

BRIEF ARTICLE

Perception towards the effects of Internet-based education among adolescents: A cross-sectional study

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ABSTRACT

Background: In the era of internet dependency on education, the study aimed to determine the perception of the effects of internet-based education (IBE) among adolescents.

Methods: This cross-sectional study included conveniently selected 140 adolescent students and 60 of their parents from a secondary school located in Sabujbag thana of Dhaka city. Data were collected through a questionnaire-based interview on adolescents' IBE and its physical, psychological, and social effects.

Results: On average, adolescents and parents were 15 and 42 years old. Parents provided more negative input on physical health such as headache (88.3 vs 65.0%, $P<0.01$), sleep disruption (76.7 vs. 52.9%, $P<0.01$), and backache (90.0 vs 44.3%, $P<0.01$) compared to the adolescents. However, they had similar perceptions about physical activity. Parents showed more concern about the potential loss of motivation and self-discipline (73.3 vs 48.6%, $P=0.002$). Adolescents were more optimistic about community networking (92.9 vs. 81.7%). The opposite views were expressed by the parents that long screen time undermines societal values (66.7 vs. 15.7%, $P<0.001$).

Conclusion: Although there were differences between the perceptions of parents and adolescents, IBE was favoured in many instances such as painting/drawing skills, getting updated information, school performance, social skills, and community networking.

Keywords: online education, internet-based education, online learning

INTRODUCTION

Online education, also known as internet-based education (IBE), has gained popularity due to its flexibility, especially during the COVID-19 pandemic.¹ Several online learning options are available, including Canvas, Microsoft Teams, Google Meet, Skype, and Zoom.² Benefits include adaptability, continuing education during the pandemic, and access to various resources. Adverse effects include effects on vision, self-control, focus, exercise, and excess consumption. Young adults who use the internet excessively may experience health problems, including headaches, stiffness, and sleep disturbances.³

The online realm provides extracurricular opportunities, including arts, music, sports, and volunteer work⁴, and it can reinforce self-identity and self-esteem⁵. However, the internet has its drawbacks, with potentially harmful content that may erode societal

values⁶. Overall, internet literacy of children might be beneficial as opposed to the common belief of exposure to harmful content and promotion of sedentary behaviour. This study aimed to determine perceptions of IBE's effects on adolescent students of an urban area of Dhaka.

METHODS

Study subjects

This cross-sectional study was done from October to November 2022 in a secondary school in Sabujbagh Thana of Dhaka City, Bangladesh. Ethical approval and permission from the school authority were taken before a data collection schedule. We selected adolescents from grades VIII and IX familiar with IBE and one of their parents conveniently. Based on an Egyptian study⁷ where 43.4% of parents perceived more negative than positive internet effects on children's health, we calculated our sample size using the $Z^2p(1-p)/d^2$

HIGHLIGHTS

1. Internet-based education may encourage adolescents to participate in extracurricular activities and increase the desire to learn.
2. Adolescents and their parents observed some negative impacts of internet-based education on physical and psychological health but favored its use for issues like painting/drawing skills, indoor physical activity, getting updated information, better school performance, earning leadership quality, and enhancing social social skills.

formula with a 5% significance level and 8% error margin, which was 147. We invited 140 adolescents and their parents for interviews. All adolescents but 60 parents participated in the interview in the school premises after getting parents' consent and adolescents' assent.

Data collection

A pretested questionnaire was used to gather information on the adolescents' internet usage patterns, including their attachment to IBE, hours spent online, usage locations, devices used, and visits to formal educational websites. The questions included: (1) physical effects of internet use such as headache, negative impacts on vision, altered sleep habits, and backache; (2) psychological effects assessing engagement in activities like painting, and indoor physical exercises, academic performance, social expression, leadership, motivation, discipline; and (3) social effects like a building of global networks, participating in community volunteer work, and adherence to societal values.

Statistical analysis

The statistical analysis was done using the Statistical Package of Social Sciences, version 26. Data were presented using frequency and percents. The chi-square test was used to examine the differences between adolescents and parents. A $P < 0.05$ was considered statistically significant.

RESULTS

The adolescents and their parents were 15 years and 42 years old on average, in respective order. Seven in 10 adolescents and eight in 10 parents were females. Most of the parents had postgraduate-level education, and half were employed.

About three-quarters of adolescents (78.6%) and half of the parents (55.0%) use IBE sites daily for 2 hours or less. The commonly used sites were Zoom (73.3% parents and 87.9% adolescents), followed by Google Classroom (55.0% parents and 36.4% adolescents) (**TABLE 1**).

TABLE 1 Background data on internet use in formal settings by adolescents and their parents, number (%)

Internet usage data	Parents (n= 60)	Adolescents (n= 140)
Internet use time		
Daily	48 (80.0)	86 (61.4)
≤ 2 hours	33 (55.0)	110 (78.6)
>2 hours	27 (45.0)	30 (21.4)
Common devices		
Smartphone	43 (71.7)	133 (95.0)
Others	17 (28.3)	7 (5.0)
Common locations		
Home	60 (100.0)	139 (99.3)
Others	0	1 (0.7)
Commonly used internet sites		
Zoom	44 (73.3)	23 (87.9)
Google Classroom	33 (55.0)	51 (36.4)

A significantly higher proportion of parents than adolescents reported that IBE causes headaches (88.3 vs. 65.0%, $P < 0.01$), sleep pattern disruption (76.7 vs. 52.9%, $P < 0.01$), and backache (90.0 vs 44.3%, $P < 0.01$) (**TABLE 2**). However, there were perceptions of benefits of IBE. Parents and adolescents almost equally believed IBE promoted painting/ drawing skills (76.7 vs. 80.7%) and getting resourceful and up-to-date information (95.0 vs. 97.9%), performance in school (90.0 vs 89.3%), and leadership qualities (88.3 vs

Table 2 Perception about the physical, psychological and social effects of internet-based education, number (%)

Effects of internet-based education	Parents (n= 60)	Adolescents (n= 140)	P*
Physical effects			
Headache	53 (88.3)	91 (65.0)	0.001
Negative impact on vision	56 (93.3)	117 (83.6)	0.07
Sleep disruptions	46 (76.7)	74 (52.9)	0.002
Backache	54 (90.0)	62 (44.3)	<0.001
Psychological effects			
Boost up of painting/ drawing skills	46 (76.7)	113 (80.7)	0.65
Practicing indoor physical exercise	45 (75.0)	127 (90.7)	0.007
Helps getting updated information	57 (95.0)	137 (97.9)	0.37
Better performance in school	54 (90.0)	125 (89.3)	0.99
Development of leadership personality	53 (88.3)	115 (82.1)	0.30
Loss of motivation and self-discipline	44 (73.3)	68 (48.6)	0.002
Social effects			
Enhances social skills	52 (86.7)	126 (90.0)	0.47
Builds a community network	49 (81.7)	130 (92.9)	0.03
Screen time undermines societal values	40 (66.7)	22 (15.7)	<0.001

*Chi-square test

82.1%). However, significant differences in responses among parents and adolescents were seen for the effects of indoor physical exercise (75.0 vs 90.7%, $P < 0.01$). They perceived IBE's adverse impacts on motivation and self-discipline (73.3% vs 48.6%, $P < 0.01$). Many parents and adolescents believed that IBE improved social skills (86.7% vs. 90.0%) and voluntary work in the community (91.7% vs 87.1%). In contrast, a contrasting opinion was seen that spending time on the screen undermined societal values (66.7% vs 15.7%, $P < 0.001$).

DISCUSSION

Contrary to the common belief, this study revealed participants' perception that IBE has many positive sides. Similar findings have been observed in Egyptian⁷ and Banglaeshi⁸ studies. A few other studies reported that Zoom and Google Classroom emerged as adolescents' preferred online learning platforms.^{2, 9} These platforms have facilitated the use of various applications and allowed for online learning to be conducted effectively.

A consensus exists among parents and adolescents that IBE diminishes physical activity and adversely affects visual health. Parents express greater concern about headaches, sleep disturbances, and backaches compared to adolescents. These findings resonate with a Turkish study, which identified significant physical symptoms such as headaches, stiffness, backache, neck pain, and insomnia.¹⁰

Around 90% of participants (including parents and adolescents) noted that IBE helps adolescents access information, enhances academic performance, and fosters leadership qualities. Approximately 75% of parents and adolescents believe that IBE may strengthen painting and drawing skills. However, adolescents opined that IBE may facilitate indoor physical exercise.

The current study found that parents were more concerned than adolescents about potential impacts on loss of motivation and self-discipline. This has the potential to change the adolescent's behavior unfavorably, unlike a study from Brunei.¹² The UK and

Indonesian studies show a preference for digital over paper-based reading despite a prevalent skimming habit online knowing that adolescents' rudeness may have some link with screen time¹¹⁻¹⁴. Many people might have counted on the benefits of extracurricular activities.^{4, 15} Early evidence suggests that online time displaces productive activities and face-to-face interactions, and harmful online expressions can erode social values.^{4, 6, 15, 16} Our participants, somehow, believe that IBE increases social skills and community networking despite erosion of social values. Further studies are necessary to clarify it.

There are several limitations in this study. First, the study collected data from a specific age group of adolescents in a particular school in Dhaka city, so the findings cannot be generalized to schools in general in the country. Second, a big non-response rate among the parents might have impacted our results. Third, we use a relatively large error rate (that has led to a small sample size) in our sample calculation considering the time and resources available.

Conclusion

The adolescents and their parents believe that there are harmful impacts of IBE. These are headache, sleep disruption, backache, loss of self-discipline, etc. Nonetheless, they (participants) believe that IBE has many favourable impacts too. These are painting/drawing skills, getting updated information, school performance, leadership quality, social skills, and community networking. Further research is needed for elucidating factors specific to Bangladesh and children in general, given that our data lack generalizability.

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Author Contributions

Conception and design: JS and BKP; Acquisition, analysis, and interpretation of data: JS and BKP; Manuscript drafting and revising it critically: JS, MAH, BKP; Approval of the final version of the manuscript: MAH, BKP, SSI, JS; Guarantor accuracy and integrity of the work: MAH, BKP, SSI.

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Conflict of Interest

We don't have any conflict of interest.

Ethical Approval

We obtained ethical approval from the Institutional Review Board of Bangabandhu Sheikh Mujib Medical University, bearing memo number BSMMU/2022/8892, dated 4 September 2022. All participants were apprised that their involvement was entirely voluntary and would not yield any immediate benefits.

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