Research

THE RELATIONSHIP BETWEEN SCREEN TIME AND EMOTIONAL QUOTIENT IN MEDICAL STUDENTS

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ABSTRACT

Background The use of gadgets, especially smartphones, is common among college students. The duration of smartphone usage in a day can be seen through the screen time records. High screen time records indicate high smartphone usage. Excessive use of smartphones has the potential to disrupt social interaction. Emotional Quotient (EQ) is very important in supporting social interaction. Emotional Quotient is a person's ability to express his feelings appropriately and effectively.
Objectives This research was conducted to know the relationship between screen time duration and EQ in college students.
Methods This research is an analytic observational study with a cross-sectional approach. Respondents in this study were students who met the inclusion and exclusion criteria. They were recruited using the consecutive sampling method. The duration of the screen time is obtained from the default smartphone application. Emotional Quotient was measured with the Trait Emotional Intelligence Questionnaire-Short Form (TEIQue-SF) questionnaire.
Results There were 90 respondents (male = 27 people; female = 63 people) with an average age of 19.4 + 0.69 years. Spearman's test showed a relationship between screen time duration and EQ ($p < 0.01$; $r = -0.97$).
Conclusions This study concludes that the duration of screen time is related to EQ, the higher the duration of screen time, the lower the EQ. Therefore, to prevent EQ deterioration, it is important to limit screen time.
Keywords: emotional quotient, screen time, students, EQ, TEIQue-SF

INTRODUCTION

In this modern era, gadgets are one of the tools that can facilitate users in carrying out social interactions and daily activities.[1] There are several forms of gadgets that are often found including laptops, computers, and smartphones. A person's daily smartphone use can be seen through a screen time record that shows the daily duration of smartphone usage.[2] Excessive screen time is defined as spending more than 2 hours daily exposure of electronic media devices.[1] In 2020 study conducted in India by Dwajani et al, it was found that adolescents with an age range between 18-24 years were categorized as having high screen time records if recorded more than 5 hours per day.[3] The tendency to use gadgets excessively and inappropriately will cause a person to act indifferent to his environment, this indifference can blunt the ability to empathize, express emotions appropriately, manage emotions, and all of those are aspects of emotional intelligence.[4] Excessive use of gadgets increases screen time, thereby also changing social interaction patterns by reducing direct social interaction and reducing the social skill aspect of emotional intelligence.[5]

The use of smartphones can affect emotional intelligence, causing social interaction disorders for the users.[6,7] Emotional intelligence or emotional quotient (EQ) is a person's ability to express their feelings appropriately and in an effective way.[8] In college students, EQ can affect many aspects of their college life. Good EQ makes students able to build relationships with others so as to improve their ability to work together in teams and solve problems related to their social relationships.[9] Students with low EQ tend to find it difficult to manage emotions so that it can lead to excessive anxiety, either in their social relationships or in their academic aspects.[10] Medical students will become doctors who need good EQ, so they can have good social interactions, especially in providing services to patients individually or when they have to solve a problem as a team involving others profession such as nurses.[11,12] The Covid-19 pandemic that occurred in 2019, changed most of the learning processes in college from offline to online.[13] Online learning has the potential to increase smartphone use. This prompted a study on the relationship between screen time duration and EQ in medical faculty students.

METHODS

This study used an analytic observational method with a cross-sectional approach. The sampling technique used was consecutive sampling. Respondents in this study were second year students of the medical faculty, aged more than 18 years, registered as active students in the semester when the research was conducted, had a smartphone with screen time access for the past 3 weeks. Respondents were excluded if they withdrew, did not submit a completed questionnaire, or took antidepressant / antianxiety drugs at the time of data collection. Informed consent was obtained before the start of data collection. Screen time duration was obtained from the built-in smartphone application. Emotional Quotient was measured with the Trait Emotional Intelligence Questionnaire-Short Form (TEIQue-SF). The TEIQue Short Form

questionnaire has been translated into Indonesian with Cronbach's alpha reliability test results of 0.87 and test results using confirmatory factor analysis showed that all question items were valid for assessing the level of emotional quotient.[14] Demographic data, screen time duration, and EQ were displayed descriptively or in the form of frequency distribution tables. Mean data are displayed as mean ± standard deviation. Normality test was conducted using Kolmogorov-Smirnov. The relationship between screen time and EQ was tested using the Spearman test with a significance level of $p<0.05$. This study has obtained ethical clearance from the UKDW Faculty of Medicine Health Research Ethics Commission with number: 1365/C.16/FK/2022.

RESULTS

This research was conducted in Yogyakarta. Data collection was carried out in March 2022. Of the 98 respondents who were willing to participate, 90 people met the inclusion and exclusion criteria. Data from these 90 people were analysed further. Table 1 below show the characteristic of respondents.

Table 1. Characteristics of Respondents (n=90)

Characteristics	Total (%)
Age (mean, SD)	19,4 ± 0,68
Sex	
Male	27 (30.0)
Female	63 (70.0)
Gadget Used	
Smartphone and Laptop	86 (95.6)
Smartphone and PC	2 (2.2)
Smartphone, Laptop, and PC	2 (2.2)
Applications Used	
Instant Messaging (LINE, WhatsApp, Instagram, MsTeams, and Zoom)	77 (85.6)
Unidentified	13 (14.4)
Emotional Quotient (EQ)	
Low (<119)	16 (17.8)
Mid (119-165)	56 (62.2)
High (>165)	18 (20.0)

independent T-test, there was no difference between the two (p=0.81; p>0.05). The mean EQ score of the respondents was 142.24 + 23.37. The mean EQ score for male respondents was 139.3 + 24.87 while for female respondents it was 143.3 + 22.81. The independent t-test showed no difference between the two scores (p=0.51; p>0.05). Respondents' scores were interpreted as low, medium, and high according to Azwar's categorization norms.[15] The mean screen time duration per EQ category is shown in Table 2.

Table 2. Screen Time Duration Based-on Emotional Quotient

Emotional Quotient (EQ)	Average of Screen Time
Low	13 hours 33 min
Mid	10 hours 20 min
High	6 hours 15 min

The normality test with Kolmogorov Smirnov showed that screen time data was not normally distributed (p < 0.05). Spearman test showed a relationship between screen time duration and EQ (p<0.01, r = -0.97).

DISCUSSION

The average duration of screen time use in this study was 10 hours and 5 minutes, higher than the results of research by Twenge and Campbell and Dwajani et al. Research conducted by Twenge and Campbell in the US in 2018 showed that the average duration of screen time in adolescents was 7 hours per day.[16] Dwajani et al conducted research in Canada in 2020 and showed that the average duration of screen time per day in adolescents aged between 18 and 24 years during the Covid-19 pandemic was 7-8 hours.[3,16] The higher average screen time duration may be caused by the Covid-19 pandemic. During the pandemic, many people are encouraged to rely on digital platforms. In university students, the Covid-19 pandemic has forced the learning process and socialization has turned online, leading to an increase in screen time.[13,17]

The use of smartphones with a longer duration can reduce social interaction. For a teenager, especially a student, direct social interaction is needed. In social interaction, a person will learn to understand other people's feelings, control their emotions, and practice expressing their emotions appropriately. The non-verbal language that occurs during these social interactions will later be useful when a teenager lives socially with his environment.[18]

Male and female respondents have the same average screen time duration. This is in accordance with Brown's research, which states that both genders are currently growing up together as a generation that is emerging as digital natives. Men and women use digital tools for a variety of daily purposes.[19] Previous research related to EQ with success in medical education showed the results that medical students have a low level of EQ, the difference with this study occurred due to differences in the selection of subjects of student academic years.[20] The average EQ score obtained was 142.24. In a study by McCallum with adolescent subjects aged 16-18 years, the average score of EQ in adolescents was 127.[21] The difference between the results obtained can be caused by differences in the age of the subjects used. Emotional quotient is a component of a person's psychology that can be developed and trained. Higher scores are obtained with age and are influenced by more experience and learning experienced in individuals who have older ages.[22]

Based on the assessment of EQ, it is found that female subjects have higher EQ than men, but statistically insignificant. In women, it is found that the components of EQ are better in the aspects of emotionality and self-control, while in men, the results are more dominant in the aspects of well-being and sociability. This result is in accordance with Meshkat and Nejati's research which shows that there is no specific relationship between EQ scores and gender.[23]

The thing that distinguishes between the two is based on the components of EQ. In women, higher scores were seen in the components of empathy, interpersonal relationships, self-esteem, and perception of self and others' emotions. However, men have better results on the components of EQ in the aspects of self-confidence, stress tolerance, optimism, adaptability and have better emotional regulation than women.[24]

In this study, the EQ category is divided into 3 namely low, medium, and high. The results showed that in general had a moderate level of EQ. Someone in the medium category basically has EQ but is not yet optimal. This can be caused by the possibility of someone who is still in the process of improving their EQ. A person with a high category indicates that the person already has EQ which can be seen through his ability to recognize emotions, manage emotions, motivate himself, and understand the emotions of others, while low EQ shows a lack of ability to understand and express one's own emotions, build relationships with others and lack of empathy.[25] Emotional quotient involves various structures in the human brain, the major role is acquired from the three main structures in managing emotions, namely the amygdala, insula and ventromedial prefrontal cortex (vmPFC).[26]

Screen time duration is related to EQ, the higher the screen time duration, the lower a person's emotional intelligence. Research conducted by Desiningrum in 2017 states that there is a negative and significant relationship between the use of gadgets and adolescent EQ.[4] People with high screen time tend to spend more time with smartphones so they have a lower EQ. This result is in accordance with research conducted by Twenge and Campbell in 2018 which shows that increasing the duration of screen time to exceed 7 hours per day will double the likelihood of being diagnosed with psychological disorders related to EQ.[16]

Prolonged and continuous use of smartphones can affect the work of the brain, especially in the structure of the prefrontal cortex (PFC). The medial part of the PFC has a major function in emotion regulation related to top-down modulation of limbic system control. The corticolimbic regulatory function will be impaired when in a state of overuse and fatigue. This will affect the decrease in the functional relationship between the medial PFC and the amygdala. This decrease will result in damage to the PFC which then causes a decrease in social function, interpersonal interactions, and mood swings that tend to be abnormal so that it affects the management of emotions in a person.[27,28] When the body receives exposure to chronic stressors, there will be a disturbance in the regulation of mono directional basolateral amygdala (BLA) towards the prefrontal dorsomedial cortex (dmPFC), this condition causes amygdala hijack. Chronic stressors also cause dendrite shrinkage in the mPFC and decrease brain derived neurotrophic factor (BDNF) so that synapses in the PFC and hypothalamus are reduced.[29]

In addition to affecting the limbic system, excessive smartphone use can also increase physiological reactions to emotional stimuli. The physiological impact occurs with an increase in sympathetic reactions to an unpleasant stimulus received. In this state, the body will react by increasing heart rate and blood pressure, pupil dilation, and decreased mood adjustment caused by emotional stress.[28]

CONCLUSION

There is a significant negative relationship between screen time duration and EQ in second-year students of the Faculty of Medicine. The higher the duration of screen time, the lower the EQ, and vice versa.

CONFLICT OF INTEREST

There is no conflict of interest in the scientific article written.

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