

An Investigation on How Digital Marketing Affects Women's Health Through Excessive Use of Technology

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Abstract

This study examines two areas of women's entrepreneurship in digital marketing: economic gain and health obstacles. For a lower investment, ease of access, and economic gain, women entrepreneurs spend a period of time with technology to maintain their online business. But technology is not always suitable for human health, and excessive use of technology impact on women's health. Based on the theoretical framework, we want to explore three questions: what type of health both physical and mental problems are arising from technology use, why, and how these emerge. With 68 participants, this study was conducted through a semi-structured questionnaire from July to December 2023. For a mixed-method research approach, data were collected from several parts of Bangladesh through online, revealing that the excessive use of technology impacts on health of women. The study revealed that despite economic benefits, prolonged use of the device leads to health issues like anxiety, stress, obesity, headache, migraine, and body pain. Less family time, social isolation, sedentary behavior, technostress, and online bullying are some of the reasons behind stress and dissatisfaction among women. Quantitative analysis also disclosed that a correlation exists between the device and several health problems in digital marketing. The paradox between health variables and the excessive use of technology should be removed to make a sustainable digital platform. Our study also recommends policy mediation, including the awareness of healthcare, digital literacy, and development initiatives.

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Keywords: Digital Marketing, Women's Health and Entrepreneurship, Impact of Using Digital Devices, Women's Health in Bangladesh

Introduction

Digital marketing is the promotion of brands to connect with potential customers using the internet and other forces of digital communication (What Is Digital Marketing? Benefits, Types, & Amp; Tips, n.d.). It makes marketing easier by providing a platform for targeted advertising, precise audience segmentation, real-time analytics, and cost-effective campaigns (Duggal, 2024). Besides, digital marketing plays a pivotal role in women's empowerment, particularly in developing nations, as it eliminates the need for substantial capital investment typically required for establishing a physical storefront, such as rent, interior decoration, and other associated expenses. This digital approach enables women to manage and grow their businesses from home, allowing them to balance entrepreneurial pursuits with household responsibilities effectively. As of January 2023, there were about 66.94 million internet users in Bangladesh (Kemp, 2023). Another report from BTRC (Bangladesh Telecommunication Regulatory Commission) shows that as of 2021, there is a total of 123.82 million internet subscribers in Bangladesh (Issue-I, 2022). According to Data Reportal, there were around 44.70 million social media users in Bangladesh in January 2023 (Kemp, 2023b). Nowadays, women are more engaged in economic activity than before. It has many positive impacts on the economy and socio-economic conditions. Women's empowerment increases their family status by economically or socially reducing the gender gap, ensuring women's rights, and finally growing the economy more than it was in the past. According to BBS, women's participation has increased from 36.3% to 42.68% during the last five years (Utsa, 2024). Bangladesh could increase its economic growth by ensuring women's participation in economic activity sustainably.

However, the concerning issue is that prolonged use of technology may affect the health of women and students, which is related to physical and mental health, like obesity, fatigue, body pain, headaches, and depression. Despite growing concerns, the impact of technology on human health, particularly the effects of excessive technology use driven by digital marketing, remains insufficiently explored, especially in the context of women's health. Several studies emphasize the simple relationship between

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prolonged screen time and health issues without concern for the excess use of technology in digital marketing by women entrepreneurs.

Therefore, the present study aimed to determine the health-hazardous effects of screen time on women who are involved in digital marketing in Bangladesh, which is necessary to fill the gap by screening the negative impact on women's health due to the excessive use of technology in the digital marketing sector. It will explore how women are affected by device use for online business, identify the health issues they face as a result of prolonged device engagement, and examine the correlation between technology use and their health indicators. Findings may focus on the awareness of technology use and will be helpful for online entrepreneurs, educators, and policymakers to reduce the negative impact on women's health.

Objective of the study:

The research had the following objectives:

- i) To determine the age group involved in digital marketing, through a demographic overview.
- ii) To examine the physical and mental health issues impacted by the use of technology for digital marketing.
- iii) To investigate the correlation between health-related variables and prolonged screen time.

Literature review:

According to Lee and Zarnic (2024), technology has a positive and negative impact on human life in many dimensions. While the potential use improves productivity and economic well-being, excess use of technology increases the risk to human life, like poor performance of students, anxiety, and depression among young women. However, digital technology makes the world tiny but increases social isolation and loneliness. Misinformation, mistrust, and online bullying may have a serious impact on women's mental health, which is the darker side of technology.

Girela-Serrano et al. (2024) reviewed previous research work from 2011 to 2019 to assess the impact of mobile phones or other wireless devices on children and adolescents' mental health and found that the devices are associated with poor mental health. As the devices used rate increased after the COVID-19 outbreak, this arena should be kept in focus more. The Yale Department of Psychiatry and Colombia School of Nursing examined brain development and child health in the US study found that young people who

spend excess time on technology face internalizing problems such as depression, anxiety, social anxiety, and somatic complaints compared to lower time spending young people, while there were no relationships found between the frequent screen time and externalizing problems including physical aggression, verbal bullying, relational aggression, defiance, and other concerns. This brain change development has no impact on externalizing problems. The participants of 9- and 10-year-olds were involved in this study, while the sample was 5100.

Goldfield et al. (2015) examined the relationship between screen time and HRQOL (Health-related quality of life) in overweight and obese adolescents. According to the study, 261 female participants and 97 males aged between 14 to 18 years old spent their time on screen by using a computer, watching TV, and playing video games. The study found no difference between men and women who have less physical activity, improper diet, and long screen time associated with decreasing HRQOL. The study suggests that more research can conclude that lower screen time increases the level of HRQOL.

According to the study by Shiue (2015), higher incidences of heart attacks, heart murmurs or other cardiac problems, and irregular heart rhythms were linked to reporting watching TV and/or screens for 4+ hours, 5+ hours, and eight or more hours, respectively. The study found 5527 Scottish adults (57%) aged between 16-99 passed screen time daily for 3+ hours on average while 414 Scottish children (20.7%) aged between 4-12 passed screen time for 3 hours or more which can cause hypertension, angina, stroke, diabetes, chronic obstructive pulmonary disease and poor self-rated health and mental health. The author suggests that minimizing screen time protects cardiovascular, respiratory, and psychiatric health. Davies et al. (2012) collected cross-sectional data for 3796 Australian adults during 2008-2010 to assess the physical activity and screen-time activity on health and found unhealthy days and significant health status in women. According to their study, the highest detrimental effect on health-related quality of life was shown when excessive screen time was combined with a lack of physical activity.

A thorough understanding of the relationship between various electronic device types and health status is advanced by the constant negative health consequences linked to computer use, computer gaming, and TV watching that were tempered by age, gender, and BMI (Wei et al., 2023). The author conducted multivariate linear regression to find out the correlation between

the four types of electronic device use and health conditions from the data of 376,806 people aged between 40 to 69 years from the UK Biobank. Self-related health, multisite chronic pain, and total physical activity of male participants were less affected compared to other participants. According to Celis-Morales et al. (2018), the risk of mortality, cardiovascular disease, and cancer is related to sedentary behavior, which is directly related to screen time. Among 390,089 of the total participants, 54% of women from the UK Biobank were included in the study. The authors found that the health hazards increased with every 2-hour increase in screen time. On the other hand, participants who had physical activities and fitness were at lower risk of health problems. The study suggested that lower screen time can reduce the health risks.

Roy et al. (2024) intended to explore the prevalence and association of migraine and tension-type headache among students who continued online study in Bangladesh. A total of 771 students were selected for this research by the quota sampling method. The study revealed that 47.08% of the participants had tension-type headaches, which was associated with a longer duration of online study, moderate-to-severe depression, and use of multiple devices. However, the longer periods of online study, depression, history of eye problems, insomnia, and moderate-to-severe depression were significantly related to migraine headache.

In spite of the heavy literature on device use on human health, there is a significant gap concerning the digital working time of women entrepreneurs in the present world. Women who are engaged in online business face dual challenges -achieving economic stability and addressing health issues. During the COVID-19 pandemic, the use of devices for online business purposes has increased remarkably. So, it should be a concern for us that the sustainable online working for women. Women also have some gender-specific vulnerabilities and fertility issues. This research also links women's health and technology use in digital marketing. In this regard, our study tries to find out the health problems faced by women in the digital marketing platform.

Theoretical framework:

Today's online platform creates a vast opportunity for women to make themselves economically strong. They use this platform for selling products to a large customer. Lower investment, vast audience, and easy access make this platform suitable for women. Without women participants is harder to make an inclusive society. Real empowerment is not improving from just

an excess of education, but rather about gaining freedom and ensuring that women's opinions are heard along with empowerment in all sectors of society (Kabeer, 2005). Women's empowerment will improve their rights, security, and self-development. Excess use of technology for online jobs or business may create a negative impact on human health. It also impacts daily life constantly. Information and work overload, invasion of personal life, and privacy. Difficulty handling complex technology, threat to job security, and uncertainty about changing technology are the main factors of technostress that can reduce job satisfaction, mental fatigue. For better productive work, technostress should be controlled. According to Tarafdar (2007), people experience stress due to the use of technology in the job sector. An increased physiological pressure.

Prolonged sitting jobs have drastically increased in the last few decades. Less physical activity causes health risks like cardiac problems, obesity, fatigue, and stress. Compared to our past generation, we are less active at our workplace due to advanced technology. Less activity, less exercise, and prolonged sitting in one position may cause diabetes and obesity (Owen et al, 2010). Rapid growth of technology takes place in a major portion of our daily lives. Moreover, Women who are engaged in an online platform a long period with fewer breaks and less physical activity may create health problems.

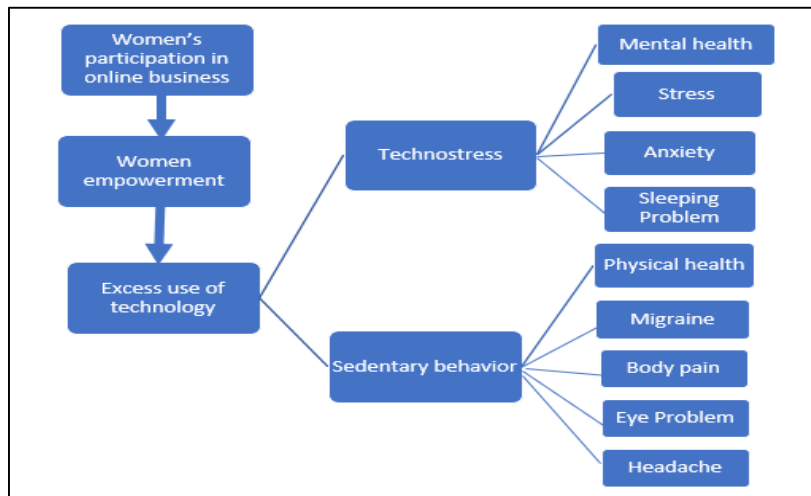


Figure 1: Theoretical Framework

Methodology

The study focuses on Bangladeshi women who engage in Internet commerce or digital marketing as entrepreneurs. A semi-structured questionnaire was used to conduct the survey, and the sampling method was done with convenience and snowball sampling. Snowball sampling involves gathering data from one or more participants first, then moving on based on recommendations from those individuals. The survey was conducted online via Facebook, Messenger, Email, WhatsApp, and LinkedIn, as well as through direct in-person contact via random one-on-one interviews with target respondents in a Google form. This is a mixed-method study to find out the health hazards caused by digital devices used in digital marketing in Bangladesh. This procedure was carried out repeatedly during 6 months of continuous surveying and attained a total of 110 samples. As our main target was to find out the health hazards of women, 68 samples of female respondents were finally selected for the calculation, and our response rate was 100%. There were 44 pertinent, open-ended, and closed-ended questions in the questionnaire. The results were displayed in graphs that include a thorough explanation of the gender, age, hours spent using electronic devices (laptops, cell phones), average and attended number of phone calls, usage timing, frequency, and heavily used social media and websites, patterns of holiday celebrations, the entrepreneurs' potentially dangerous health symptoms, and their reliance on medication. The qualitative data were described through a thematic analysis, while the quantitative data were analyzed through correlation.

Results and Discussion

This part of the study is divided into three important segments. The first part of the findings comprises the participants' demographic overview and some simple statistics. The second section is of thematic analysis. Finally, the third portion analyzes the correlation between the health variables and technology use.

Demographic view of the participants

Table 1 presents detailed characteristics of respondents' support by age, marital status, and educational qualification. Respondents were divided into three age groups, with the largest portion belonging to the 16-25 age group (75%) and the 26-35 age group (16%), and the rest being 36 years old or above (9%). Moreover, the majority of the respondents (81%) were unmarried, and the rest of them were married (19%). Most of the respondents' highest educational

qualification was HSC (48.32%) and graduation (30.89%), which indicated that the students at the tertiary education level were mostly involved in digital marketing, also supporting the age group findings of the present study. However, the college-level students, as well as post-graduate level students, are also involved in digital marketing.

Table 1: Age, marital status, and educational qualification of the respondents

Distribution of Age (Years)		Distribution of Educational Qualifications	
Category	Percentage	Category	Percentage (%)
16-25	75%	SSC	1.47
26-35	16%	HSC	48.52
36 above	9%	Graduation	30.89
Distribution of Marital Status		Postgraduation	17.65
Married	19%	PhD	1.47
Unmarried	81%		

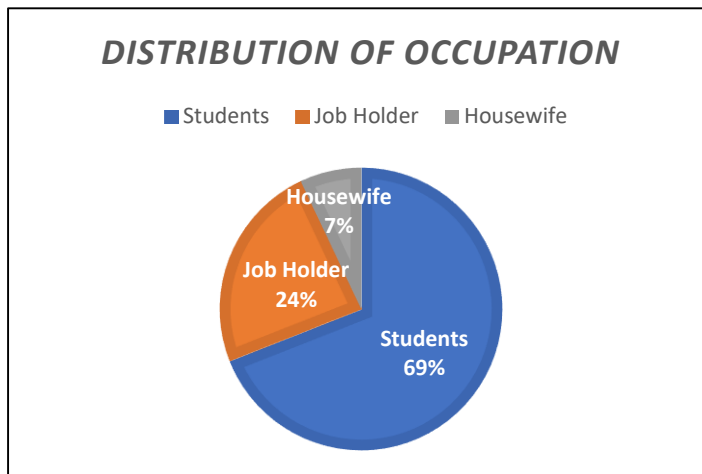


Figure 2: Distribution of the occupation of the respondents

From Figure 2, the distribution of the occupation can also be observed, and it is visible that 69% of the total respondents were students, which is similar

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to the findings of the other demographic profile. These findings were also supported by Khatun (2016), who found that 52% of the total respondents were in the age group of 20-30, who were more inclined towards technology and its usage in online marketing. Khan et al. (2022) also showed that most of their respondents were in the age group of below 25 years (>18 years) and of graduate level. However, 24% of jobholders and 7% of housewives were also involved in digital marketing.

Thematic Analysis:

According to our primary data, we found seven themes under the excess use of technology on women's health in digital marketing. The themes are-

1. Economic growth from the online platform.
2. Use of devices in digital marketing
3. Use of the devices impacts physical health
4. Use of the devices impacts mental health.
5. Less family pressure for online work
6. Dual challenges- Empowerment vs health issues.

1. Economic growth from the online platform

During and after the COVID-19 pandemic, the number of online entrepreneurs increased remarkably due to a rise in online consumption and increased dependency on devices. Moreover, entrepreneurs are also flexible with this because of smaller investments, lower operating costs, freedom of work, mobility, and easy marketing, as well as large clients and significant financial gains.

Table 2: Distribution of income of digital entrepreneurs

Category	Percentages (%)
Near 10,000	69.11
10,000 to 20,000	19.11
20,000 to 30,000	4.41
Above 30,000	7.35

More than half of the participants (69.11%) had a monthly income near 10000 Taka, which was not a smart amount for a family but sufficient for a student, thus representing the respondents as students. Additionally, 19.11% of participants earned between 10000 and 20000 Taka per month,

this income range might be comfortable for a small family or students. So, these two groups might be the representation of the involvement of students in entrepreneurship and contribute positively to the microeconomy of the country. 4.4% of participants had a monthly income ranging from 20000 to 30000 Tk, while the remaining participants earned more than 30000 Tk per month, which represented the involvement of the working women in online business to have financial solvency through extra income. These findings contradict the findings of Khan et al. (2022). Their study showed 70.80% of the respondents earned between 20,000 and 50,000 BDT per month, which might be due to the increased competition and lack of experience among female digital marketers.

2. Use of devices in digital marketing

Digital marketing is a device-friendly platform; in this regard, users have to work with devices like mobile, laptop, and desktop. Use of the device depends on two major wings: 1. Choice of device for digital marketing, 2. Participants spent time with devices, and 3. Preferred time of using the device.

Table 3: Choice of device for digital marketing

Category	Percentages (%)
Mobile	43
Laptop	12
Both	37
Desktop	8

Table 3 illustrates the devices used by the participants for their digital marketing activities. The majority of participants (43%) used only mobile phones for their digital marketing activities, which indicated the user-friendliness of this device or the inability to afford other devices like laptops or desktops. However, 37% of the total participants used both mobile phones and laptops and supported that most of the working women, as well as financially solvent students, could afford both devices and be able to utilize them in entrepreneurial activities. 12% of users depended on laptops, while 8% of the total respondents used desktops for digital marketing.

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Table 4: Participants spent time with devices

Time spent with devices (in Hours)	Users (%)	Time spent (in Hours)	Mobile Users (%)	Laptop Users (%)
Above 8 Hours	5.80%	Above 5 Hours	32.35%	10.29%
6-8 Hours	4.40%	4-5 Hours	10.29%	11.76%
4-6 Hours	23.50%	3-4 Hours	27.94%	17.65%
2-4 Hours	32.40%	2-3 Hours	16.18%	20.59%
Below 2 hours	33.80%	Below 2 hours	13.24%	39.71%

Approximately 34% of the female respondents spent with devices below 2 hours, while 32.40% of participants spent 2-4 hours with devices in a day (Table 4). Most of the participants spent time with devices at most 6 hours/day, which indicated their involvement with study or other occupations, while approximately 10% spent more than 6 hours, which indicated their full-time involvement with digital marketing (Table 4). The participants were also asked to respond about the time spent with mobile phones and laptops separately and the survey found most of the participants (32.35%) spent with mobile phones above 5 hours/day, while 39.71% of the participants spent laptops below 2 hours/day, which indicated that the mobile was mostly preferred as a user-friendly and cost-effective device (Table 4). According to Shovon (2017), their investigation found that 50% of the total respondents spent 1-5 hours with mobile phones using social media and YouTube, which is closer to our findings.

Figure 3 shows that most engagement with devices at the evening or before bedtime. Approximately half of the participants are using the device from 6 pm to 12 am, which indicates that the students are preferring this time for their online activities, after completing their colleges, universities, and all sorts of academic activities. 22% of participants use the device from 6 am to 12 pm. 19% of them spent time with the device from 12 pm to 6 pm. However, the 6 pm to 12 am time duration is preferred because of huge client engagement and, free time of participants. On the other hand, it will be a cause of sleeping disruption, poor sleep, and a negative impact on the next day's work efficiency. Screen time should be lower before sleeping because blue light can cause insomnia or other harmful effects. It can also reduce the quality time with family members.

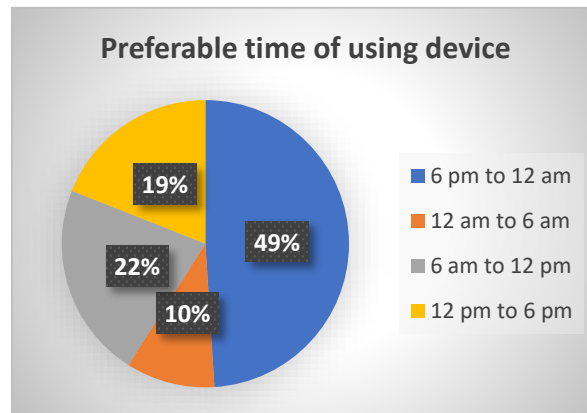


Figure 3: Preferred time of using devices

3. Use of the devices impacts physical health

Table 5 shows that body pain and headaches are the most prevalent health issues, affecting 71% and 60% of participants, respectively, followed closely by eye problems (59%) and migraines (49%). The significant proportion of affirmative responses across all categories suggests a considerable burden of these health issues within the study population. The presence of a "May Be" category for headaches and eye problems, but not for migraines or body pain, may reflect diagnostic ambiguity for less specific symptoms, potentially due to overlapping clinical presentations or self-reporting challenges. Long periods of using devices, poor sleeping, anxiety, an undisciplined lifestyle, and eye strain might cause a headache in 60%. Migraine problems are caused by anxiety, stress, hormonal problems, sleeping problems, environment and light sensitivity, and low blood sugar, in women (Migraine, n.d.). So, the comparative ratio between headache and migraine sufferers it can be said that device using tendency might have caused similar problems. Prolonged use of digital devices causes "digital eye strain" (DES), which refers to a group of visual and ocular problems such as dry eyes, itching, headaches, blurred vision, watering, and a feeling of a foreign body (Kaur et al., 2022). The radiation from devices is also harmful to the human eye and brain (Cell Phones and Cancer Risk Fact Sheet, 2024). Insomnia is caused by spending too much time with devices like a laptop or phone, especially blue light, which can lead to sleep deprivation (Qanash et al., 2021). Finally, long-term insomnia can cause memory problems, depression, anxiety, etc. (Pendick, 2020). According to

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the study, most of the participants were young, so the eye problem in the early stage of life was a big health concern. Computer vision syndrome, also known as digital eye strain, is a condition characterized by prolonged use of digital devices, resulting in eye irritation, blurry vision, and headaches (Computer Vision Syndrome, 2024).

Table 5: Distribution of health problems

Category	Percentages (%)		
Health Issues	Yes	No	May Be
Headache	60	22	18
Migraine	49	51	-
Eye Problem	59	38	3
Body Pain	71	29	-

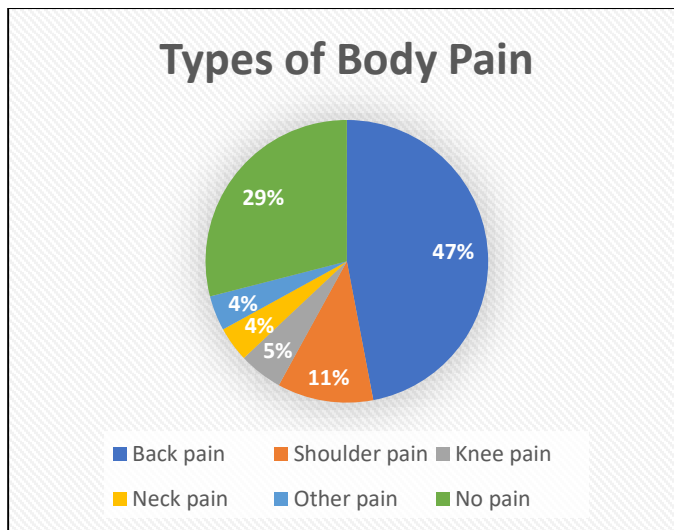


Figure 4: Types of Body Pain

The pie chart in Figure 4 illustrates the distribution of body pain types among the studied population, showing that back pain is the most prevalent, reported by 47% of participants, suggesting a significant health concern potentially tied to prolonged sitting or physical strain, which is consistent with findings from Hoy et al. (2014), who reported back pain as a leading cause of global disability, often associated with sedentary lifestyles or manual labor. Shoulder pain affects 11% of respondents, indicating a

moderate issue that may relate to repetitive movements or occupational stress, which aligns with observations by Van Der Windt et al. (2000), who linked shoulder complaints to repetitive strain in occupational settings, though its lower incidence here may reflect context-specific factors. Knee pain and neck pain are less common, with 5% and 4% prevalence, respectively, possibly linked to specific activities or age-related changes, which mirrors data from Woolf and Pfleger (2003), suggesting these conditions are often age-related or tied to joint overuse, potentially indicating a younger or less physically demanding cohort in this study. Other types of pain account for 11%, reflecting a variety of less frequent complaints, while 29% of participants reported no pain, highlighting a notable proportion unaffected by body pain. These findings emphasize the need for targeted interventions, particularly for back pain, and highlight the value of comparing this cohort's pain profile with larger populations to refine preventive strategies.

Proper sleeping leads to a healthy and productive life (Good Sleep for Good Health, 2024). When asked about their average sleeping time, it was found that 48.53% (almost half of the total participants) reported getting a proper sleep of approximately 6-8 hours per day on average (Table 6). However, among the remaining participants, 36.76% had a sleeping time of 4-6 hours, while 4.41% had only 2-4 hours of sleep, which might be due to excessive workload or some other health impacts like insomnia, headache, etc. (Table 6). Table 6 also shows 30% of participants had sleeping problems, whereas 60% of participants had no issues, and the rest had uncertainty regarding this problem. Using mobile devices before sleep, anxiety, workload, bad headaches, back pain, and lack of physical activity may cause sleeping problems (Demir & Sümer, 2019). 60% of participants may maintain a healthy life and enjoy a good sleep at night compared to 30%.

Table 6: Participants' average sleeping time and sleeping problems

Sleeping Time (Average in a day)	Participants	Sleeping Problem	Frequency	Percentage
2-4 hours	4.41%			
4-6 hours	36.76%	Yes	20	30%
6-8 hours	48.53%	No	60	60%
Above 8 hours	10.29%	May be	10	10%

4. Use of the devices impacts mental health

Overuse of technology may negative impact on mental health, like anxiety, stress, obesity, and so on. It can reduce the quality and increase mental dissatisfaction. Our respondents work at social media via chatting, voice messages, Messenger, and video calls. So, the late message reply, online bullying, immediate reply, constant notification checking, arguments with clients, misunderstanding over the phone, all of these can lead a mental stress for a young entrepreneur, which may create mental instability within the respondents. According to Table 7, one-third of our participants feel high stress (36%), more than half (51%) feel mid-level stress 36% and a few felt lower-level stress over online working.

Table 7: Stress level and Exercise ratio of respondents

Stress level of respondents		Exercise ratio of participants	
Category	Percentage	Category	Percentage
Lower-level stress	13%	Yes	46%
Medium level stress	51%	No	47%
Higher-level stress	36%	May be	7%

According to the Centers for Disease Control and Prevention (CDC), “Regular physical activity is one of the most important things you can do for your health”. There are numerous preventative and therapeutic advantages to exercise for both mental and physical health, even if it is less than the recommended quantity; any amount of exercise is likely to have positive effects (Daniels, 2021). A total of 46% of participants were concerned about their future healthy life, and they believed that physical exercise can reduce the risk of chronic diseases like cardiovascular disease, obesity, and anxiety (Table 7). However, 7% of the females were irregular in daily exercising, while a major portion of respondents (47%) were not aware of their healthy lives (Table 7). They might have a risk of body pain, anxiety, obesity, poor sleep, and mental stress.

When the respondents were asked about the satisfaction of their current level of physical fitness and mental health, they responded as follows in Table 8:

Table 8: Satisfaction rate with physical fitness and mental health among respondents

Category	Percentage
Yes	46%
No	37%
May be	17%

The physical problem is highly correlated with mental dissatisfaction, which reduces the productivity level of a person (Qiu et al., 2021). Among the participants in the present study, 37% were not satisfied with their mental and physical health (Table 8). These participants were not satisfied with their health issues, i.e., they might have some critical condition regarding mental and physical health. However, 46% were satisfied, which indicated they didn't feel any physical or mental instability due to work pressure, while the rest of them were confused about their satisfaction (Table 8). Moreover, all of the participants confessed to suffering from online bullying while involved in digital marketing. This is also supported by the previous study of Mahmud et al. (2023) and Unb (2020), where their findings said that Bangladesh has a high prevalence of cyberbullying, with 80% of victims being women between the ages of 14 and 22.

5. Less family pressure for online work-

According to responses, three-fourths of participants didn't feel pressurized by family to work on an online platform (Table 9). That is, they don't feel any obstacles to work and control over long screen time from family members. Moreover, their family was not concerned about their health issues, which might be affected by technology (Table 9). Just 16% of participants got boundaries or pressure from family about online work, and 9% were uncertain (Table 9). Family pressure has a significant negative impact. Less family pressure may encourage more work in the online sector, which creates sedentary behavior and increases technostress significantly. According to Huang et al. (2021) family support is critical to employees because it motivates innovative behaviors and mitigates job stress. Their study found that family support significantly impacts the well-being of high-technology employees, fostering work engagement and subjective well-being, which support, provided without expectation, promotes comfort and care, ultimately impacting personal life.

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Table 9: Description of family pressure on participants

Category	Percentage
Yes	16%
No	75%
May be	9%

6. Dual Challenges-Empowerment and health issues:

Women face several challenges towards empowerment, such as the gender pay gap, social barriers, gender discrimination, a lack of opportunity for higher education, and family support. These obstacles reduce their ability to prove themselves. Along with they have several physical challenges like fatigue, body or joint pain, and mental health. Moreover, they have productivity issues and housework.

Most of the participants in this study were students, jobholders, and housewives. They could avail their time for online work after their daily life work, such as academic work, office work, and household work. Involving oneself in more work time is good for economic growth for both personally and nationally. Especially, involvement in digital marketing is a must in the era of the 4th Industrial Revolution. But technology-based work may impact physical and mental health. So, it's a concern for them to maintain a sustainable, healthy life with empowerment issues.

Correlation between the health issues and device use:

Table 10. Correlation Insights: Digital Behavior vs Health

Digital Behavior Variable	Health-Related Variable	Correlation	Insight Summary
How much do you spend on marketing devices?	Problems sleeping	0.22	Small positive link to sleep problems
	Problems with your eyes	0.05	Minimal link to eye issues
	Headaches	0.02	No significant link to headaches

Digital Behavior Variable	Health-Related Variable	Correlation	Insight Summary
	Migraine issue	0.06	Small positive link to migraines
	Other body pain	0.16	Moderate positive link to body pain
Mobile hours	Problems sleeping	0.07	Mild positive link to sleep issues
	Problems with your eye	0.07	Slight link to eye strain
	Headaches	0.09	Weak headache connection
	Migraine issue	0.09	Slight migraine link
Mobile hours	Other body pain	0.08	Small link to body pain
Laptop hours	Problems sleeping	0.13	Mild sleep disruption link
	Problems with your eye	0.10	Mild link to eye strain
	Headaches	0.05	Weak headache connection
	Migraine issue	0.22	Moderate link to migraines
	Other body pain	0.25	Notable link to body pain

Summary of Findings and Interpretation:

The data reveals that spending more time on marketing devices shows small but noticeable connections with sleep problems, migraines, and body pain. While the link to headaches and eye issues is minimal, there is still some relationship to overall physical strain.

For mobile phone usage, we see mild connections to sleep problems, slight strain on the eyes, and minor headaches and body pain. These are weaker effects, suggesting that while mobile phones may contribute to these health challenges, the impact is not as strong.

Laptop use appears to be a bit more linked to health issues. The data shows moderate relationships to migraines and body pain, suggesting that working on laptops for long hours can lead to these concerns. Sleep problems and eye strain are also slightly linked to laptop use.

However, the findings highlight how extended use of digital devices, whether marketing devices, mobile phones, or laptops, can have small but meaningful effects on sleep, headaches, and physical discomfort. This suggests the need to balance screen time with healthy habits to maintain overall well-being.

In this present study, the majority of participants were young and unmarried, as evidenced by the collected data. Notably, unmarried students at the Higher Secondary Certificate (HSC) level exhibited a strong desire for economic independence, increasingly relying on mobile devices for digital marketing activities. The findings reveal a trade-off between empowerment and health risks, with statistical analysis indicating that while income levels remained modest, this pursuit of financial autonomy was prioritized. However, this economic gain is accompanied by significant physical and mental health challenges, including technostress, sleep disturbances, body pain, sedentary behavior, and social isolation, all attributable to digital entrepreneurship. Nevertheless, strategic interventions—such as judicious device usage, regular physical exercise, and scheduled work breaks—present viable solutions to mitigate these health adversities.

Conclusion

This study elucidates a descriptive analysis of young female students (aged 16-25) predominantly engaged in digital marketing for economic sustenance, highlighting the sector's popularity as a means of financial

independence, facilitated by mobile or laptop usage. However, this extensive involvement is concomitant with escalating health challenges, including sleep deprivation, migraines, headaches, body pain, and eye strain, emerging at an alarmingly young age and posing significant concerns, particularly for women with prolonged professional trajectories ahead. Concurrently, mental health is adversely impacted by technostress, cyberbullying, loneliness, and diminished family interaction, with a substantial proportion of participants expressing dissatisfaction with their health status. To mitigate these issues, the study advocates for enhanced digital literacy, regular physical activity, mental health support, reduced screen time, and improved sleep hygiene, alongside robust policies to combat cyberbullying and harassment. It underscores the imperative for collaborative efforts from government and policymakers to foster digital empowerment while safeguarding women's health, ensuring a balanced integration of technology and well-being in the entrepreneurial landscape.

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