cinemas, gymnasiums, malls and other facilities were closed for extended periods of time. The ability of families to enjoy the outdoor activities was reduced, family visits were limited to small gatherings. These measures and restrictions meant that children spent all their time at home, and lead to the significant increase in technology use for entertainment and communications.

Usage purposes: all participants reported changes in their technology usage purposes. The three main purposes for using technology identified during COVID-19 were:

1. **Education and learning:** Although some students, especially those in private and international schools, used technology before COVID-19, all students, in public and private schools, had to use technology for remote learning when schools were closed. Schooling and remote learning became the main purpose students used technology over the past two years.

2. **Entertainment and gaming:** Many students reported that the lockdown meant having free time for entertainment and gaming. The main sources of entertainment for most students was watching content such as YouTube, TikTok and other streamed content.

3. **Communication and social media:** Children could not meet during or after school to play and talk; they resorted to communicating on their devices. With the spread of communications apps such as WhatsApp, Discord, Telegram, and other children started interacting virtually and sharing stories and updates.

Accessing social media globally increased significantly during COVID-19 among children and adults. In addition to the impact of lockdown and more free time, there was a greater influx of news, updates and rumours related to COVID-19 and its impact on societies, the economy and healthcare systems. Most students reported using social media during COVID-19 to follow their friends and share their updates and information.

Applications used

All students reported changes in the applications they used once COVID-19 started. These varied from learning-related applications such as Microsoft Teams, Google Classroom among others, to communications applications such as Whatsapp, Discord, and Telegram, and social media applications: Instagram, Facebook and Twitter. Some students also reported that they started watching content on YouTube and TikTok, which they had not used before the pandemic.

Problematic use

The participants' responses regarding problematic usage of technology during COVID-19 varied. While some students reported significant increase of their use of technology that led to problems with their health, attention or other aspects of their lives, others indicated that the increased use of technology had not led to any issues or digital addiction.

Dialogue amongst adolescents and their parents about digital technology usage

Some students reported increased frequency of discussions about this issue within the family. Some highlighted family arguments. The main concerns that triggered these arguments were the impact of technology use on children's health, learning, and social relationships. This was clear in the reactions of some participants. However, several participants did not report any changes related to the dialogue amongst the family members about the use of digital technology.

Box 3. Key findings from children's interviews

- The majority of children used technology excessively and for various purposes, in varying patterns, and for different durations.
- Children using digital media were found to exhibit symptoms of behavioral addiction such as social withdrawal and replacement of the real world, obsession and preoccupation, loss of self-control, and mood modification when they check their devices regularly.
- A number of internal, external, and COVID-19-related factors have been identified as contributors to DA such as influence of peers (friends), the family environment, parents' lack of responsibility and awareness, ease of access to technology, lack of alternative activities, boredom, entertainment, communicating and socializing with others, studying and learning new things.
- Children's perspectives of technology overuse were clearly more negative than positive and has been associated with a wide range of negative life experiences, including health, education, and family relationships.
- While adolescents are aware of the harmful side of technology, they still think technology is not all harmful, and that it is needed for their development and growth. The medium itself is mixed, complex, and the issues are fine-grained.
- Children have blamed parents, schools, government, and themselves for their reliance on technology.
- According to children, parents use basic strategies to limit technology overuse, such as controlling devices or taking them away, monitoring, education, discussion, rewards, punishments and using alternative activities to distract the children.
- Regarding the strategies followed by parents, and what is seen to be a useful strategy, while parents saw strategies like deprivation to be potentially successful, children had mixed views. Some thought that fear of missing out and preoccupation with their devices could be much more harmful and time-wasting than allowing them to use their devices.
- A variety of techniques were used by parents to discuss the impact of overuse of technology with their children such as advising, persuasion, awareness raising, and punishment.
- Generally, children were more in favour of openness about technology use than parents. Still, children seemed to acknowledge that a degree of coercion might be needed.
- It seems parents and children do not differentiate between the various types and modalities of use, and both seem to approach the problem in a less nuanced way. Digital literacy programs may focus on raising awareness of those immersive and, arguably, addictive, design features.

4.4. Children's perspectives: Quantitative findings

4.4.1. Demographic details

Descriptive statistics about the children's sample is shown in Table 6 (see appendix 1). Of the 586 children who responded, about 80.2% of the sample were females, and 19.8% were males. The average age of the children who filled the survey was 13 (Minimum:10, Maximum: 16). Among the children who participated in our study, 75.4% were Arabs and 23.6% were non-Arabs and the majority attend public schools (65.0%. More than half of participants (53.0%) reported that their overall academic performance was very good, 34.5% said good, while 12.7% of the participants reported below average, and average. The majority of participants reported that their parents were employed and almost all of their parents had an education level above high school.

4.4.2. Adolescents and technology use

Time spent on the internet: We asked children about the average time they spend on the internet for study purposes and personal development, as well as other activities, during the week and weekends. Table 7 shows this information for each gender. Results do not show much difference between male and female use. However, both males and females spend a greater amount of time on the internet during weekends for essential and non-essential activities.

Table 7. Average time children spent on essential and non-essential activities during weekdays and weekends, by gender, according to children

Gender	Average time per weekday on essential	Average time per weekend on essential	Average time per weekday on non-essential	Average time per weekend on non-essential
Female	2.6	2.0	4.3	5.5
Male	2.9	2.1	3.7	4.5

Figure 7 shows responses from children (both genders combined) about how they felt about using digital technology for non-essential purposes. The majority of children reported that they were happy with using digital technology for non-essential purposes (67.0%), while 11.0% reported that they were unhappy with it . About 21.0% reported that they were neither happy nor unhappy with it.

Figure 7. How do you feel about the time you use digital technology for non-essential purposes?

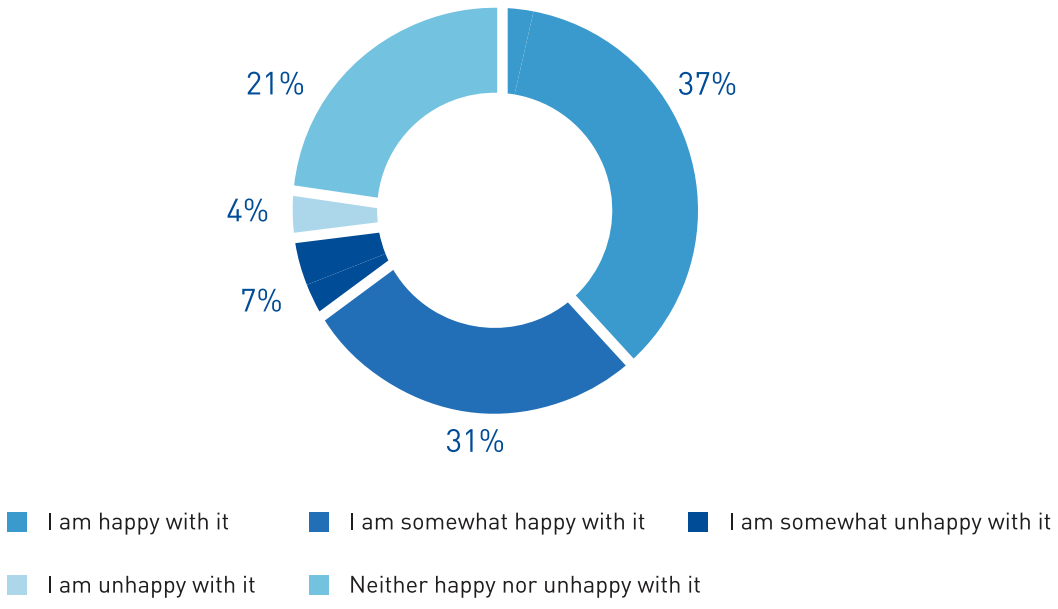
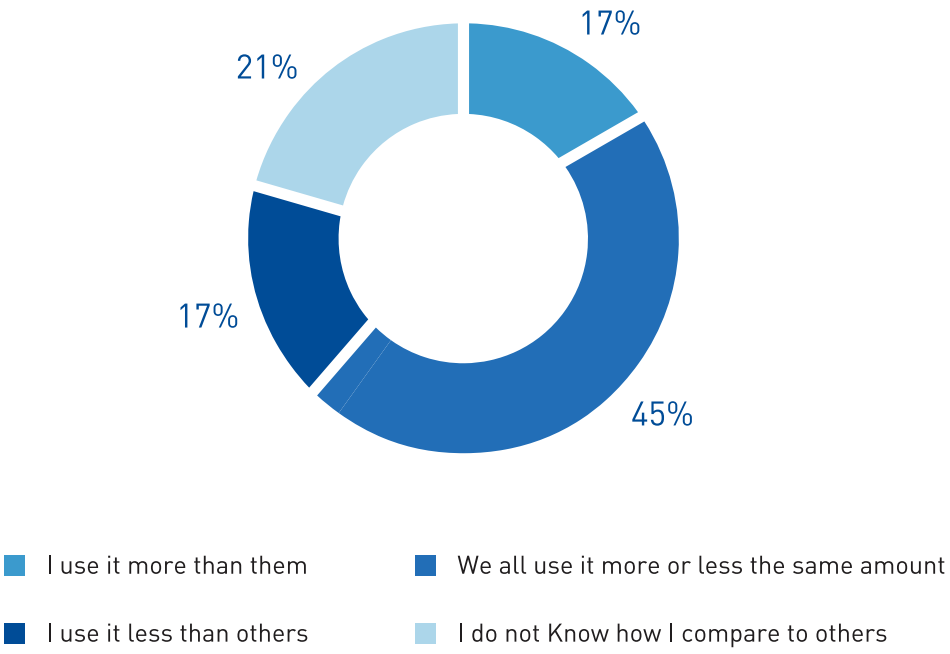


Figure 8 shows the responses children gave (both genders combined) when asked whether they used digital technology more, or less, or the same as their classmates.

Figure 8. Technology use reported by children, compared to their classmates



4.4.3. Monitoring children's internet use and activities

Figure 9. Percentage of parents' observation of children's time on internet

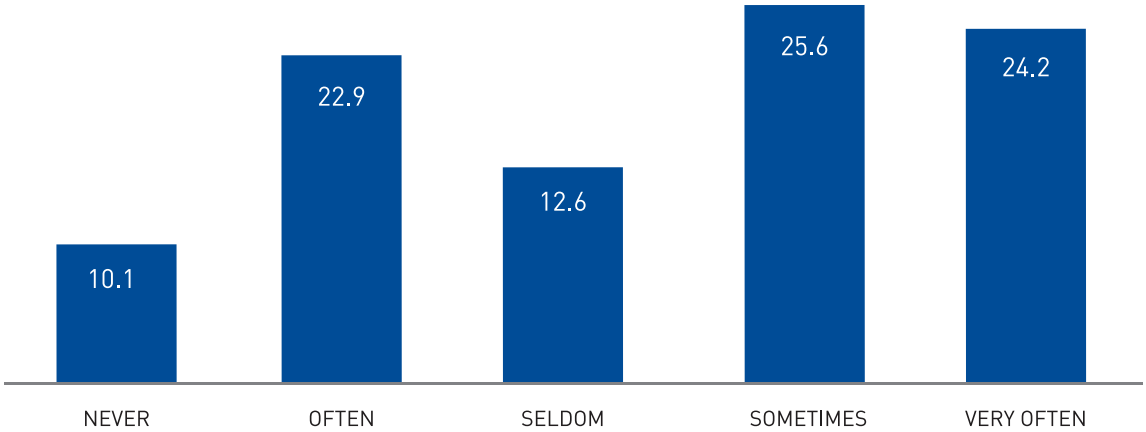
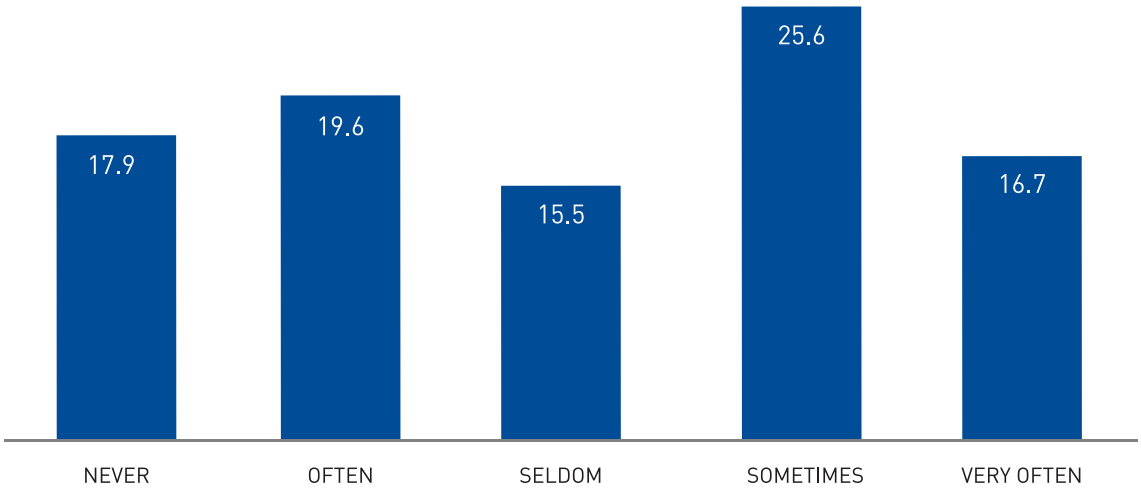


Figure 10. Percentage of parents' observation of children's activities on internet



Students' performance based on time spent on the internet.

Figure 11 shows the number of hours spent on the internet during the weekday and weekend, on essential and personal development activities, with levels of educational performance, reported by children.

Figure 11. Online time for essential activities, compared to performance, reported by children

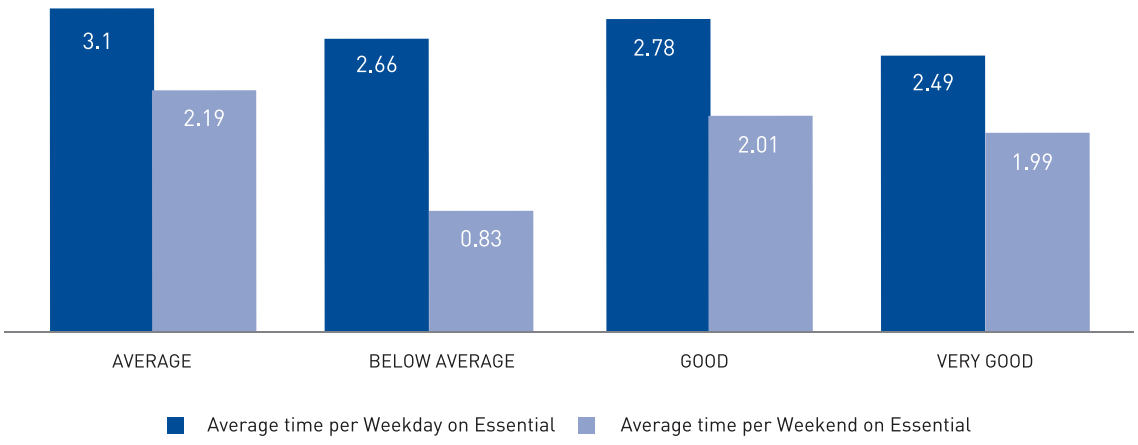
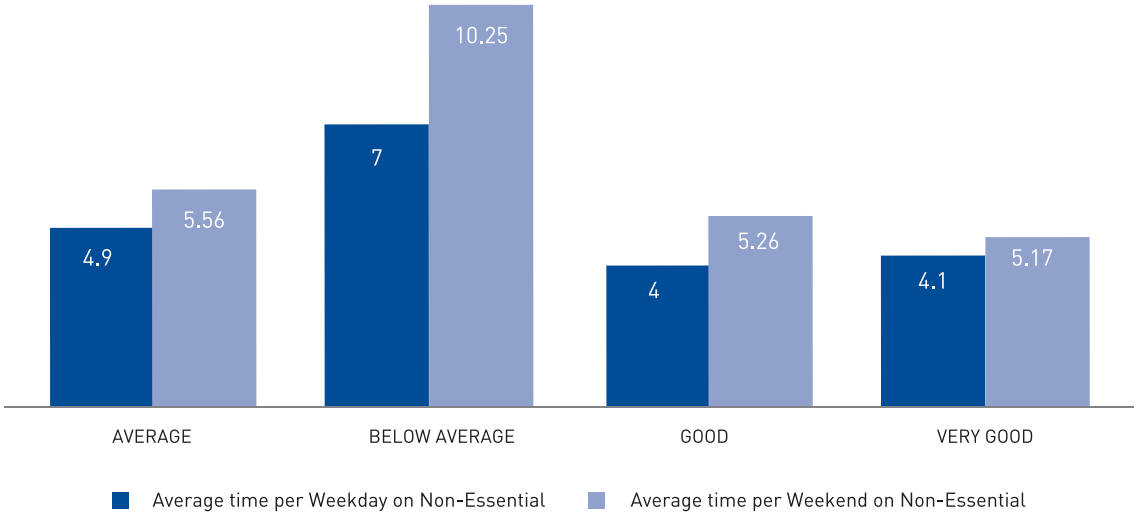


Figure 12 shows the number of hours spent on the internet during the weekday and weekend on non-essential activities, with levels of performance, reported by children.

Figure 12. Online time for non-essential activities, compared to performance, reported by children



4.4.4. Internet Addiction Test

The Young Internet Addiction Test Questionnaire (IAT) is a trustworthy measure that captures the essential aspects of problematic internet usage.[98] Children were asked to respond to questions about their non-essential internet use. Below is the IAT questions used in our survey (See appendix 2).

The criteria of problematic internet use assessed by the IAT and the PYDQ are "preoccupation" (Q1), "tolerance" (Q2), "loss of control" (Q3 and Q5), "withdrawal" (Q4), "risk/ lose relationships/opportunities" (Q6), "lies to conceal extent of involvement" (Q7), and "dysfunctional coping" (Q8).[98] Table 8 presents the internet addiction symptom and their prevalence in children.

Table 8. The prevalence of internet addiction symptom in children, reported by children about themselves

Internet Addiction (IA) symptom	Prevalence of the symptom in Children (as reported by children about themselves)
Preoccupation (Q1)	48.10%
Tolerance (Q2)	31.40%
Loss of control – unsuccessful attempts (Q3)	42.70%
Withdrawal symptoms (Q4)	39.10%
Loss of control – unable to stay within limit (Q5)	57.50%
Risk of losing relation or opportunity because of internet (Q6)	23.70%
Lies to conceal extent of involvement (Q7)	22.70%
Dysfunctional coping (Q8)	61.40%

The below table (9) presents the percentage of parents and children who meet each sum of IA symptoms, i.e. from none of the symptoms to the eight of them. In other words, it reflects the number of Yes answers to each of the questions in the IAT answered by the children.

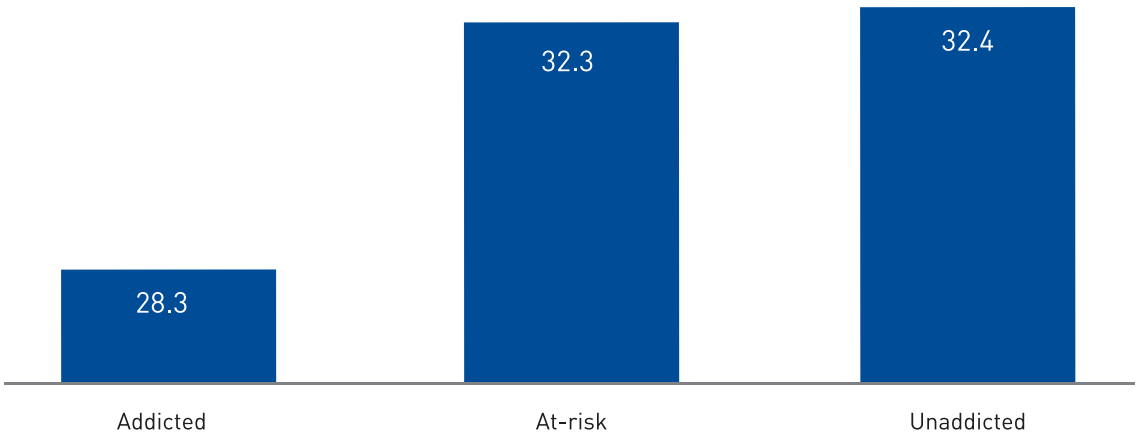
Table 9. The percentage of children who meet each sum of IA symptoms, reported by children

Number of IA symptoms	0	1	2	3	4	5	6	7	8
Children	7.50%	11.70%	15.60%	17.80%	16.90%	13.80%	9.70%	4.80%	2.20%

As stated by Durkee et al., subjects can be classified as dependent if they answered yes to five or more questions on the IAT, and at-risk if they answered yes to three to four questions.[103] Young's internet addiction diagnostic criteria were further amended by Beard & Wolf (2001), who advocated to include all of the first five criteria for diagnosing internet addiction, even if these criteria do not impair the person's daily functioning.[104] Additionally, it was suggested that at least one of the last three criteria (e.g., criteria Q6: Parent, Q7: Parent, and Q8: Parent) should be met in order to diagnose internet addiction.

Figure 13 further shows levels of the impact and risk of technology use among children, from unaddicted to addicted, by percentage according to the IAT scores. More than half of the adolescents in this study were internet dependent or at risk of addiction, while one third weren't.

Figure 13. Percentages of children who are addicted, at risk, and unaddicted, according to IAT scores



4.4.5 Additional analysis

To test the relationship between IA in children and health, education performance and environment, and family relationships, bivariate analysis using Pearson's Correlations was performed. The Internet Addiction Diagnostic Questionnaire (IADQ) developed by Young K. S. (1998)[98] was used to measure the internet addiction in children. Concerning the health aspect, we have used the Chalder's Fatigue Scale which measures physical and mental fatigue[105]. We also measured the levels of depression, anxiety and stress through the DASS scale proposed in[106]. Table 10 (see appendix 3) shows the Pearson Correlation between the total score of Internet Addiction (IA) on the one hand, and the Stress, Anxiety, and Depression scores, and also the fatigue, both physical (FSPhysical) and mental (FSMental), on the other hand. The analysis shows a significant positive correlation between Internet Addiction score and stress, anxiety, depression, mental fatigue, and physical fatigue.

We measured the family relationship through Brief Family Relation Scale (BFRS) proposed in Fok, Allen, & Henry (2014)[107]. The scale has three components family cohesion, family conflict-free, and expressiveness. We also asked the children on the frequency their parents monitor the amount of time they spend online and their online activities. The Pearson correlation is shown in Table 11 (see appendix 3) , where internet addiction is significantly and negatively correlated with all the other variables.

To measure other variables related to family environment, such as gatherings and eating habits, we have utilized questions proposed by the Health Behaviour In School-Aged Children (Hbsc) Study Protocol[108] . Table 12 (see appendix 3) shows a significant negative correlation between Internet Addiction (IA), and eating sweets, cakes and soft-drink. At the same time, IA is significantly and negatively correlated with having breakfast and evening meals together as a family and with having healthy food such as fruits and vegetables.

With regard to education performance, the Pearson correlation in Table 13 (see appendix 3) showed a significant positive correlation between Internet Addiction (IA) and the level of pressure (School pressure) and having problems in completing schoolwork (School work problem). It also showed a significant negative correlation between IA and the positive feeling about school (School feeling), the self-declared level of performance (Education performance) and also the level of performance as evaluated by the teachers compared to other students (School comparative).

Box 4. Key findings from children's survey

- The excessive use of technology has been found to negatively impact the health and education of children, as well as their family relationships.
- The COVID-19 pandemic has also blurred the lines of what we consider excessive and problematic technology use, because it integrated study time and family time.
- Adolescents spend a greater amount of time on the internet during weekends for essential and non-essential activities than during the week. Also, they were more likely to stay online longer than intended when their parents behaved similarly.
- The majority of children reported that they were happy with using digital technology for non-essential purposes. However, it is also interesting to note that not many children are unhappy with their technology usage (11 percent).
- Most children reported that their parents observe their online time and activity.
- Adolescents were more likely to be dependent internet users or at risk of addiction and they were most likely to exhibit Internet addiction symptoms when their parents exhibited similar symptoms.

4.5. Practitioners' perspectives: Qualitative findings

4.5.1. Demographic and practice

The majority of social workers interviewed work in the public sector in Qatar, either in hospitals or in ministries. Two practitioners work in an NGO center for behavioral therapy and another in a semi-government hospital. The majority of practitioners interviewed, except for three Qataris, are expatriates as Qatari practitioners in this field are few. All practitioners have graduate degrees and/or specialized training in one or more fields of psychology or clinical psychiatry. Most practitioners have more than five years of experience, with some having as much as 20 years of experience in the field. None of the practitioners interviewed specialized mainly in digital addiction; they treat cases of digital addiction among other mental health cases in a wide range of age groups.

4.5.2. Institute experience in dealing with digital addiction

As reported by the practitioners interviewed for this study, there are no specialized services in Qatar designed to manage digital addiction issues. Most digital addiction cases will be treated by general psychiatrists using psychosocial interventions. As one practitioner indicated:

"Currently, we do not have any digital addiction management services in Qatar, but we are getting more and more referrals this last year; ...most of the time, they fall into the same category as patients who struggle with depression anxiety, and emotional regulation problems, self-harming behavior. Most of the patients are female and they use electronics for over ten hours a day."

4.5.3. Awareness raising efforts

Awareness raising efforts to combat digital addiction implemented by institutions or the government in Qatar are very limited. Although this is the case in many countries, some have recognised the negative impact of digital addiction on adolescents and youth, and have made efforts to raise awareness and educate the public about this phenomenon. As stated by several practitioners, most of the awareness raising efforts are in the form of workshops, presentations, conferences, and seminars.

"Raising awareness efforts has a multi layers... at the clinical setting, there [is] not much information about DA, as it is relatively new. So the first layer includes raising awareness amongst clinicians and staff. This has been done through grand round presentations, educational rounds with residents, fellows, MDTs, and with the grand rounds at the psychiatry department. The second layer is the efforts that they are doing in CAMS [involving] schools by doing presentations on raising awareness related to digital addiction and excessive digital use."

Some centers, such as Daam, have a social awareness department which provides lectures and awareness guidelines for parents, conducts TV shows, and uses social media (Twitter, Instagram, Facebook, etc.) to spread information about technology addiction. Parents are also trained by psychologists and social workers through conferences and seminars; psychologists and social workers are trained on the topic. According to some practitioners, schools make limited efforts to raise awareness of digital addiction among students and parents. This should change as schools play a critical role in the lives of students and are usually in contact with their parents regarding academic performance and other issues.

4.5.4. Preventative measures

Some families and practitioners are taking preventative measures to reduce the impact. Parents limit screen time for their children; some block specific websites or content types, and many families monitor their children's use of technology and encourage physical activities. Other prevention measures include encouraging activities, sports, and educating parents about social activities that could keep their children away from technology. Giving prizes to children for activities can motivate them. As most practitioners reported, the most common method of preventing digital addiction is to provide parents basic information regarding internet addiction through workshops, lectures, conferences, with an emphasis on facts about its adverse consequences. Few practitioners mentioned modeling behavior as a preventative measure. This method is widely used to determine what needs to change for behavior change interventions to be effective.

"These... devices... [are] everywhere, and modeling behavior is very important. So often parents, friends, and family members use them excessively in every corner of their lives, whether it's school, entertainment, or anything else. So... a lot of that is modeled behavior... they're learning to use it too much because the school tells them to and their parents tell them to, or the parents are doing it themselves. So that's where the things have to start shifting, especially from a preventative aspect. Parents need to... restrict their use their own use, as well as their children's use, [so] when they restrict their own, they're going to restrict their children."

4.5.5. Treatment of digital addiction

Treatment of digital addiction in Qatar is not advanced and is not defined as other types of addictions, such as drug addiction. For example, harm reduction, prevention and treatment measures are usually bundled together, and take the form of consultation sessions with the parents and the child, providing guidelines and training parents how to react and deal with a situation. As mentioned by a family practitioner:

"...mainly it is [an] advisory session for the parents in how to deal with DA and be aware themselves of technology and how to prevent addiction. By guiding the parents in preventive measures, the child can imitate and take the right path. We seek that the person have a balanced attitude and behavior... to overcome the addiction."

Psychosocial intervention approaches are widely used in treatment and intervention, and most have been proven to reduce DA levels or reduce time spent with digital devices. Such approaches include cognitive behavioral therapy (CBT), education strategies, and others.

"We use the harm reduction model usually when it comes to electronic addiction, and the primary methodology... is displacement strategy. You displace the electronic use with something else, so there are periods of abstinence... [the child may] cut off one hour [of use] a day, and... [replace it with] doing something whatever they enjoyed previously, cooking, a hobby, a sport."

The practitioners noted that there is no official program offered to reduce harm of digital addiction in Qatar, but some content is available on websites of NGOs; most addiction cases are treated through psychosocial intervention.

"As far as I know, there is no ... designated program in CAM in Qatar... As a result, we would only be able to work on the outpatient component. We are still trained to manage and treat patients with addictions in general; we aren't a specialized service. However, we do know the basic principles of managing addictions, which is ... a gap in the system that we are trying to fill."

According to a senior practitioner and medical professor, Qatar's medical residency programs include a module on internet addiction. It covers digital addiction, gaming disorders, and others. The UK, Canada, and the United States have programs designed to help children with digital addictions and their families. In terms of awareness raising, there are no official programs delivered in Qatar, but there are some efforts by schools, social and family centers, and health sectors to educate the children and their parents about the rational use of technology and its adverse consequences.

4.5.6. Method of service delivery

Referral-based service delivery has been mentioned by some practitioners. The referral process can either be initiated directly by parents as guardians or indirectly by patients themselves through school counselors or the ministry of interior. There is the helpline pathway, so patients or parents can call the 16000 number directly, and they can speak to a mental health professional directly, or they may walk in.

During the pandemic, information regarding DA treatment and management was widely disseminated on social media news, printed media, even by text message. The information around the actual treatment or management will all be done in-house at the clinic.

"Due to the COVID situation... the information is widely disseminated publicly on social media news, printed media... information is widely available [and] is ...stratified. Some are very well known ...like the helpline, while others are ... restricted to the clinical setting."

4.5.7. Measures of success and efficiency of treatment approaches, and the services implemented

Most practitioners responded that their institutions measure treatment and intervention success, not program success, as there are no formal programs in Qatar for treating DA. In most cases, the clinical setting or center evaluates how the client progresses and functions.

"We don't have very clear evaluator tools other than clinical ones. When we see patients, we evaluate them clinically and based on how they progress, that's kind of how we gauge things, but it's not measured in numbers or quantified in any way, it's just measured as part of the patient's progress just like anxiety or depression or whatever it is. ... It's just based on clinical judgment, really, and how the patient feels and how the parents view it."

Some centers evaluate patients. A three-month evaluation is also conducted, and an annual evaluation. Many practitioners, however, do not perform formal evaluations and rely primarily on feedback from parents or children who have received treatment or support at these facilities. As one practitioner mentioned:

"We don't offer anything formal; we just get some verbal feedback from the family in the in the closing of the of the therapy."

Practitioners have various opinions on the effectiveness of treatment approaches and services. Some are positive about the center and the services it provides.

"The center is good and developing. The team meets weekly to share knowledge and conduct training on a particular topic. The practitioners receive continuous education and training, which is beneficial and helpful, and more development is on the way."

A few practitioners, however, believe the treatments are not successful. Others could not provide any judgement given the lack of programs in the first place.

4.5.8. Challenges in program and services delivery

The practitioners highlighted several challenges in the delivery of DA services. Some reported discontinuity of patients in treatment, workload, a shortage of staff, the need for conducting research, a lack of support for families in the treatment process, limited awareness raising, and lack of family commitment. Others noted that there are no addiction services, no designated pathways for patients with electronic addictions, no dedicated team or expertise, and limited resources.

There are other challenges, including a lack of awareness among parents and the general public in Qatar of the risk of digital addiction for their children, and the stigma associated with it. Many parents are unaware of digital addiction's potential impact on their children. The stigma toward psychotherapy in the Arab culture seems to act as a deterrent to families. Some families are aware of the dangers of DA, but they ignore it and don't want to reveal that their children are involved. As mentioned by one family practitioner:

"Some families do not want to get help and support. The lack of support of the family is a problem to the practitioners and the treatment."

Obtaining information and help is a challenge as families may know that DA can be dangerous, but they ignore it and don't want to disclose that their children are impacted. This is a challenge for practitioners and patients alike. As stated by one family practitioner:

"There are some families who do not want help and support. The problem is affecting everyone, and adults are mostly on their phones, causing distortion in the family, and families ignore the fact that their members are addicted." A few practitioners, indicated that they did not identify specific challenges in program/service delivery because their institutions do not offer programs.

4.5.9. Suggestions for improvement

Below are some improvements suggested by the practitioners.

Digital campaigns to raise awareness among families

It is important that all ministries collaborate and work with the families on how to overcome this problem through awareness raising. The government should implement digital campaigns to familiarize families and members of society with the potential risks of digital addiction to children. This can be done through short videos, text messages, or other forms of digital media.

"There need to be social media campaigns on digital addiction, more studies to understanding the challenges of families, address them and work towards solving the challenges. Families need more time to spend with their children, revisiting work-family policies; most working parents are not socializing with their children."

Awareness raising in schools

Awareness-raising campaigns are needed in schools to teach students, parents, and teachers about digital addiction. School campaigns can have a great impact on students, and teachers can reinforce them often in class.

"...the education system [should] provide awareness of the safe use or appropriate use of the digital world, appropriate use of media and educating children on the positives as well as the negatives that come out of it so that there is a more informed approach."

The Ministry of Education and Higher Education should work with schools to add a subject on technology and begin teaching it to children at an early age about its pros and cons and how to use it effectively. Schools can notify parents of any behavioral problems.

Awareness raising for physicians and other healthcare workers

Health authorities and hospitals in Qatar need to educate physicians about the symptoms of excessive use of technology. Orthopedists, ophthalmologists, and other medical practitioners should be aware of the effects of digital addiction on adolescents.

"The most developed tools should be for physicians, less developed or some basic checklists should be available for parents and for teachers and even for self-assessment."

A public awareness campaign and discussion about the issue must also be conducted by the ministry of public health. There is a need to coordinate with health centers and other entities and educate them about healthy lifestyle.

Legislation and regulation to restrict digital technology use

The government needs to block some of the sites that children use. The government can also play a role in spreading awareness about the issue, setting legislations and regulations in the use of technology.

Box 5. Key findings from practitioners' interviews

- Digital addiction treatment is not advanced in Qatar; no official program is offered, and most addiction cases are treated through psychosocial intervention.

- Practitioners revealed that the currently available approaches are for general behavioral issues, such as procrastination and excess play whether online or not. The content of these programs needs enrichment to reflect the nature of technology design.

- Awareness raising efforts to combat digital addiction implemented by institutions or the government in Qatar are very limited. Therefore, it is important that all ministries collaborate and work with the families on how to overcome this problem through awareness raising.

- As most practitioners reported, the most common method of preventing digital addiction is to provide parents with basic information regarding internet addiction through workshops, lectures, conferences, with an emphasis on facts about its adverse consequences.

- Referral-based service delivery has been mentioned by some practitioners as a method of service delivery.

- The practitioners highlighted several challenges in the delivery of DA services such as discontinuity of patients in treatment, workload, a shortage of staff, the need for conducting research, a lack of support for families in the treatment process, limited resources, limited awareness raising, and lack of family commitment.

CHAPTER 5: DISCUSSION AND POLICY RECOMMENDATIONS

5.1. Discussion

Daily use of internet connectivity and digital technology is an increasingly integral part of our lives. Although these tools have greatly expanded access to information and can enhance the quality of life, overuse and misuse affect health, education, and family relationships. Dependence can lead to isolation, threatens social cohesion and stability. The objectives of this study are understand the impact of excessive use of digital technologies on family relationships, and children's health (mental, psychological, and physical) and education outcomes; understand the perceptions and experiences of Qatari families, adolescent and practitioners regarding excessive use of digital technologies, in order to define and identify the problem; identify the factors that contribute to excessive use of digital technologies among children and parents; and identify coping mechanisms to deal with issues that lead to excessive use of digital technologies.

The main results from both phases showed that the issue is widespread, and that most families needed help in dealing with it. The majority of parents expressed concerns over the effects of excessive technology use on their children's health, education, and family relationships. In terms of health, both parents and adolescents mentioned headaches, physical pain, stress, anxiety, and obsession as symptoms. As far as education and family relationships are concerned, poor academic performance and a lack of concentration, along with changes in family relationships, as children are becoming more socially disconnected and less interested in family gatherings were also identified by parents and adolescents. The COVID-19 pandemic has also brought challenges to what we consider excessive and problematic use as it blended study time with family time especially at the times when student had to do remote learning.

The views of parents and children with regard to digital addiction vary. While parents emphasize behavior of their children and the need for them to comply with what they believe is good technology use, children blame their parents for being too busy, and not offering an alternative. In a recent study that we published on the topic[109], based on the parent survey, we show a correlation between parent internet addiction and adolescent internet addiction.

Parent internet addiction scores and arguments with their adolescents about technology use were positively correlated, and predicted internet addiction scores in the adolescents. This means parent internet addiction has an impact in their children, and that one can consider it a contagious behavior. Seven of the specific IA symptoms in parents were associated with the related symptoms in their adolescents. We note here that the parent survey asked parents to evaluate

their children's internet addiction using the PYDQ scale and that, ideally, each of the two populations should be asked directly. This result suggests that programs for digital parenting should not only focus on children but also on their parents' use of technology. It reiterates the commonly agreed parental behavior of playing a role model.

Through further processing of the data [110], we have identified three main behavioral patterns regarding digital parenting:

1. **Assertive interaction** consists of authoritative parents who are not addicted to internet use, with children who are at risk. These parents had occasional arguments with their adolescents.

2. **Aggressive interaction** includes authoritarian parents who are themselves at-risk in terms of IA score, and who have adolescents addicted using the PYDQ scale. These parents often had arguments with their children.

3. **Lenient interaction** includes permissive parents who are non-addicted themselves, but with children who are internet addicts.

We could not identify a group of parents who are not addicted with children also not addicted. All the clusters had children who are either addicts or at-risk. While we recognize that the survey has been conducted with parents and asked them about their children's internet behavior, it still indicates a lack of successful digital parenting.

Interview findings indicate that children have elaborated more on their reasons for the excessive use of technology, referring to underlying triggers such as difficulties of coping with school assignments and fear of being excluded by their peers, and the unengaging activities their parents offer. Parents were simplistic in the way they described the reasons, blaming peer pressure and procrastination in the first place, and acknowledging that during the pandemic, they were left with no other options. Understanding the actual experience of children with technology can be beneficial for parents to build a more engaging dialogue and a less argumentative one with their children.

The mismatch in perspectives between parents and children also occurs in the findings regarding the strategies followed by parents, and what is seen to be a useful strategy. While parents saw strategies like deprivation to be potentially successful, children had mixed views. Some thought that fear of missing out and preoccupation about the device could be much more harmful and time-wasting than leaving them on the device. In fact, salience and obsession about technology is one of the internet addiction symptoms. Detaching children from technology may trigger it, a risk that seems to be unknown to many parents.

Generally, children were more in favor of openness about technology use than parents. Still children seemed to acknowledge that a degree of coercion might be needed. Such inconsistency is typical in addictive behaviors and it also signifies that more innovative parenting styles and perhaps technology design are needed. While adolescents are aware of the harmful side of technology, they still think technology is not one thing, and that it's needed for their development and growth. The medium itself is mixed, complex, and the issues are fine-grained.

The findings indicated that discussions between parents and children remains vague. Parents discuss generic consequences of technology use, neglecting that technology overuse itself might be a symptom or consequence of underlying issues. They do not seem to recognize how an adolescent might remain constantly online and using, nor the aspects of technology that lead to immersion and facilitate a loss of control. It seems parents and children do not differentiate between the various types and modalities of use, and both seem to approach the problem in a less nuanced way. Digital literacy programs may focus on raising awareness of those immersive and, arguably, addictive, design features.

It is also interesting to note that not many children are unhappy with their technology usage (11 percent), although 17 percent thought their use is more than their peers; around 28.2 percent of them can be classified according to our used scale as addicted and 32.3 percent as at risk of being addicted. These numbers are from the survey with the children themselves. This finding raises the question of whether being seen as a "technology" addict necessarily means a child is unhappy about their use. There seems to be a discrepancy between children seeing the consequence of the behavior and the happiness about it.

Regarding the services provided to overcome 'digital addiction' in Qatar, we note the lack of specialized programs. This lack is global and not specific to Qatar. The interviews with practitioners revealed that the currently available approaches are for general behavioral issues, such as procrastination and excess play whether online or not. The material of these programs needs enrichment to reflect the nature of technology design.

Gaming use has advanced dramatically, and now uses social networking features, tournaments, and tangible and monetary rewards. Many success stories of gamers have shaped the perception of gaming, with some children being enticed toward becoming professional career online gamers. Some children have a goal of becoming online influencers. Hence, approaches to advising on excessive technology usage should be reframed in a way to reflect the profound new advances. The programs available focus on how to deal with children but neglect the role of parental obligations to play a positive role model. Our findings mentioned earlier indicated that parent internet addiction is a predictor of internet addiction in their children. Our parent survey showed that only three percent of parents are aware of available services to deal with internet addiction in children. Increasing awareness of the services is a challenge for the practitioners and health and education providers in Qatar.

5.2. Policy recommendations

Policies and practices to promote responsible use of digital technology among adolescents are essential in order to combat the growing problem of digital addiction.[111] They should consider social and cultural dynamics at the country level, as well as children's vulnerabilities and experiences, which vary among children and families. Generating national data is therefore necessary to ensure that governments and other stakeholders have access to the right information when developing these policies.

Based on the findings presented in this report, we propose the following recommendations:

General public:

- To effectively guide children's internet use, adults must have a comprehensive understanding of the use of digital technology, understanding both its risks and opportunities. This can be achieved by including sessions on the use of digital technology in parent orientation events at schools and the regular teacher-parent meetings. Annual school reports can also include information about the impact of digital technology on students.

- A dialogue based on persuasion is generally recognized by parents as the best way to deal with the problem. There is a need to educate the parents on how to effectively communicate with their adolescent child to manage their Internet use better. Again, this can be discussed in annual or quarterly meetings with parents at schools. Social workers at schools should also discuss this with parents whose children demonstrate problematic use of digital technology.

- Parents need more sophisticated parental control tools. A more innovative approach to seamlessly integrating limit-setting into devices should be considered. The Ministry of Communications and Information technology should provide links to these tools on their website with some explanation of how to activate them in Arabic so that parents are able to use them.

- Cyber-physical activities that combine technology use with physical activity can offset some of the negative health effects of technology use.

- Parents may have to be informed and educated that their own Internet use can play a role in minimizing their children's IA. Using digital wellness applications (those that track time spent on various apps) may assist parents to raise awareness about their own behavior and help with self-regulation. The Ministry of Administrative Development, Labor and Social Affairs should include this in their awareness raining campaigns targeting families in Qatar or develop dedicated campaigns for this purpose.

Educational, health, and social institutions:

- Conduct awareness-raising campaigns to teach students, parents, teachers, and healthcare providers about digital addiction. Relevant government ministries should implement digital campaigns to familiarize families and society about the potential risks of digital addiction to their children. This can be done through short videos, text messages, or other forms of digital media.

- Develop specialized digital addiction programs that meet the needs of adolescents. Digital addiction treatment is not advanced in Qatar; no official program is offered, and most addiction cases are treated through psychosocial intervention. The Ministry of Public Health can lead this effort.

- Action needs to be taken by health , education and family authorities to offer information, support, and intervention to children who experience the reported problems, and may require knowledge, and help to tackle these problems before they develop into a full-blown addiction.

- Develop robust monitoring and evaluation systems to protect and promote the wellbeing of children and adolescents with digital addiction issues. Healthcare, education, and social organizations should continue to monitor the rising rates of this condition in nationals and non-nationals to gauge the effectiveness of the current provision of services and to estimate the need for expanding the services.

- Family counseling programs shall not only focus on dealing with adolescents but help parents demonstrate constructive and balanced digital habits and become positive role models themselves.

Policymakers:

- The voices of children should be at the center of research and policy discussions on their use of the internet. Our understanding of how internet use affects children's well-being is often shaped by adult assumptions. In order to gain a nuanced and accurate understanding of online risks, we must leave assumptions behind and consult quality data generated directly through the experiences of young people.

- Develop policies to minimize online risk and maximize opportunity taking children's life contexts into account. Policies and practices must be developed and implemented in a way that considers cultural differences, social dynamics, family relationships, and support networks so that they can be effective and relevant.

Researchers and donors:

- To inform policy and practice development, high-quality comparative data should be collected regarding children's online experiences in Qatar as well as the relationships between digital addiction and the family environment. Our goal is to better understand the unique online experiences of Arab youth and to support them and their families in navigating the digital world. We require a holistic approach to this baseline research, focusing on questions related to children's access, skills, risks, and opportunities, as well as parents' and teachers' involvement and support.

- It is essential to invest in applied and clinical research for a better understanding of the potential negative effects of excessive technology use in order to develop effective interventions.

Digital media and technology companies:

- It is imperative that digital media and technology companies acknowledge and re-examine the effects of their products on the development of children and adolescents, as well as their social interactions. They are expected to act responsibly, we strongly urge them to contribute to the development of safe-use standards and to abide by a codified set of ethical guidelines.

- Governments should encourage online broadcasters, digital developers and entrepreneurs to create "age-appropriate" content that fits children's development and prevent inappropriate content from being accessible. Easy-to-use safety features that are accessible to those with basic digital literacy[112, 113] as well as new tools that help users monitor screen time and set use limits – such as those introduced by Facebook, Instagram, and Google – should be widely implemented and expanded.

CHAPTER 6: CONCLUSION, LIMITATIONS, AND FUTURE WORK

Daily digital technology use is becoming an increasingly integral part of our lives. Although information technology and internet connectivity enhance the quality of life, overdependence can lead to weakened social stability and connection. This can adversely affect family relationships, lead to alienation, isolation, and disintegration. Results of this study indicate that digital addiction is widespread, and that parents and children need help and support. Parents expressed concern about the effects of excessive technology use on their children's health, education, and family relationships. Health problems such as headaches, physical pain, stress, anxiety, and obsession were mentioned by both parents and adolescents. In terms of family relationships and education, parents and adolescents also identified poor academic performance and a lack of concentration. In addition, they identified changes in family relationships as children become more socially disconnected and less interested in family events. The COVID-19 pandemic has also brought challenges to what we consider excessive and problematic use, as students were forced to blend family time with study time. The data further showed technology overuse was also prevalent in parents, with parental addiction correlated with addiction in adolescent children, calling attention to existing family lifestyle issues. There is growing awareness for the need for persuasive and convincing approaches to helping adolescents learn the dangers of overuse, and to adopt heathy habits online.

Although the results of our study have advanced our understanding of how technology overuse impacts adolescent health, academic performance, and family relationships, several limitations of the research should be noted. First, this study is cross-sectional and used non-random sampling techniques. Therefore, generalizability of the results is limited. Second, although this study is a good steppingstone for generating hypotheses, longitudinal data are needed to advance theory and arrive at firm conclusions about how digital technology impacts children over time. Third, the study identifies how much time children spend online, but little is known about how they spend that time. We need a more detailed understanding of what they do online, why, and how they feel about it. Fourth, there is a lack of standardized measures for well-being and other related variables. Self-reported metrics, particularly IADQ and PYDQ, may impact possible recall and same-source bias. To address biases from self-reporting, future research should use objective metrics (e.g., screen time data). It is difficult to compare studies and regions in a meaningful way. In order to address the lack of comparable data on children's wellbeing, and their use of social media and the internet, and the content they view, further research and better measurement are needed. As children are using digital technologies at an ever-younger age, research on children in primary school or younger is needed.

Fifth, in assessing children's online engagement, we often rely on self-reported estimates of screen time, despite many arguing that this is an unreliable measure. Methods such as smartphone tracking are gaining traction for measuring internet use directly from a person's device[114], but it is important to consider the ethical and privacy implications of this method. Six, this study was conducted during COVID-19, when partial restrictions on social gatherings, including schools, were imposed, as well as blended learning, where students were required to attend campus classes 2-3 days a week and stay at home the rest of the time. Despite this, the impact of the pandemic on Internet use and addiction was not taken into account. As a result, future studies in this area should examine the relationship between parent and child and take into account the effect of the pandemic on parental monitoring and adolescent and parent Internet usage when parents and children are confined to the same space for an extended period of time.

Finally, in an age of digital proliferation, it appears to be very difficult for parents to determine whether certain applications or sites are appropriate for children, and whether spending time on them will have negative effects. Although spending time on Instagram can be entertaining, relying on it for self-esteem and validation can be problematic. Children may also claim that some games or applications can enhance creativity and productivity, and parents may not be able to provide a convincing response. In order to determine whether some of the claims made by sites and apps are true in reality, e.g., games which claim to boost creativity, further research is needed.

Children who grow up around digital technology are inevitably affected in how they socialize, play, learn, and seek out information. While research in this field is growing, there is still much to learn about children's internet use, particularly about the motivations behind their risky online behavior. It is important that all members of our society remain vigilant about children's use of electronic devices.

ACKNOWLEDGMENTS

The authors would like to thank and acknowledge the support of Ms. Sultana Afdhal, CEO of the World Innovation Summit for Health, Dr. Sharifa Al-Emadi, Executive Director of Doha International Family Institute, and Mr. Stavros Yiannouka, CEO of the World Innovation Summit for Education, for their dedication to this project.

We would like to extend our sincere gratitude to the following individuals for their contributions to the project:

Aisha Sultan, Researcher, Doha International Family Institute, Qatar

Ebtsam Ayoub, Executive Assistant, Doha International Family Institute, Qatar

Ekta Bansal, Head of Business Support, the World Innovation Summit for Health, Qatar

Feras Almeer, Research and Policy Development Officer, the World Innovation Summit for Health, Qatar

Hanna Mustafa, Operations Coordinator, the World Innovation Summit for Health, Qatar

Khansa Chemnad, MSc student, Hamad Bin Khalifa University, Qatar

Maryam Aziz, MSc student, Hamad Bin Khalifa University, Qatar

Sameha Ahmed Ali Al-Shakhsi, PhD candidate, Hamad Bin Khalifa University, Qatar

Warda ElKhalifa, Intern, the World Innovation Summit for Education, Qatar

The authors would like to express their appreciation to all who provided information or helped with this report in any way. We would especially like to recognize the parents, children and practitioners who participated in the surveys and interviews, and generously gave their time to provide valuable information. Last, but not least, we would like to thank all the participating schools in Qatar for hosting and facilitating our research.

The authors alone are responsible for the views expressed in this report, which do not necessarily represent the views, decisions, or policies of the institutions with which they are affiliated. Any errors or omissions remain the responsibility of the authors.

PARTNER ORGANIZATIONS



The World Innovation Summit for Health (WISH) is a global healthcare community dedicated to capturing and disseminating the best evidence-based ideas and practices. WISH is an initiative of Qatar Foundation for Education, Science and Community Development (QF) and is under the patronage of Her Highness Sheikha Moza bint Nasser, its Chairperson. The inaugural WISH Summit took place in Doha in 2013 and convened more than 1,000 global healthcare leaders. Through international summits and a range of ongoing initiatives, WISH is creating a global community of leading Innovators in healthcare policy, research, and industry. Together, they are harnessing the power of innovation to overcome the world's most urgent healthcare challenges and inspire other stakeholders to action.



WISE was established by Qatar Foundation in 2009 under the leadership of its Chairperson, Her Highness Sheikha Moza bint Nasser. WISE is an international, multi-sectoral platform for creative, evidence-based thinking, debate, and purposeful action toward building the future of education. Through the biennial summit, collaborative research and a range of on-going programs, WISE is a global reference in new approaches to education. The WISE Research series, produced in collaboration with experts from around the world, addresses key education issues that are globally relevant and reflect the priorities of the Qatar National Research Strategy. Presenting the latest knowledge, these comprehensive reports examine a range of education challenges faced in diverse contexts around the globe, offering action-oriented recommendations and policy guidance for all education stakeholders. Past WISE Research publications have addressed issues of access, quality, financing, teacher training, school systems leadership, education in conflict areas, entrepreneurship, early-childhood education, and twenty-first century skills.

DIFI
معهد الدوحة الدولي للأسرة
Doha International Family Institute
البحوث لدعم السياسات الأسرية
Research to advance family policies
Member of Qatar Foundation عضو في مؤسسة قطر

The Doha International Family Institute (DIFI), a member of Qatar Foundation for Education, Science and Community Development (QF), was established in 2006. The Institute works to strengthen the family through the development and dissemination of high-quality research on Arab families, encouraging knowledge exchange on issues relevant to the family and making the family a priority to policy-makers through advocacy and outreach at the national, regional and international levels. Among the Institute's most important initiatives is the Annual Conference on the Family; and the OSRA Research Grant in collaboration with the Qatar National Research Fund, an annual research grant which encourages research related to the Arab family and family policy. The Institute has special consultative status with United Nations Economic and Social Council.

جامعة حمد بن خليفة
HAMAD BIN KHALIFA UNIVERSITY
عضو في مؤسسة قطر
Member of Qatar Foundation

Hamad Bin Khalifa University, a member of Qatar Foundation, was founded in 2010 as a research-intensive university that acts as a catalyst for transformative change in Qatar and the region while having global impact. Located within Education City, HBKU seeks to provide unparalleled opportunities where inquiry and discovery are integral to teaching and learning at all levels utilizing a multidisciplinary approach across all focus areas. HBKU is committed to actively contribute to achieving the Qatar National Vision 2030 by building and cultivating human capacity through an enriching academic experience and an innovative research ecosystem. Through applying creativity to knowledge, students will have the opportunity to discover innovative solutions that are locally relevant and have a global impact.

REFERENCES

1. Block JJ. Issues for DSM-V: internet addiction. American Journal of Psychiatry. 2008 Mar;165(3):306-7.

2. Basel A Mohamed, McAlaney J, Skinner T, Pleva M, Ali R. Defining digital addiction: Key features from the literature. Psihologija [internet]. 2020;53(3):237–53. Available from: http://dx.doi.org/10.2298/psi191029017a

3. Cheng C, Li AY. internet addiction prevalence and quality of (real) life: a meta analysis of 31 nations across seven world regions. Cyberpsychology, Behavior, and Social Networking [internet]. 2014;17(12):755–60. Available from: https://www.liebertpub.com/doi/10.1089/cyber.2014.0317

4. Kaptsis D, King DL, Delfabbro PH, Gradisar M. Withdrawal symptoms in internet gaming disorder: A systematic review. Clin Psychol Rev [internet]. 2016;43:58–66. Available from: http://dx.doi.org/10.1016/j.cpr.2015.11.006

5. ICD-11 for mortality and morbidity statistics [internet]. Who.int. [cited 2022 Sep 8]. Available from: https://icd.who.int/browse11/l-m/en

6. UNICEF. The state of the world's children 2011: Adolescence: An age of opportunity. New York, NY: UNICEF; 2011.

7. Dehmler K. Adolescent technology usage during sleep-time: does it influence their quality of sleep, attention difficulties and academic performance? In: Thesis Rochester Institute of Technology. 2009.

8. Pane F, Steiner E, Baird M, Hamilton L, Pane J. Informing Progress: Insights on Personalized Learning Implementation and Effects. Santa Monica, Calif: RAND Corporation; 2017.

9. Alhumaid K. Four ways technology has negatively changed education. J Educ Soc Res [internet]. 2019;9(4):10–20. Available from: http://dx.doi.org/10.2478/jesr-2019-0049

10. Bryant J, Child F, Dorn E, Hall S. New global data reveal education technology's impact on learning [internet]. Mckinsey.com. McKinsey & Company; 2020 [cited 2022 Sep 9]. Available from: https://www.mckinsey.com/industries/education/our-insights/new-global-data-reveal-education-technologys-impact-on-learning

11. Simuforosa M. The Impact of Modern Technology on the Educational Attainment of Adolescent. International Journal of Education and Research. 2013;(9).

12. Johansson AEE, Petrisko MA, Chasens ER. Adolescent sleep and the impact of technology use before sleep on daytime function. J Pediatr Nurs [internet]. 2016;31(5):498–504. Available from: http://dx.doi.org/10.1016/j.pedn.2016.04.004

13. Owusu-Marfo J. The Impact of the Use of Smart Mobile Devices on Sleep Quality among Health Trainees at College of Health and Well-Being, Kintampo-Ghana. Kwame Nkrumah University of Science and Technology ; 2016.

14. Hillman T. Finding space for student innovative practices with technology in the classroom. Learn Media Technol [internet]. 2014;39(2):169–83. Available from: http://dx.doi.org/10.1080/17439884.2013.803256

15. D'Angelo C. The impact of technology: Student engagement and success. In: Technology and the Curriculum: Summer 2018. Power Learning Solutions; 2018.

16. Kirkscey R. Secondary school instructors' perspectives on the integration of information and communication technologies (ICT) with course content. American Secondary Education. 2012;17–33.

17. Miller JP, Milholland ES, Gould SM. Determining the attitudes of students toward the use of a classroom response in hospitality courses. J hosp tour educ [internet]. 2012;24(2–3):73–9. Available from: http://dx.doi.org/10.1080/10963758.2012.10696673

18. Schindler LA, Burkholder GJ, Morad OA, Marsh C. Computer-based technology and student engagement: a critical review of the literature. Int J Educ Technol High Educ [internet]. 2017;14(1). Available from: http://dx.doi.org/10.1186/s41239-017-0063-0

19. Banitt J, Theis S, Van Leeuwe L. The Effects of Technology Integration on Student Engagement. (Dissertation). St. Paul, Minnesota. St. Catherine University; 2013 [internet]. [St. Paul, Minnesota.]: St. Catherine University. ; 2013. Available from: https://sophia.stkate.edu/maed/7/

20. Torres-Díaz J-C, Duart J-M, Gómez-Alvarado H-F, Marín-Gutiérrez I, Segarra-Faggioni V. internet use and academic success in university students. Comunicar [internet]. 2016 [cited 2022 Sep 9];24(48):61–70. Available from: https://www.academia.edu/27265756/%20internet_Use_and_Academic_Success_in_University_Students

21. Jehopio P, Wesonga R, Candia D. internet Heavy usage and its influence on Academia Achievement of University Students. 2017.

22. Carle AC, Jaffee D, Miller D. Engaging college science students and changing academic achievement with technology: A quasi experimental preliminary investigation. Computers & Education. 2009;52(2):376–80.

23. Wartella E, Rideout V, Lauricella AR, Connell S. Parenting in the age of digital technology. Report for the center on media and Human development school of communication Northwestern University. 2013 Jun.

24. Nikken P, De Haan J. Guiding young children's internet use at home: Problems that parents experience in their parental mediation and the need for parenting support. Cyberpsychology (Brno) [internet]. 2015 [cited 2022 Sep 9];9(1). Available from: https://cyberpsychology.eu/article/view/4327/3384

25. Takeuchi L. Families matter: Designing media for a digital age. In: The Joan Ganz Cooney Center at Sesame Workshop. New York, NY; 2011.

26. İnan-Kaya G, Mutlu-Bayraktar D, Yilmaz Ö. Digital Parenting: Perceptions on Digital Risks. Kalem Uluslararasi Egitim ve Insan Bilimleri Dergisi. 2018.

27. Livingstone S, Helsper EJ. Parental mediation of children's internet use. J Broadcast Electron Media [internet]. 2008;52(4):581–99. Available from: http://dx.doi.org/10.1080/08838150802437396

28. Mutimmatul F, Wibawa SC, Ekawati R. Digital Addiction in Indonesian Adolescent. In: Proceedings of the Mathematics, Informatics, Science, and Education International Conference (MISEIC 2018). Paris, France: Atlantis Press; 2018.

29. Beyens I, Beullens K. Parent–child conflict about children's tablet use: The role of parental mediation. New Media Soc [internet]. 2017;19(12):2075–93. Available from: http://dx.doi.org/10.1177/1461444816655099

30. Wu CST, Wong HT, Yu KF, Fok KW, Yeung SM, Lam CH, et al. Parenting approaches, family functionality, and internet addiction among Hong Kong adolescents. BMC Pediatr [internet]. 2016;16(1). Available from: http://dx.doi.org/10.1186/s12887-016-0666-y

31. Livingstone S, Mascheroni G, Dreier M, Chaudron S, Lagae K. How parents of young children manage digital devices at home: The role of income, education and parental style. London; 2015.

32. Knitter B, Zemp M. Digital family life: A systematic review of the impact of parental smartphone use on parent-child interactions: A systematic review about the impact of parental smartphone use on parent-child interactions. Digit Psych [internet]. 2020;1(1):29–43. Available from: http://dx.doi.org/10.24989/dp.v1i1.1809

33. Huang S, Hu Y, Ni Q, Qin Y, Lü W. Parent-children relationship and internet addiction of adolescents: The mediating role of self-concept. Curr Psychol [internet]. 2021;40(5):2510–7. Available from: http://dx.doi.org/10.1007/s12144-019-00199-9

34. Deng L, Fang X, Yan J. The relationship between interparental relationship, parent-child relationship and adolescents' internet addiction. Chinese Journal of Special Education. 2013;9:71–7.

35. Liu Q-X, Fang X-Y, Zhou Z-K, Zhang J-T, Deng L-Y. Perceived parent-adolescent relationship, perceived parental online behaviors and pathological internet use among adolescents: gender-specific differences. PLoS One [internet]. 2013;8(9):e75642. Available from: http://dx.doi.org/10.1371/journal.pone.0075642

36. Zhang J, Liu Q, Deng Y, Fang X, Liu Z, Lan J. Parents-adolescents' relations and adolescent's internet addiction: The mediation effect of loneliness. Psychological Development and Education (Chinese Journal). 2011;6:641–7.

37. Zhu J, Zhang W, Yu C, Bao Z. Early adolescent internet game addiction in context: How parents, school, and peers impact youth. Comput Human Behav [internet]. 2015;50:159–68. Available from: http://dx.doi.org/10.1016/j.chb.2015.03.079

38. Yen J-Y, Yen C-F, Chen C-C, Chen S-H, Ko C-H. Family factors of internet addiction and substance use experience in Taiwanese adolescents. Cyberpsychol Behav [internet]. 2007;10(3):323–9. Available from: http://dx.doi.org/10.1089/cpb.2006.9948

39. Keya FD, Rahman MM, Nur MT, Pasa MK. Parenting and child's (five years to eighteen years) digital game addiction: A qualitative study in North-Western part of Bangladesh. Computers in Human Behavior Reports [internet]. 2020;2(100031):100031. Available from: http://dx.doi.org/10.1016/j.chbr.2020.100031

40. Loton D. Video Game Addiction and Engagement in Adult Gamers: Differentiation Based on Relationships with Health and Functioning (Doctoral dissertation). Victoria University;

41. Hazar Z. An analysis of the relationship between digital game playing motivation and digital game addiction among children. Asian J Educ Train [internet]. 2018;5(1):31–8. Available from: http://dx.doi.org/10.20448/journal.522.2019.51.31.38

42. Oskenbay F, Tolegenova A, Kalymbetova E, Chung MC, Faizullina A, Jakupov M. Psychological trauma as a reason for computer game addiction among adolescents. International Journal of Environmental and Science Education. 2016;11(9):2343–53.

43. Anandari DR. Permissive parenting style and its risks to trigger online game addiction among children. In: Asian Conference 2nd Psychology & Humanity. 2016. p. 773–81.

44. Hasebrink U, Livingstone S, Haddon L, Olafsson K. Comparing children's online opportunities and risks across Europe: Cross-national comparisons for EU childrenOnline. EU childrenOnline. 2009;

45. Vitalari NE, Venkatesh A, Gronhaug K. Computing in the home: Shifts in the time allocation patterns of households. Communications of the ACM. 1985;28:512–22.

46. Sproull L, Kiesler S, Kiesler SB. Connections: new ways of working in the networked organization. Cambridge, Mass: MIT Press; 1992.

47. Nie NH. The impact of internet use on sociability: Time diary findings. IT & Society. 2002;1:1–20.

48. Kiesler S. Culture of the internet. New York, New York: Psychology Press; 2014.

49. Gunuc S, Dogan A. The relationships between Turkish adolescents' internet addiction, their perceived social support and family activities. Comput Human Behav [internet]. 2013;29(6):2197–207. Available from: http://dx.doi.org/10.1016/j.chb.2013.04.011

50. Clark LS. The parent app: Understanding families in the digital age. Oxford: Oxford University Press; 2013.

51. Kirwil L. Parental mediation of children's internet use in different European countries. J Child Media [internet]. 2009;3(4):394–409. Available from: http://dx.doi.org/10.1080/17482790903233440

52. Livingstone S, Haddon L, Görzig A, Ólafsson K. Risks and safety on the internet: The perspective of European children. Full FindingsLSE. 2011;

53. Livingstone S, Hasebrink U, Görzig A. Towards a general model of determinants of risks and safety. In: Livingstone S, Haddon L, Görzig A, editors. Children, risk and safety on the internet. Bristol: Policy Press; 2012. p. 323–39.

54. Chaudron S, Beutel ME, Černikova M, Donoso Navarette V, Dreier M, Fletcher-Watson B, et al. Young children (0–8) and digital technology: A qualitative exploratory study across seven countries. JRC. 2015;

55. Valcke M, Bonte S, De Wever B, Rots I. internet parenting styles and the impact on internet use of primary school children. Comput Educ [internet]. 2010;55(2):454–64. Available from: http://dx.doi.org/10.1016/j.compedu.2010.02.009

56. Nikken P, Schols M. How and why parents' guide the media use of young children. ' Journal of Child and Family Studies. 2015;5–8.

57. Nathanson AI. The unintended effects of parental mediation of television on adolescents. Media Psychol [internet]. 2002;4(3):207–30. Available from: http://dx.doi.org/10.1207/s1532785xmep0403_01

58. Alqahtani N, Furnell S, Atkinson S, Stengel I. internet risks for children: Parents' perceptions and attitudes: An investigative study of the Saudi Context. In: 2017 internet Technologies and Applications (ITA). IEEE; 2017.

59. Kessler RC, Berglund P, Demler O, Jin R, Merikangas KR, Walters EE. Lifetime prevalence and age-of-onset distributions of DSM-IV disorders in the National Comorbidity Survey Replication. Arch Gen Psychiatry [internet]. 2005;62(6):593–602. Available from: http://dx.doi.org/10.1001/archpsyc.62.6.593

60. Ash J, Burnett B, Federico S, Harris P, Keller M. Young Minds Matter: Supporting Children's Mental Health Through Policy Change. 81. The Colorado Children's Campaign [internet]. Childrenscolorado.org. [cited 2022 Sep 9]. Available from: https://www.childrenscolorado.org/globalassets/community/childrens-mental-health-policy-paper.pdf

61. Children & Young People's Mental Health in the Digital Age - Shaping the Future - OECD [internet]. Readkong.com. [cited 2022 Sep 9]. Available from: https://www.readkong.com/page/children-young-people-s-mental-health-in-the-digital-age-8880731

62. UNICEF. The state of the world's children 2017: Children in a digital world. New York, NY: UNICEF; 2018.

63. Kim JH, Lau CH, Cheuk K-K, Kan P, Hui HLC, Griffiths SM. Brief report: Predictors of heavy internet use and associations with health-promoting and health risk behaviors among Hong Kong university students. J Adolesc [internet]. 2010;33(1):215–20. Available from: http://dx.doi.org/10.1016/j.adolescence.2009.03.012

64. Sisson SB, Broyles ST, Baker BL, Katzmarzyk PT. Screen time, physical activity, and overweight in U.S. youth: national survey of children's health 2003. J Adolesc Health [internet]. 2010;47(3):309–11. Available from: http://dx.doi.org/10.1016/j.jadohealth.2010.02.016

65. Vidyachathoth KB, Kumar NA, Pai SR. Correlation between affect and internet addiction in undergraduate medical students in Mangalore. Journal of Addiction Research & Therapy. 2014;5(1):1–4.

66. Rotsztein B. Problem internet use and locus of control among college students: Preliminary findings. In35th annual conference of the New England educational research organization 2003 Apr 10 (pp. 1-13).

67. Kagan K. Self-esteem, daily internet use and social media addiction as predictors of depression among Turkish adolescents. Journal of Education & Practice. 2016;1(24):64–72.

68. Ko CH, Yen JY, Yen CF, Chen CS, Chen CC. The association between IA and psychiatric disorder: A review of the literature. European Psychiatry. 2012;27:1–8.

69. Weinstein A, Yaacov Y, Manning M, Danon P, Weizman A. internet addiction and Attention Deficit Hyperactivity Disorder (ADHD) among school children. Israeli Medical Association Journal. 2015;17(12):731–4.

70. Mohamed G, Bernouss R. A cross-sectional study on internet addiction among Moroccan high school students, its prevalence and association with poor scholastic performance. Int J Adolesc Youth [internet]. 2020;25(1):479–90. Available from: https://www.tandfonline.com/doi/full/10.1080/02673843.2019.1674165

71. Morrison CM, Gore H. The relationship between excessive internet use and depression: a questionnaire-based study of 1,319 young people and adults. Psychopathology [internet]. 2010;43(2):121–6. Available from: http://dx.doi.org/10.1159/000277001

72. Young K. Caught in the net: How to recognize the signs of internet addiction and a winning strategy for recovery. New York: Wiley; 1998.

73. LaRose R, Lin CA, Eastin MS. Unregulated internet usage: Addiction, habit, or deficient self-regulation? Media Psychol [internet]. 2003;5(3):225–53. Available from: http://dx.doi.org/10.1207/s1532785xmep0503_01

74. Kim J, Larose R, Peng W. Loneliness as the cause and the effect of problematic internet use: The relationship between internet use and psychological well-being. Cyber Psychology Behavior: The Impact of the internet. Cyber Psychology Behavior: The Impact of the internet. 2009;12:451–5.

75. Hökby S, Hadlaczky G, Westerlund J, Wasserman D, Balazs J, Germanavicius A, et al. Are mental health effects of internet use attributable to the Web-based content or perceived consequences of usage? A longitudinal study of European adolescents. JMIR Ment Health [internet]. 2016;3(3):e31. Available from: http://dx.doi.org/10.2196/mental.5925

76. van der Schuur WA, Baumgartner SE, Sumter SR. Social media use, social media stress, and sleep: Examining cross-sectional and longitudinal relationships in adolescents. Health Commun [internet]. 2019;34(5):552–9. Available from: https://www.tandfonline.com/doi/full/10.1080/10410236.2017.1422101

77. Jacob N, Evans R, Scourfield J. The influence of online images on self-harm: A qualitative study of young people aged 16-24. J Adolesc [internet]. 2017;60:140–7. Available from: http://dx.doi.org/10.1016/j.adolescence.2017.08.001

78. Abdrbo AA, Hassanein S. Effect of internet use for health information and internet addiction on adolescents female high school' health lifestyle. J Nurs Educ Pract [internet]. 2017;7(12):10. Available from: http://dx.doi.org/10.5430/jnep.v7n12p10

79. Malak MZ, Khalifeh AH, Shuhaiber AH. Prevalence of internet Addiction and associated risk factors in Jordanian school students. Comput Human Behav [internet]. 2017;70:556–63. Available from: http://dx.doi.org/10.1016/j.chb.2017.01.011

80. Khalil AI, Alharbi NB, Alhawasawi HY, Albander AB. Prevalence of internet addiction among nursing students and the association with their academic performance and mental health. Athens Journal of Health. 2016;3(4):291–306.

81. Al-Hantoushi M. internet addiction among secondary school students in Riyadh city, its prevalence, correlates and relation to depression: A questionnaire survey. Int J Med Sci Public Health. 2014;3(1):10–5.

82. Nafee HM, Mohammed BA, Al-Hamdan AY. Effect of excessive internet use in Saudi and Egyptian teenagers' health: Comparative study. J Nurs Educ Pract [internet]. 2018;8(9):25. Available from: http://dx.doi.org/10.5430/jnep.v8n9p25

83. El Gazzar N. Adolescents' perception and Attitudes Towards Social Media Networks in Egypt. The Scientific Journal of Radio and TV Research, 5, 1-26.

84. Reda M, Rabie M, Mohsen N, Hassan A. Problematic internet users and psychiatric morbidity in a sample of Egyptian adolescents. Psychology (Irvine) [internet]. 2012;03(08):626–31. Available from: http://dx.doi.org/10.4236/psych.2012.38096

85. Abbey G, Walter B, Frank I. Mobile phone use and sleep quality and length in college students. Int. j. humanit. soc. sci.. 2010;1(18):203–22.

86. Hussain H, Ahmed N, Hamid M, Tuffaha M, Aguilar K. Social Media, internet and Electronic Devices Addiction among Children and Adolescents in Global contexts modern cities. Journal of Psychiatry Research Reviews & Reports. 2019;2(1):1–5.

87. Schoenbach K, Khaled SM, Wartella EA, Saeed M. Health information and monitoring among Qatari adolescents 2017: An overview. In: Qatar Foundation Annual Research Conference Proceedings Volume 2018 Issue 4. Hamad bin Khalifa University Press (HBKU Press); 2018.

88. Bener A, Al-Mahdi HS, Vachhani PJ, Al-Nufal M, Ali AI. Do excessive internet use, television viewing and poor lifestyle habits affect low vision in school children? J Child Health Care [internet]. 2010;14(4):375–85. Available from: https://journals.sagepub.com/doi/10.1177/1367493510380081

89. Bélanger RE, Akre C, Berchtold A, Michaud P-A. A U-shaped association between intensity of internet use and adolescent health. Pediatrics [internet]. 2011;127(2):e330-5. Available from: http://dx.doi.org/10.1542/peds.2010-1235

90. Punamäki R-L, Wallenius M, Nygård C-H, Saarni L, Rimpelä A. Use of information and communication technology (ICT) and perceived health in adolescence: the role of sleeping habits and waking-time tiredness. J Adolesc [internet]. 2007;30(4):569–85. Available from: http://dx.doi.org/10.1016/j.adolescence.2006.07.004

91. Suris J-C, Akre C, Piguet C, Ambresin A-E, Zimmermann G, Berchtold A. Is internet use unhealthy? A cross-sectional study of adolescent internet overuse. Swiss Med Wkly [internet]. 2014;144:w14061. Available from: http://dx.doi.org/10.4414/smw.2014.14061

92. Kamer GÜ, Fn Ş. internet addiction in Turkish adolescents and their postponed activities of daily living. Kocaeli Üniversitesi Sağlık Bilimleri Dergisi. 2016;2:32–8.

93. Saueressig IB, Oliveira VMA de, Xavier MKA, Santos LRA dos, Silva KMA, Araújo RC de. Prevalence of musculoskeletal pain in adolescents and its association with the use of electronic devices. Rev Dor [internet]. 2015;16(2). Available from: https://www.scielo.br/j/rdor/a/hGqBX6sJJ9S49LJ3p7jPBPw/?lang=pt

94. Bener A, Bhugra D. Lifestyle and depressive risk factors associated with problematic internet use in adolescents in an Arabian gulf culture. J Addict Med [internet]. 2013;7(4):236–42. Available from: http://dx.doi.org/10.1097/adm.0b013e3182926b1f

95. Elizabeth CM. Relation of Adolescent Video Game Play to Time Spent in Other Activities. Archives of Pediatrics & Adolescent Medicine. 2007;161:684–9.

96. Gebremariam MK, Bergh IH, Andersen LF, Ommundsen Y, Totland TH, Bjelland M, et al. Are screen-based sedentary behaviors longitudinally associated with dietary behaviors and leisure-time physical activity in the transition into adolescence? Int J Behav Nutr Phys Act [internet]. 2013;10(1):9. Available from: http://dx.doi.org/10.1186/1479-5868-10-9

97. Spada MM. An overview of problematic internet use. Addict Behav [internet]. 2014;39(1):3–6. Available from: https://www.sciencedirect.com/science/article/abs/pii/S0306460313002669?via%3Dihub

98. Young KS. internet addiction: The emergence of a new clinical disorder. Cyberpsychol Behav [internet]. 1998;1(3):237–44. Available from: http://dx.doi.org/10.1089/cpb.1998.1.237

99. Wartberg L, Kriston L, Kegel K, Thomasius R. Adaptation and psychometric evaluation of the Young Diagnostic Questionnaire (YDQ) for parental assessment of adolescent problematic internet use. J Behav Addict [internet]. 2016;5(2):311–7. Available from: http://dx.doi.org/10.1556/2006.5.2016.049

100. Strauss A, Corbin J. Basics of Qualitative Research: Techniques and Procedures for Developing Grounded Theory. Thousand Oaks, CA: Sage Publications, Inc; 1998.

101. Creswell JW. Research design: Qualitative, quantitative, and mixed methods approaches. Thousand Oaks, CA: Sage; 2003.

102. Young KS, De Abreu CN. internet Addiction: A Handbook and Guide to Evaluation and Treatment. Hoboken: John Wiley; 2010.

103. Durkee T, Kaess M, Carli V, Parzer P, Wasserman C, Floderus B, et al. Prevalence of pathological internet use among adolescents in Europe: demographic and social factors: Pathological internet use among adolescents. Addiction [internet]. 2012;107(12):2210–22. Available from: http://dx.doi.org/10.1111/j.1360-0443.2012.03946.x

104. Beard KW, Wolf EM. Modification in the proposed diagnostic criteria for internet addiction. Cyberpsychol Behav [internet]. 2001;4(3):377–83. Available from: http://dx.doi.org/10.1089/109493101300210286

105. Chalder T, Berelowitz G, Pawlikowska T, Watts L, Wessely S, Wright D, et al. Development of a fatigue scale. J Psychosom Res [Internet]. 1993;37(2):147–53. Available from: http://dx.doi.org/10.1016/0022-3999(93)90081-p

106. Brown TA, Chorpita BF, Korotitsch W, Barlow DH. Psychometric properties of the Depression Anxiety Stress Scales (DASS) in clinical samples. Behav Res Ther [Internet]. 1997;35(1):79–89. Available from: http://dx.doi.org/10.1016/s0005-7967(96)00068-x

107. Fok CCT, Allen J, Henry D, People Awakening Team. The brief family relationship scale: a brief measure of the relationship dimension in family functioning: A brief measure of the relationship dimension in family functioning. Assessment [Internet]. 2014;21(1):67–72. Available from: http://dx.doi.org/10.1177/1073191111425856

108. Moor I, Winter K, Bilz L, Bucksch J, Finne E, John N, et al. The 2017/18 Health Behaviour in School-aged Children (HBSC) study-Methodology of the World Health Organization's child and adolescent health study. Journal of Health Monitoring. 2020;5(3).

109. Chemnad K, Alshakhsi S, Al-Harahsheh S, Abdelmoneium AO, Al-Khalaf MS, Baghdady A, et al. Is it contagious? Does parents' internet addiction impact their adolescents' internet addiction? Soc Sci Comput Rev [internet]. 2022;089443932211174. Available from: http://dx.doi.org/10.1177/08944393221117408

110. Aziz M, Erbad A, Brahim Belhaouari S, Abdelmoneium AO, Al-Harahsheh S, Bagdady A, et al. The interplay between adolescents' internet addiction and family-related factors: three common patterns. Int J Adolesc Youth [internet]. 2022;27(1):418–31. Available from: http://dx.doi.org/10.1080/02673843.2022.2115307

111. Gottschalk F. Impacts of technology use on children: Exploring literature on the brain, cognition and well-being. Paris, France: OECD Publishing; 2019.

112. King D. Policy and Prevention Approaches for Disordered and Hazardous Gaming and internet Use: an International Perspective". Prevention Science. 2018;233–49.

113. New technologies and 21st century children: Recent trends and outcomes. Organisation for Economic Co-Operation and Development (OECD); 2018

114. Lind MN, Byrne ML, Wicks G, Smidt AM, Allen NB. The Effortless Assessment of Risk States (EARS) tool: An interpersonal approach to mobile sensing. JMIR Ment Health [internet]. 2018;5(3):e10334. Available from: http://dx.doi.org/10.2196/10334

APPENDICES

APPENDIX.1 DEMOGRAPHIC INFORMATION ON PARENTS AND CHILDREN

Table 1: Socio-demographic information on parents

Variable	percent
Age	**Mean = (41.82 years)**
Gender	
Female	32.8 percent
Male	66.9 percent
Nationality	
Non-Qatari	64 percent
Qatari	36 percent
Ethnicity	
Arabs	67.82 percent
Eastern	15.52 percent
Western	16.67 percent
Marital status	
Divorced	4.02 percent
I prefer not to say	0.57 percent
Married	94.25 percent
Widowed	1.15 percent
Employment status of parents who fill out the survey	
Employed	76.44 percent
Unemployed	23.56 percent
Spouse 'employment status	
Employed	74.14 percent
Unemployed	25.86 percent
How well-off is the family?	
Not at all well off	2.89 percent
Not so well off	23.12 percent

Average	42.20 percent
Quite well off	26.01 percent
Very well off	5.78 percent
Family Income	
Less than 10,000 QR	5.20 percent
10,000 - 29,999 QR	30.64 percent
30,000 - 49,999 QR	29.48 percent
50,000 - 69,999 QR	13.87 percent
70,000 - 89.999 QR	6.94 percent
90,000 and more QR	13.87 percent
Education level	
Less than High School	0.57 percent
High School graduate	5.75 percent
Associate College degree (2 years)	1.72 percent
Bachelor college degree (4 years)	47.70 percent
Graduate degree, e.g., Masters or Doctorate	44.25 percent
Spouse 'level of education	
Less than High School	2.87 percent
High School graduate	9.77 percent
Associate College degree (2 years)	8.05 percent
Bachelor college degree (4 years	46.55 percent
Graduate degree, e.g., Masters or Doctorate	32.76 percent
Number of children at home	
1	5 percent
2	26 percent
3	21 percent
4	24 percent
5	16 percent
6	5 percent

7	3 percent
10	1 percent
Number of adolescent children at home	
1	42.53 percent
2	37.36 percent
3	17.24 percent
4	1.72 percent
5	1.15 percent

Table 5: Socio-demographic information on children

Variable	percent
Age	**Mean = (13 years)**
Gender	
Female	80.2 percent
Male	19.8 percent
Nationality	
Non-Qatari	70.6 percent
Qatari	29.4 percent
Ethnicity	
Arabs	75.4 percent
Eastern	16.9 percent
Western	6.7 percent
Father's employment status	
Employed	95.6 percent
Unemployed	4.4 percent
Mother's employment status	
Employed	54.6 percent
Unemployed	45.4 percent
How well-off is the family?	

Not at all well off	.7 percent
Not so well off	1.9 percent
Average	19.8 percent
Quite well off	32.6 percent
Very well off	45.1 percent
Father's level of education	
Less than High School	8.5 percent
High School graduate	20.8 percent
Associate College degree (2 years)	9.9 percent
Bachelor college degree (4 years)	29.5 percent
Graduate degree, e.g., Masters or Doctorate	22.7 percent
Other	8.5 percent
Mother's level of education	
Less than High School	10.2 percent
High School graduate	22.0 percent
Associate College degree (2 years)	12.6 percent
Bachelor college degree (4 years	32.1 percent
Graduate degree, e.g., Masters or Doctorate	16.0 percent
Type of school	
Private	32.4 percent
Public	65.0 percent
Academic performance	
Average	.9 percent
Below Average	11.7 percent
Good	34.5 percent
Very Good	53.0 percent

APPENDIX.2 INTERNET ADDICTION TESTS

1. Young – Internet Addiction Diagnostic Questionnaire (IAT) from parents' perspective

- **Q1 Parent**: Do you feel preoccupied with the internet (think about previous online activity or anticipate next online session)?
- **Q2 Parent:** Do you feel the need to use the internet with increasing amounts of time in order to achieve satisfaction?
- **Q3 Parent:** Have you repeatedly made unsuccessful efforts to control, cut back, or stop internet use?
- **Q4 Parent:** Do you feel restless, moody, depressed, or irritable when attempting to cut down or stop internet use?
- **Q5 Parent:** Do you stay online longer than originally intended?
- **Q6 Parent:** Have you jeopardized or risked the loss of significant relationship, job, educational or career opportunity because of the internet?
- **Q7 Parent:** Have you lied to family members, therapists, or others to conceal the extent of involvement with the internet?
- **Q8 Parent:** Do you use the internet as a way of escaping problems or of relieving a dysphoric mood (e.g., feelings of helplessness, guilt, anxiety, depression)?

2.Parental version of the Young Diagnostic Questionnaire (PYDQ)

- **Q1 Child:** Does your child feel preoccupied with the internet (think about a previous online activity or anticipate the next online session)?
- **Q2 Child:** Does your child feel the need to use the internet with increasing amounts of time in order to achieve satisfaction?
- **Q3 Child:** Has your child repeatedly made unsuccessful efforts to control, cut back, or stop internet use?
- **Q4 Child:** Does your child feel restless, moody, depressed, or irritable when attempting to cut down or stop internet use?

- **Q5 Child:** Does your child stay online longer than originally intended?

- **Q6 Child:** Has your child jeopardized or risked the loss of a significant relationship, job, educational, or career opportunity because of the internet?

- **Q7 Child:** Has your child lied to family members, a therapist, or others to conceal the extent of involvement with the internet?

- **Q8 Child:** Does your child use the internet as a way of escaping from problems or of relieving a dysphoric mood (e.g., feelings of helplessness, guilt, anxiety, depression)?

3. Internet Addiction Diagnostic Questionnaire (IAT) form children's perspective

- **Q1 Child:** Do you feel preoccupied with the internet (think about previous online activity or anticipate next online session)?

- **Q2 Child:** Do you feel the need to use the internet with increasing amounts of time in order to achieve satisfaction?

- **Q3 Child:** Have you repeatedly made unsuccessful efforts to control, cut back, or stop internet use?

- **Q4 Child:** Do you feel restless, moody, depressed, or irritable when attempting to cut down or stop internet use?

- **Q5 Child:** Do you stay online longer than originally intended?

- **Q6 Child:** Have you jeopardized or risked the loss of significant relationship, job, educational or career opportunity because of the internet?

- **Q7 Child:** Have you lied to family members, therapist, or others to conceal the extent of involvement with the internet?

- **Q8 Child:** Do you use the internet as a way of escaping from problems or of relieving a dysphoric mood (e.g., feelings of helplessness, guilt, anxiety, depression)?

APPENDIX 3: BIVARIATE ANALYSIS (CORRELATION ANALYSIS)

Table 10. Pearson's Correlations between internet addiction (IA) in children and Health

Variable		1	2	3	4	5	6
1. IA	Pearson's r	—					
	p-value	—					
2. Stress	Pearson's r	0.482 ***	—				
	p-value	< .001	—				
3. Anxiety	Pearson's r	0.403 ***	0.790 ***	—			
	p-value	< .001	< .001	—			
4. Depression	Pearson's r	0.463 ***	0.816 ***	0.720 ***	—		
	p-value	< .001	< .001	< .001	—		
5. FSPhysical	Pearson's r	0.451 ***	0.699 ***	0.657 ***	0.669 ***	—	
	p-value	< .001	< .001	< .001	< .001	—	
6. FSMental	Pearson's r	0.434 ***	0.693 ***	0.644 ***	0.640 ***	0.784 ***	—
	p-value	< .001	< .001	< .001	< .001	< .001	—

* p < .05, ** p < .01, *** p < .001

Table 11. Pearson's correlation between internet addiction in children (IA) and parents' monitoring of children's online time and activities as well as family relationships

Variable		1	2	3	4	5	6
1. Total_IA	Pearson's r	—					
	p-value	—					
2. Parents_observe_time	Pearson's r	-0.230 ***	—				
	p-value	< .001	—				
3. Parents_observe_activities	Pearson's r	-0.299 ***	0.607 ***	—			
	p-value	< .001	< .001	—			
4. Cohesion	Pearson's r	-0.303 ***	0.199 ***	0.207 ***	—		
	p-value	< .001	< .001	< .001	—		
5. Conflict_Free	Pearson's r	-0.339 ***	0.188 ***	0.227 ***	0.507 ***	—	
	p-value	< .001	< .001	< .001	< .001	—	
6. Expressiveness	Pearson's r	-0.293 ***	0.263 ***	0.254 ***	0.663 ***	0.393 ***	—
	p-value	< .001	< .001	< .001	< .001	< .001	—

* p < .05, ** p < .01, *** p < .001

Table 12. Pearson's correlation between internet addiction in children (IA) and family environment

Variable		1	2	3	4	5	6	7
1. IA	Pearson's r	—						
	p-value	—						
2. Have_ breakfast_ together	Pearson's r	-0.238 ***	—					
	p-value	< .001	—					
3. Have_ evening_meal_ together	Pearson's r	-0.197 ***	0.444 ***	—				
	p-value	< .001	< .001	—				
4. Have_fruits	Pearson's r	-0.204 ***	0.192 ***	0.267 ***	—			
	p-value	< .001	< .001	< .001	—			
5. Have_ vegtables	Pearson's r	-0.158 **	0.196 ***	0.287 ***	0.606 ***	—		
	p-value	0.002	< .001	< .001	< .001	—		
6. Have_sweets	Pearson's r	0.102 *	0.138 **	0.072	0.008	-0.061	—	
	p-value	0.035	0.004	0.132	0.861	0.226	—	
7. have_cake_ soft drinks	Pearson's r	0.130 **	0.157 ***	0.082	-0.145 **	-0.155 **	0.563 ***	—
	p-value	0.006	< .001	0.082	0.002	0.002	< .001	—

* p < .05, ** p < .01, *** p < .001

Table 13. Pearson's correlation between internet addiction in children (IA) and academic performance and environment

Variable		1	2	3	4	5	6
1. IA	Pearson's r	—					
	p-value	—					
2. Education_ performance	Pearson's r	-0.168 ***	—				
	p-value	< .001	—				
3. School_feeling	Pearson's r	-0.162 ***	0.226 ***	—			
	p-value	< .001	< .001	—			
4. School_pressure	Pearson's r	0.219 ***	-0.278 ***	-0.352 ***	—		
	p-value	< .001	< .001	< .001	—		
5. Schoolwork_ problem	Pearson's r	0.306 ***	-0.320 ***	-0.409 ***	0.456 ***	—	
	p-value	< .001	< .001	< .001	< .001	—	
6. School_ Comparative_ perfomance	Pearson's r	-0.215 ***	0.587 ***	0.310 ***	-0.283 ***	-0.323 ***	—
	p-value	< .001	< .001	< .001	< .001	< .001	—

* p < .05, ** p < .01, *** p < .001

ISBN 978-0-99-702549-1



www.wish.org.qa