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TechWell

Report on Smartphone and Technology Addiction in Türkiye

Assoc. Prof. Dr. Adnan Veysel ERTEMEL
Dr: Zehra ATİK
Rofaida BENOTOSMANE

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1.Introduction

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The digital transformation of modern societies has significantly reshaped the behavior, lifestyle, and mental health of children and adolescents. Smartphones, with their wide range of functions, have become not only essential communication tools but also powerful platforms of entertainment, learning, and socialization. However, this proliferation has brought with it an **emerging concern**: behavioral addictions associated with excessive and uncontrolled digital media use. Among them, smartphone addiction is increasingly becoming a **global public health issue**, particularly among adolescents.

A variety of individual and environmental risk factors contribute to the development of digital addiction. Research consistently identifies the family environment as a key determinant: low family cohesion and warmth, high conflict levels, and poor parent-child communication increase the likelihood of problematic internet use (Bickham, 2021). A lack of parental control and guidance allows children unrestricted internet access, thereby raising their risk of addiction. A**ccording to UNICEF, the widespread availability of mobile devices often enables unsupervised internet use among children, exposing them to harmful content, cyberbullying, and potential abuse (UNICEF: Make the digital world safer for children)**. At the individual level, personality traits and mental health conditions also play a significant role. Adolescents with high impulsivity and low self-regulation are more likely to develop technology addiction. Likewise, those with aggressive tendencies, social anxiety, depressive symptoms, or psychiatric comorbidities such as ADHD may use the internet excessively as a form of escape or emotional relief (Bickham, 2021).

Social and cultural factors further exacerbate the problem. If excessive use of online games or social media becomes the norm within peer groups, adolescents may increase their usage to conform. The lack of comprehensive digital literacy and online safety education in schools limits adolescents' capacity to recognize and manage online risks. As noted by WHO Europe Director Dr. Hans Kluge, most countries still fall short in preparing young people for the rapidly evolving digital environment and in equipping them with the necessary digital habits and safety skills (Boniel-Nissim et al.,2024). Ultimately, the key factors enabling digital addiction in adolescents include constant access to devices, unsupervised usage, age-specific impulsivity, and exposure to limitless digital stimuli. The presence of these risks renders some adolescents more vulnerable to falling into patterns of compulsive technology use and dependency.

In Turkey, various studies using internationally recognized scales such as the **Smartphone Addiction Scale (SAS), its short form (SAS-SV), the Fear of Missing Out Scale (FoMO), the Internet Gaming Disorder Scale (IGDS9-SF), and the Bergen Social Media Addiction Scale (BSMAS)** have revealed concerning trends. A meta-analysis of 71 Turkish studies (Kurt & Avcı, 2020) found that approximately 13% of adolescents meet the criteria for internet addiction, with variations depending on the region, socioeconomic status, and diagnostic tool. Among high school students, the prevalence was found to be around 9%, while it reached 13% among university youth. These findings mirror global patterns, where digital addiction has become increasingly visible across educational levels and age groups.

Avcı's (2021) meta-analysis, which synthesized data from 38 studies and over 20,000 participants between 2000 and 2018, estimated that 5% of individuals in Turkey meet the criteria for clinical internet addiction, while 26% fall into a high-risk "potentially addicted" category. Adolescents (12–18 years) were particularly vulnerable, with 28% classified as potentially addicted. Prevalence rates have increased notably since 2013, paralleling the widespread diffusion of internet technologies in Turkey. Higher educational levels and certain regions, particularly Central Anatolia, exhibited higher addiction rates, suggesting socioeconomic and infrastructural disparities in digital risk exposure.

More recent empirical evidence also highlights a growing concern over technology and internet addiction among Turkish adolescents, revealing both behavioral and psychosocial dimensions of the issue. A large-scale field study by Yılmaz and Özkan (2024), involving **1,971 high school students** across **12 NUTS** regions in Turkey, found that excessive **technology use (EUT)** and **social media disorder (SMD)** are significantly prevalent and linked to various individual and social factors. The study showed that female students, those with psychiatric diagnoses, and students attending private or science high schools exhibited higher levels of digital addiction. Time spent on social media and streaming platforms was a major determinant, with adolescents using these platforms for more than three hours daily demonstrating significantly higher EUT and SMD scores. The strongest negative predictor for both behaviors was low self-control, while avoidant and impulsive coping strategies were positively associated. These findings underscore the importance of psychosocial interventions, including self-regulation training and enhanced family and school support.

More importantly, in-depth surveys and national-level data show that digital media engagement starts at an increasingly young age. Recent data from the **2024 Information and Communication Technology (ICT) Usage Survey Among Children**, released by the **Turkish Statistical Institute (TÜİK)**, reveal a marked increase in digital engagement among children aged 6–15 in Turkey. Internet usage rose from **82.7%** in 2021 to **91.3%** in 2024, with **97.4%** of children reporting regular use. A majority of children spend approximately two or more hours online daily, particularly on weekends, with video consumption, educational activities, and gaming being the most frequent online behaviors. Social media use is also widespread, reaching **66.1%**, with platforms like YouTube, Instagram, and TikTok dominating across age groups. Notably, **76.1%** of children now use mobile or smartphones, and among adolescents who reported using social media, **97.9%** said they use it regularly (at least once a week), while nearly half of smartphone users checked their devices every 30 minutes. The report highlights growing concerns around overuse, as **40.1%** of children play digital games longer than planned and **34.4%** report reduced reading due to extended screen time. Figures even higher among the 11–17 age bracket. Furthermore, nighttime use (between 23:00 and 04:00) is alarmingly frequent among adolescents, disrupting sleep and negatively impacting school performance, concentration, and mental health. These findings underscore the deep integration of digital technologies into children's daily routines and raise important questions regarding digital well-being and self-regulation.

The accumulation of this data signals a significant risk to adolescent well-being in Turkey. Young people not only face prolonged screen exposure but also increasing **psychological, emotional, and social dependence** on digital interactions. Turkish studies align with findings from the UNICEF, and OECD that show a direct link between digital overuse and symptoms of anxiety, depression, attention problems, and social isolation. Moreover, digital risk behaviors such as oversharing, cyberbullying, and validation-seeking are increasingly prevalent in this age group.

This report, conducted within the scope of the European Union Erasmus+ project, aims to examine the current situation, trends, risk factors, and consequences of smartphone addiction in Turkey. Additionally, it will evaluate Turkey's policies and strategies in combating this problem and its alignment with international developments (e.g., the EU Digital Services Act).

2.Context and Trends in Türkiye

The EU is placing more responsibility on digital platforms to protect children from online addiction and requiring the creation of safe, appropriate content.

According to the *Household ICT Usage Survey* dated August 24, 2024, internet usage among individuals aged 16–24 has reached near-universal levels at 96.5%—95.6% among females and 97.4% among males. The dramatic increase from 26.6% in 2004 illustrates not only the rapid spread of digital technologies but also raises concerns that internet usage may be shifting from a necessary tool to a potential source of addiction (**Household ICT Usage Survey**). In particular, social media use, digital gaming, and the constant state of being online have made it increasingly difficult for young people to disconnect—contributing to various social, psychological, and academic impacts. The narrowing gender gap in digital engagement further suggests that addiction risks now extend across the entire youth population. This landscape underscores the growing importance not only of digital literacy but also of digital balance and conscious use.

During the COVID-19 pandemic, screen time and online activity in Turkey increased significantly due to remote learning and the need for digital social interaction. Since 2020, youth exposure to digital media has reached unprecedented levels. In sum, digital media use among adolescents aged 11–17 in Turkey is now nearly universal, and tendencies toward excessive use—potentially qualifying as digital addiction—are on the rise. Official statistics indicate that a substantial portion of this age group now spends a major part of their daily lives engaged with smartphones and social media.

The challenges posed by digital addiction among adolescents are both physical and psychosocial. Excessive screen use, particularly during adolescence, has been shown to negatively affect sleep patterns and psychological well-being. According to the World Health Organization's 2024 report on adolescent health in Europe, adolescents who engage in problematic social media use report lower levels of mental and social well-being and experience higher rates of depression and anxiety. Furthermore, such usage shortens sleep duration and delays bedtime, with potential adverse effects on general health and academic performance. The WHO report also associates excessive social media use with increased risk of depression, exposure to peer bullying, anxiety, and decreased academic achievement (WHO, Child and adolescent health in Europe).

From a physical health perspective, continuous smartphone and computer use can lead to ergonomic problems such as poor posture, eye strain, and hand-wrist discomfort, while promoting a sedentary lifestyle that increases the risk of obesity. Experts emphasize that sleep disturbances are a key risk: adolescents who stay on screens late into the night experience suppressed melatonin production and poorer sleep quality, creating a cycle of fatigue that persists throughout the day. Academic and social development may also suffer; adolescents who spend most of their non-school hours in front of screens may show decreased attention span, lower academic performance, and reduced face-to-face social interaction. Research conducted in Turkey has found that high school students who engage excessively in digital gaming tend to show higher levels of aggression and violent tendencies, along with lower emotional regulation skills (**National Strategy Document and Action Plan for Combating Behavioral Addictions 2024-2028**). A significant positive correlation has also been observed between digital game addiction and anger management problems or bullying behaviors in adolescents, highlighting the detrimental impact of digital addiction on behavioral and emotional health (National Strategy Document and Action Plan for Combating Behavioral Addictions 2024-2028; 2024).

In recent years, Turkey has developed a series of policy documents and multi-stakeholder programs to address the growing issue of digital addiction among youth. Established by a Presidential decree in 2019, the High Council for Combating Addiction has brought together various ministries to coordinate national responses not only to substance addiction but also to behavioral addictions, including internet, gaming, and gambling. One of the most significant roadmaps created under this initiative is the National Strategy Document and Action Plan for Combating Behavioral Addictions 2019–2023 (**2019**), prepared by the Ministry of Health. This strategy defines one of its core goals as "ensuring the conscious, safe, and effective use of technology and the internet, and preventing excessive and harmful use."

The strategy outlines key objectives such as raising digital awareness across society—especially among children and youth—reducing overuse, identifying at-risk individuals early, and supporting scientific research. It assigns action items to relevant institutions, including the Ministry of National Education (MoNE), Ministry of Health, Ministry of Family, and Ministry of Youth and Sports. Planned actions include integrating "conscious technology use" education into schools, establishing counseling centers in each province, and monitoring progress through addiction-related data collected via MoNE surveys and partnerships with the Turkish Green Crescent Society (Yeşilay).

The Ministry of National Education has also revised educational policies and curricula to promote digital skills while mitigating associated harms. As part of the 2018 curriculum update, topics such as safe internet use, cyberbullying, and technology addiction were incorporated into the "Information Technologies and Software" course. Awareness seminars on technology addiction have been institutionalized as part of school counseling and psychological support services. In its 2020 education vision documents, MoNE emphasized the importance of teaching digital citizenship and safe technology practices. During the COVID-19 pandemic, guidance on balanced internet use was provided to students and parents through the EBA distance learning system. Furthermore, in 2019 MoNE has partnered with Yeşilay to implement the Turkey Addiction Prevention Training Program (TBM) in schools which is a comprehensive educational initiative that includes content on technology addiction in addition to tobacco, alcohol, and substance addiction. Since 2019, TBM content has been disseminated nationwide at the school level. A dedicated "Addiction Prevention" library has been created on the EBA (Education Information Network) platform, making videos, lesson plans, and animations prepared by the Green Crescent accessible to students and teachers (Addiction Prevention Library). For instance, the animated educational video titled "Technology Addiction", designed for middle school students, explains the harms of technology addiction in a language suitable for adolescents (**EBA-Technology Addiction**). For primary school students, animations such as "Excessive Internet Use" emphasize the importance of using technology for the right purpose and duration (**Internet Excessive Use (Primary School)**). TBM includes age-appropriate materials, and teachers are encouraged to integrate them into their lessons. It has been reported that this program has helped raise awareness about technology addiction among hundreds of thousands of students in classroom settings, and information has also been provided to parents. (Addiction Prevention Library).

> ***Awareness seminars on technology addiction have been institutionalized as part of school counseling and psychological support services***

The proportion of students receiving conscious technology use education is now tracked as a performance indicator, with the 2019 strategy aiming to increase this rate from 30% to 50% by 2023. The new action plan (National Strategy Document and Action Plan for Combating Behavioral Addictions 2024-2028; 2024) sets clear targets for addressing behavioral addictions among adolescents. One key objective is to reduce the amount of time spent on social media by individuals aged 14 to 19 by 20%, aiming to mitigate the psychological and social risks associated with excessive online engagement. Another important goal is to increase the rate of technology literacy education among students to 50%, ensuring that young people develop the skills necessary for the conscious, safe, and productive use of digital tools. Additionally, the plan aims for a 20% reduction in the use of the internet for gambling purposes, particularly to combat the growing risk of online betting and gaming addiction among youth.

"The new action plan (National Strategy Document and Action Plan for Combating Behavioral Addictions 2024-2028; 2024) sets clear targets for addressing behavioral addictions among adolescents."

Turkey's Information and Communication Technologies Authority (ICTA/BTK) and other regulatory bodies have implemented additional measures to protect children online and prevent digital addiction. Since 2011, the Safe Internet Service has offered parents free filtering options. BTK's "Safe Internet Center" works to raise awareness and shield children from harmful online content. According to the OECD's 2020 report Protecting Children Online, Turkey is among the countries that offer content filtering through internet service providers. Users opting for the "Safe Internet Service" can restrict access to age-appropriate content. BTK also organizes annual "Safer Internet Day" events to raise public awareness. Safer Internet Day is celebrated every February with the participation of ministries, NGOs, and tech companies.

On this day, various activities are organized in schools, such as competitions, panels, and conferences. For example, during the 2021 Safer Internet Day, tens of thousands of students participated in online events themed "Safety in the Digital World." Campaigns like "Don't Be a Cyberbully – Be Aware" have raised awareness among adolescents about cyberbullying and excessive internet use (**Cyber Bullying Awareness Campaign**). While recent social media regulations primarily address disinformation and data privacy, they also aim to restrict youth exposure to harmful online content—such as by requiring platforms to appoint local representatives and promptly remove illegal content. The Safe Internet Center, established under the coordination of the BTK operates as part of the EU-supported Better Internet for Kids initiative. Through websites like **www.guvenliweb.org.tr**, the center provides educational materials for children, youth, and parents. The Safe Internet mobile app and helplines offer technical support to families. These initiatives strengthen the preventive aspect of combating technology addiction.

The Ministry of Health has developed dedicated health services to tackle technology addiction. In line with the 2019–2023 Strategy, Behavioral Addiction Clinics have been established in several psychiatric hospitals. For instance, Istanbul's Erenköy Mental Health and Neurological Diseases Hospital now offers specialized outpatient services for internet, gaming, and gambling addiction (Erenköy Mental Health and Neurological Diseases Hospital). These clinics provide adolescents and their families with counseling, psychotherapy, and medical treatment as needed. The Ministry also conducts public awareness campaigns through the General Directorate of Public Health, distributing brochures and guides on digital well-being. Similarly, the Ministry of Family and Social Services incorporates digital parenting themes into its training programs for parents. Initiatives such as the Family Education Programs aim to equip parents with digital parenting skills—such as monitoring children's internet activity, setting usage limits, and promoting offline alternatives. In addition, the 5th International Education Forum, held on May 14, 2020, by the Turkish Education Association's think tank TEDMEM, and attended by Minister of National Education, who delivered the opening speech, focused on the theme of "Digital Obesity" and aimed to raise awareness about the growing impact of excessive digital exposure, particularly in the post-COVID-19 era (**TEDMEM-Digital Obesity**).

Cooperation between civil society and the government has also been institutionalized. With over a century of history, the semi-public NGO Yeşilay is a key partner in the national effort against technology addiction. Under Yeşilay's guidance, prevention programs are implemented in schools (e.g., TBM), and its Yeşilay Counseling Centers (YEDAM) provide psychosocial support to youth struggling with digital addiction (**YEDAM**). These centers operate in coordination with the Ministries of Health and Family, offering free therapy and rehabilitation services. Post-2019, the number of YEDAM centers has expanded, aiming to scale up treatment capacity for young individuals. Additionally, in 2020, the General Directorate of Security under the Ministry of Interior launched the "Siberay" program within its Cybercrime Department. The goal of Siberay is to promote a culture of safe internet use and protect children and adolescents from online risks. Public service announcements and social media campaigns prepared under the program alert families about excessive screen time and encourage youth to reflect on their own usage habits with messages like "Are You Aware of the Time You Spend Online?" Police officers deliver school seminars to raise awareness about technology addiction. In 2021, volunteer officers from Siberay held training sessions on cyber security and addiction in hundreds of schools. Through its social media channels, Siberay regularly shares digital detox tips, guidance for parents, and safe gaming advice. (**https://en.siberay.com/**).

> ***"Cooperation between civil society and the government has also been institutionalized. This cooperation is turning into an important fight against technology dependency."***

Additionally, Turkey has taken significant steps in recent years regarding the regulation of digital platforms and the protection of children in the online environment:

· **Law No. 5651** on the Regulation of Publications Made on the Internet and Combating Crimes Committed Through These Publications: With the amendments made in 2020 and 2022, various obligations have been imposed on social media companies and content platforms. These obligations include requiring social network providers with a certain number of daily access to have a representative in Turkey, removing illegal content within 24 hours, and storing user data in Turkey.

· **Law No. 7418:** With this amendment made in 2022, social network providers are required to take the necessary measures to provide separate services for children. This may include measures such as social media platforms providing a safer interface or content filter for child users, offering age-appropriate features.

3.Literature Review

Smartphone addiction is recognized as a subtype of behavioral addiction, defined by excessive, uncontrolled, and compulsive use of mobile phones that disrupts an individual's daily functioning and psychological well-being.

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Smartphone addiction is recognized as a subtype of behavioral addiction, defined by excessive, uncontrolled, and compulsive use of mobile phones that disrupts an individual's daily functioning and psychological well-being (Kwon et al., 2013). Although widely acknowledged in academic literature, smartphone addiction has not yet been recognized as a clinical diagnosis in the Diagnostic and Statistical Manual of Mental Disorders (DSM-5), which has led to the frequent interchangeable use of terms such as problematic smartphone use (PSU) and smartphone dependency (SD) (Tossell et al., 2015; Laurence et al., 2020; Yang et al., 2019; Fryman & Romine, 2021; Akıncı & Durmuş, 2024). Regardless of the terminology, studies agree on its detrimental impact on individuals' mental health, social relationships, sleep quality, and overall well-being (Wang & Lee, 2020; Akıncı & Durmuş, 2024). One of the most commonly used instruments to assess smartphone addiction is the Smartphone Addiction Scale – Short Version (SAS-SV), developed by Kwon et al. (2013), which remains widely adopted across different cultural contexts, including Turkey.

In Turkey, smartphone and social media use is highly prevalent, with recent national statistics indicating that approximately 95% of the population owns smartphones and 73% actively engages in social media platforms (MOBISAD, 2023). In light of this, numerous Turkish studies have examined the risk factors and correlates of smartphone addiction, especially among young people. **Özmen et al., (2023), in a study conducted with medical students, reported that 34.41% of participants were classified as being at risk of smartphone addiction according to SAS-SV scores**. Furthermore, their findings underscored the association between smartphone addiction and poor sleep quality, depression, and anxiety symptoms. These results are echoed by another study that revealed similar links between smartphone overuse and elevated psychological symptoms (Özmen et al., 2023).

Özmen et al., (2023), in a study conducted with medical students, reported that 34.41% of participants were classified as being at risk of smartphone addiction according to SAS-SV scores

Çelik and Ataş (2023), in their study among university students, emphasized **the role of excessive daily smartphone usage and specific behavioral patterns—such as compulsive checking and use during social interactions—as significant predictors of smartphone addiction**. They also highlighted how cultural and socio-economic contexts affect smartphone engagement; for instance, students in urban settings showed higher rates of smartphone and social media use compared to their rural counterparts, largely due to differences in internet infrastructure and cultural habits. However, both urban and rural youth were found to be equally vulnerable to the emotional and psychological pressures created by continuous exposure to social media content, suggesting that geographic location may shape the form, but not the intensity, of smartphone-related vulnerabilities (Çelik & Ataş, 2023).

The COVID-19 pandemic further accelerated these patterns of problematic use. **Molu et al. (2023) conducted a study in Central Anatolia with adolescents, where 87.2% of participants reported an increase in their smartphone usage during the pandemic.** Importantly, daily smartphone usage exceeding 90 minutes was found to negatively affect adolescents' sleep quality, leading the authors to call for early intervention programs to mitigate long-term risks. Similarly, Sevim, Gümüş, and Kızıl (2024) observed that excessive consumption of digital video platforms—particularly YouTube—was associated with elevated Body Mass Index (BMI) scores and heightened emotional appetite among adolescents, suggesting that digital overexposure may have both psychological and physiological consequences.

The rising dependency on smartphones is often intertwined with the increasing use of social media platforms, which serve not only as tools for communication and entertainment, but also as significant contributors to **emotional and cognitive overload**. As Kuss and Griffiths (2017) and Al-Menayes (2016) argue, young users frequently report using social media to maintain social connectivity and monitor peers, often leading to compulsive checking behaviors. Social media also plays a critical role in the dissemination of misinformation and contributes to cognitive fatigue, a phenomenon especially evident in moments of national crisis (Alutaybi et al., 2020). For example, during the 2023 Kahramanmaraş earthquake, information overload and disinformation spread through social media channels contributed to widespread panic and confusion among the public (2020; Aydın, 2023).

Erdem & Sezer Efe (2022) conducted a study with 500 high school students in Central Anatolia, reporting a mean SAS score of 27.8 (±11.5), which corresponds to a moderate level of addiction. Similarly, Kaya (2024) surveyed 406 students in Mardin, Southeast Turkey, and observed average item scores between 2–3 out of 6, again pointing to a moderate addiction risk. Both studies showed that nearly all participants owned a smartphone and used it daily for 3.5 to 4 hours. Gender differences were not significant in Erdem & Sezer Efe's study, yet prior research indicates that girls tend to use smartphones more for social interactions. The same study found that smartphone addiction scores were positively but weakly correlated with loneliness and negatively with peer conflict, suggesting that excessive use may both buffer loneliness and reduce interpersonal tension.

The link between smartphone addiction and academic outcomes was investigated by Güçlü et al. (2024) in a study of 1,959 high school students in Bursa. Higher SAS scores correlated with lower grade point averages and poor sleep quality, indicating both direct and indirect academic consequences. Additionally, item-level network analyses identified attentional issues (e.g., distraction, trouble focusing) as central complaints among adolescents (Kaya, 2024).

The concept of social media addiction (SMA) has emerged as a related concern, particularly among adolescents and young adults. Early studies in this domain focused on Facebook addiction, with the Bergen Facebook Addiction Scale (BFAS) developed by Andreassen (2012) serving as the primary assessment tool (Andreassen, 2012; Balcı & Tiryaki, 2014; Çam & İşbulan, 2012). In more recent years, the Bergen Social Media Addiction Scale (BSMAS), also developed by Andreassen, has become a preferred instrument for assessing broader patterns of SMA across platforms. BSMAS has been validated for Turkish adolescents (Demirci, 2019) and shows high reliability ($\alpha = 0.86$). Demirci's study confirmed a single-factor structure and revealed positive correlations between BSMAS scores and symptoms of depression and anxiety. Sevim, Gümüş, and Kızıl (2024) demonstrated that BSMAS scores predicted outcomes on the Emotional Appetite Questionnaire (EMAQ-P), indicating that problematic social media use is associated with maladaptive eating behaviors and possibly emotional dysregulation. Bingöl, Sarman & Çiftçi (2024) conducted a research with of 1,009 adolescents and found moderate social media addiction levels, with girls scoring significantly higher than boys.

Similarly, Sarıtaş et al. (2024), in a sample of 400 high school students in Konya, noted that nearly half of participants exhibited problematic use, again with elevated scores among girls. Structural equation modeling showed that daily time spent on social media predicted both addiction and appearance-related consciousness.These findings highlight the complex interaction between digital media use and emotional health.

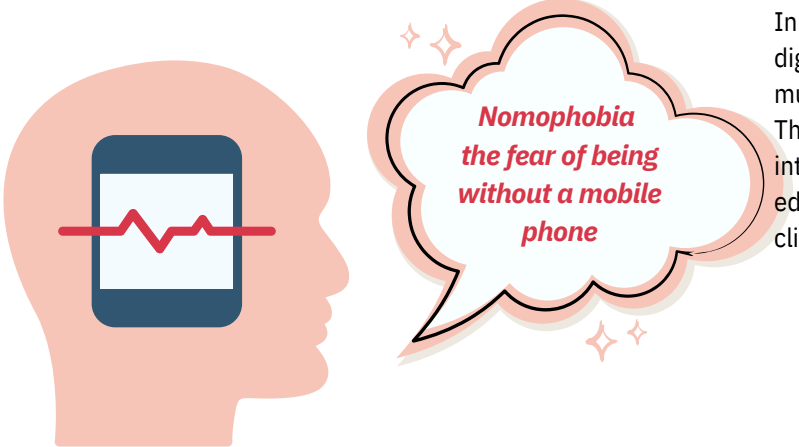
A recurring psychological mechanism underlying both smartphone and social media addiction is the fear of missing out (FoMO), described by Przybylski et al. (2013) as a pervasive anxiety that others might be having rewarding experiences from which one is absent. Multiple Turkish studies have confirmed a strong positive correlation between FoMO and problematic smartphone use. For instance, Gökler et al. (2016), Gökçearslan et al. (2023), and Taş and Balcı (2024) found that adolescents and university students with high FoMO scores were significantly more likely to report symptoms of smartphone addiction. Kartol & Peker (2020), studying 517 high school students in Erzurum, found that FoMO was more pronounced among girls and correlated positively with anxiety, but not with depression. Talan, Doğan, and Kalinkara (2024) further illustrated how FoMO leads to phubbing behaviors—ignoring others in favor of smartphones—which in turn impairs the quality of face-to-face communication and social relationships. Sarıtaş et al. (2024) confirmed that FoMO significantly increased social media addiction, with boredom playing a mediating role. In another study, Tunç-Aksan & Akbay (2019) found that FoMO, combined with low academic self-efficacy, predicted 30% of the variance in social media addiction among adolescents. Girls consistently showed higher FoMO levels, suggesting gendered vulnerabilities in digital anxiety and compulsive use

A recurring psychological mechanism underlying both smartphone and social media addiction is the fear of missing out (FoMO), described by Przybylski et al. (2013) as a pervasive anxiety that others might be having rewarding experiences from which one is absent.

Another recent study by Kovan, Yıldırım, and Gülbahçe (2024) explored the mediating roles of self-control and personal responsibility in the relationship between FoMO and SMA among Turkish university students. Using a sample of 256 students, the authors found that low self-control and diminished sense of responsibility amplified the effects of FoMO on SMA, leading them to recommend psychoeducational programs that promote self-regulation and healthy media consumption habits among youth. These interventions are particularly important in the context of rising academic and social stressors in university environments.

In parallel with SMA, Internet Gaming Disorder (IGD) has gained attention in both international and Turkish scholarship. Although IGD is included in the DSM-5 as a condition requiring further study, its diagnostic criteria remain controversial, with debates centering on the distinction between excessive gaming and pathological use (American Psychiatric Association, 2013; Király et al., 2014; King et al., 2013). In Turkey, Örnek and Gündoğmuş (2022) conducted a study with university students and found that both smartphone addiction and IGD were linked to unhealthy eating habits and increased risk of obesity. Interestingly, they reported no direct correlation between smartphone addiction and IGD, suggesting that these behavioral addictions may stem from different motivational and cognitive profiles.

Nomophobia—the fear of being without a mobile phone—is another emerging issue, measured using the Nomophobia Questionnaire (NMP-Q). Turkish adaptations (Yıldırım & Correia, 2015) have been widely used in adolescent research. Eren et al. (2020) found that 100% of a sample of 307 students in Istanbul exhibited at least mild nomophobia; 45.6% had moderate, and 5.9% had severe levels. Terzi et al. (2024), in a larger sample of 719 high school students, reported similar distributions: 44.9% moderate and 14.8% severe nomophobia, with girls and lower-grade students (9th–10th grades) scoring higher. Usage patterns—especially more than two hours per day, social media reliance, and checking phones immediately after waking—were all significant predictors of higher nomophobia.



Teker & Yakşi (2021) added that 65.7% of adolescents with high nomophobia also had poor sleep quality, increasing the risk of academic underperformance. Despite this, socioeconomic status and parental education did not appear to significantly influence nomophobia levels, suggesting the pervasiveness of this digital dependency across all segments of Turkish society.

To understand the broader psychological implications of digital addiction, self-report instruments such as the Strengths and Difficulties Questionnaire (SDQ) are commonly employed. The SDQ, developed by Goodman (2001), includes scales for emotional problems, hyperactivity, conduct issues, peer relationships, and pro-social behavior. While the SDQ has shown acceptable levels of reliability and validity in Turkish samples (Guvenir et al., 2008; Arslan, 2021), some studies have questioned its sensitivity and predictive power. For instance, a study by Alpaslan, Koçak, and Avcı (2016), which involved 487 adolescents and employed tools like the Children's Depression Inventory (CDI), Multidimensional Scale of Perceived Social Support (MSPSS), and UCLA Loneliness Scale, found that 26.6% of the sample exhibited significant depressive symptoms. Predictors of depression varied by gender: hyperactivity and conduct problems were more prominent in males, while emotional symptoms and loneliness were more common among females. Family support and pro-social behavior served as protective factors, particularly for girls.

In a related study, Aker, Şahin, Sezgin, and Oğuz (2017) examined psychosocial predictors of smartphone addiction in a university sample of 494 students using SAS-SV, the Flourishing Scale, and the General Health Questionnaire. Their results indicated that higher levels of depression, anxiety, and insomnia were associated with greater smartphone addiction. Moreover, lower levels of familial support and psychological flourishing emerged as significant risk factors, emphasizing the need to investigate smartphone addiction across diverse demographic groups and educational levels.

In conclusion, Turkish studies collectively demonstrate that digital behavioral addictions in adolescents manifest across multiple domains—social, emotional, academic, and health. The data underscores the need for multidimensional interventions, school-based mental health support, family education, and nationwide monitoring tools that reflect both clinical insight and local sociocultural dynamics.

4.Methodology

4.Methodology

Data were collected through an online survey administered to secondary school students aged 15 to 17 in Istanbul. The survey was conducted in collaboration with participating schools, and participation was voluntary and anonymous. A total of 335 students completed the survey. Data were cleaned and analyzed using SPSS and R statistical software packages.

The sample included 335 adolescents (mean age approximately 16), with an even distribution across age groups (15, 16, and 17). Gender distribution was also fairly balanced. Most participants were enrolled in public schools. Key demographic variables collected included gender, age, parental education and employment status, number of siblings, and academic performance.

The study utilized five validated psychological and behavioral scales:

1. **Smartphone Addiction Scale – Short Version (SAS-SV)**
2. **Bergen Social Media Addiction Scale (BSMAS)**
3. **Fear of Missing Out Scale (FOMO)**
4. **Internet Gaming Disorder Scale – Short Form (IGDS9-SF)**
5. **Strengths and Difficulties Questionnaire (SDQ)**

SAS, BSMAS, and IGDS9-SF are widely used tools for assessing addictive behaviors related to smartphones, social media, and gaming, respectively.

All scales were selected due to their established psychometric reliability and their relevance to the psychological and behavioral dimensions of adolescent digital engagement. **SAS**, **BSMAS**, and **IGDS9-SF** are widely used tools for assessing addictive behaviors related to smartphones, social media, and gaming, respectively. The FOMO scale captures the anxiety associated with digital exclusion. The SDQ measures emotional and behavioral difficulties. Collectively, these instruments allow for a comprehensive assessment of adolescents' digital habits and psychological well-being.

To evaluate the severity of risk and categorize adolescents into meaningful risk groups, two primary classification approaches were applied: ROC-based and quartile-based methods.

- **ROC-Based Classification: Receiver Operating Characteristic (ROC) curve analysis** was used to determine cutoff values that maximize sensitivity and specificity for each scale. These empirically derived thresholds allowed for the identification of high-risk individuals in a statistically informed way, aligning with prior literature and clinical relevance.
- **Quartile-Based Classification:** Complementing the ROC analysis, scores were also categorized using percentile ranks. Students were divided into four quartiles based on their total scores, allowing for a descriptive classification into mild, moderate, high, and severe risk groups. This approach helped illustrate distributional tendencies across gender and age groups, particularly for subgroup analyses.

5.Survey Results

5.1. Statistical Analysis of the Collected Data

Smartphone Addiction Scale (SAS-SV)

· **Descriptive Statistics:** Total scores ranged from 10 to 60, with a mean of 25.47 (SD = 9.05).
· **Reliability:** Cronbach's alpha = 0.85; Guttman's Lambda-6 = 0.87; Omega Total = 0.89; Omega Hierarchical = 0.62.
· **Exploratory Factor Analysis:** KMO = 0.867; Bartlett's Test: $\chi^2 = 1229.95$, df = 45, $p < 0.001$. Two components extracted, explaining 56.98% of variance.
· **Confirmatory Factor Analysis (CFA):** Single-factor model: CFI = 0.807; TLI = 0.752; RMSEA = 0.141; SRMR = 0.083. Bifactor model: CFI = 0.988; TLI = 0.972; RMSEA = 0.048; SRMR = 0.023. Bifactor structure shows superior model fit.

Fear of Missing Out (FOMO)

· **Descriptive Statistics:** Total score mean = 27.17 (SD = 7.69).
· **Reliability:** Cronbach's alpha = 0.82; Guttman's Lambda-6 = 0.85; Omega Total = 0.87; Omega Hierarchical = 0.67.
· **Exploratory Factor Analysis:** KMO = 0.806; Bartlett's Test: $\chi^2 = 1144.96$, $p < 0.001$. Three components extracted, explaining 64.53% of variance.
· **CFA: Single-factor model:** CFI = 0.711; TLI = 0.629; RMSEA = 0.166; SRMR = 0.101. Bifactor model: CFI = 0.960; TLI = 0.906; RMSEA = 0.084; SRMR = 0.038.

Bergen Social Media Addiction Scale (BSMAS)

· **Descriptive Statistics:** Mean total score = 15.79, SD = 5.40.
· **Reliability:** Cronbach's alpha = 0.81; Guttman's Lambda-6 = 0.79; Omega Total = 0.84; Omega Hierarchical = 0.75.
· **Exploratory Factor Analysis:** KMO = 0.861; Bartlett's Test: $\chi^2 = 570.75$, df = 15, $p < 0.001$. One component extracted, explaining 52.07% of variance.
· **CFA: Single-factor model:** CFI = 0.992; TLI = 0.987; RMSEA = 0.038; SRMR = 0.027. Multi-factor model (3 subfactors) shows near-perfect fit: CFI = 1.000; TLI = 1.013; RMSEA = 0.000; SRMR = 0.007.

Internet Gaming Disorder Scale (IGDS9-SF)

· **Descriptive Statistics:** Total score mean = 17.44 (SD = 7.78).
· **Reliability:** Cronbach's alpha = 0.90; Guttman's Lambda-6 = 0.89; Omega Total = 0.92; Omega Hierarchical = 0.78.
· **Exploratory Factor Analysis:** KMO = 0.926; Bartlett's Test: $\chi^2 = 1400.34$, df = 36, $p < 0.001$. One component explained 55.02% of variance.
· **CFA: Single-factor model:** CFI = 0.967; TLI = 0.955; RMSEA = 0.072; SRMR = 0.037. Bifactor model: CFI = 0.993; TLI = 0.978; RMSEA = 0.051; SRMR = 0.019.

Strengths and Difficulties Questionnaire (SDQ)

· **Descriptive Statistics:** Total score mean = 49.28 (SD = 5.37).
· **Reliability:** Cronbach's alpha = 0.43; Guttman's Lambda-6 = 0.59; Omega Total = 0.56; Omega Hierarchical = 0.44.
· **Exploratory Factor Analysis:** KMO = 0.730; Bartlett's Test: $\chi^2 = 1717.50$, df = 300, $p < 0.001$. Eight factors extracted, explaining 59.30% of variance.
· **CFA: Single-factor model:** CFI = 0.348; TLI = 0.289; RMSEA = 0.102; SRMR = 0.117. Poor fit. Five-factor model: CFI = 0.880; TLI = 0.842; RMSEA = 0.048; SRMR = 0.053.

5.2. Key Findings and Insights

Smartphone Addiction (SAS): Based on the ROC-derived cutoff of 31, 25.67% of students were classified as having high smartphone addiction. The distribution was right-skewed, with scores mostly concentrated between 15 and 35. Age-wise, 15-year-olds had the highest proportion of high addiction (10.75%), with a steady decline at ages 16 (10.15%) and 17 (4.78%). Gender-wise, 14.03% of boys and 11.64% of girls were in the high-risk group. Quartile-based classification placed 9.6% of students in the severe category. Boys were also more represented in severe addiction (5.7%) compared to girls (3.9%). These trends indicate that problematic smartphone use decreases with age and is slightly more prevalent among boys.

Social Media Addiction (BSMAS): Using a validated cutoff of 20, 25.67% of students were classified as high risk. Most students scored between 12 and 20, suggesting mild to moderate risk. Females were more affected than males, with 14.03% of girls and 11.64% of boys in the high-risk category. Severe addiction was observed in 4.8% of girls and 3.3% of boys. Age-wise, 15-year-olds had the highest representation in high and severe categories, supporting a pattern of early adolescent vulnerability.

Fear of Missing Out (FOMO): According to the cutoff score of 31, 30.45% of students were categorized as high FOMO. The score distribution was slightly right-skewed, peaking around 25–30. Female students (16.72%) were more likely to experience high FOMO compared to male students (13.73%). Age-wise, 15-year-olds showed the highest FOMO rates (14.63%), which declined with age (16-year-olds: 12.54%, 17-year-olds: 3.28%). Percentile-based classification revealed 9.6% of students as having severe FOMO. These results show FOMO is common and more prominent among younger students, especially females.

Internet Gaming Disorder (IGDS9-SF): A cutoff score of 23 classified 28.06% of students as high-risk. The distribution was heavily right-skewed, with most scores between 10 and 20. Male students were disproportionately affected: 22.09% of males versus 5.97% of females were in the high addiction group. Age-wise, the trend again favored younger participants, with 15-year-olds showing the highest risk (13.43%), followed by 16-year-olds (10.15%) and 17-year-olds (4.48%). Percentile-based grouping placed 8.7% in the severe category. Boys dominated moderate, high, and severe categories.

Psychological Difficulties (SDQ): Based on the modified scoring system (20–60 range), 48.66% of students were in the "Abnormal" category, 25.07% were "Borderline," and 26.27% were "Normal." The distribution was bell-shaped, with most scores clustering between 30 and 40. Males had higher rates in both Borderline (17.01%) and Abnormal (24.78%) groups, while females were more present in the Normal category (17.61%). Age breakdown showed 15-year-olds were the most affected: 13.43% in Borderline and 22.69% in Abnormal. These findings highlight emotional and behavioral vulnerability at younger ages.

Correlation Patterns: Strong positive correlations were observed among SAS, BSMAS, and FOMO scores, indicating co-occurrence of digital dependencies. These three scales also showed moderate correlations with SDQ, pointing to their influence on emotional well-being. IGDS9 correlated well with SAS and BSMAS but not significantly with SDQ, suggesting a behavioral rather than emotional pattern.

Overall, one-way ANOVA results consistently showed that age and gender significantly influenced scale scores. Younger adolescents (especially age 15) were more vulnerable across all domains, while males were more affected by gaming and smartphone use, and females showed greater risk for social media addiction and FOMO.

6.Discussion & Conclusion

6.Discussion & Conclusion

The findings of this study reveal critical insights into the digital behaviors and psychological profiles of Turkish adolescents. The digital behaviors of adolescents in Turkey are not isolated habits but reflections of deeper emotional, cognitive, and developmental challenges. A considerable portion of students exhibited high or severe symptoms of smartphone, social media, and gaming addiction. FOMO was particularly pronounced among younger students, reinforcing developmental vulnerabilities in mid-adolescence. The modified SDQ results showed that nearly half of the respondents experience emotional and behavioral difficulties, particularly among younger males.

Gender differences were consistently observed, with males being more susceptible to gaming addiction and females reporting higher social media and FOMO scores. The strong correlations among SAS, BSMAS, and FOMO suggest these constructs may co-occur, exacerbating emotional challenges, as evidenced by their shared association with higher SDQ scores.

In particular, integrating psychological screening into school health services and offering tailored support for at-risk groups—such as 15-year-old boys for gaming and girls for social media use—can foster healthier digital habits and mental health outcomes among Turkish adolescents.

Overall, this study provides robust empirical evidence to inform national strategies on youth mental health and digital media use.

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Appendix

Fig.A1

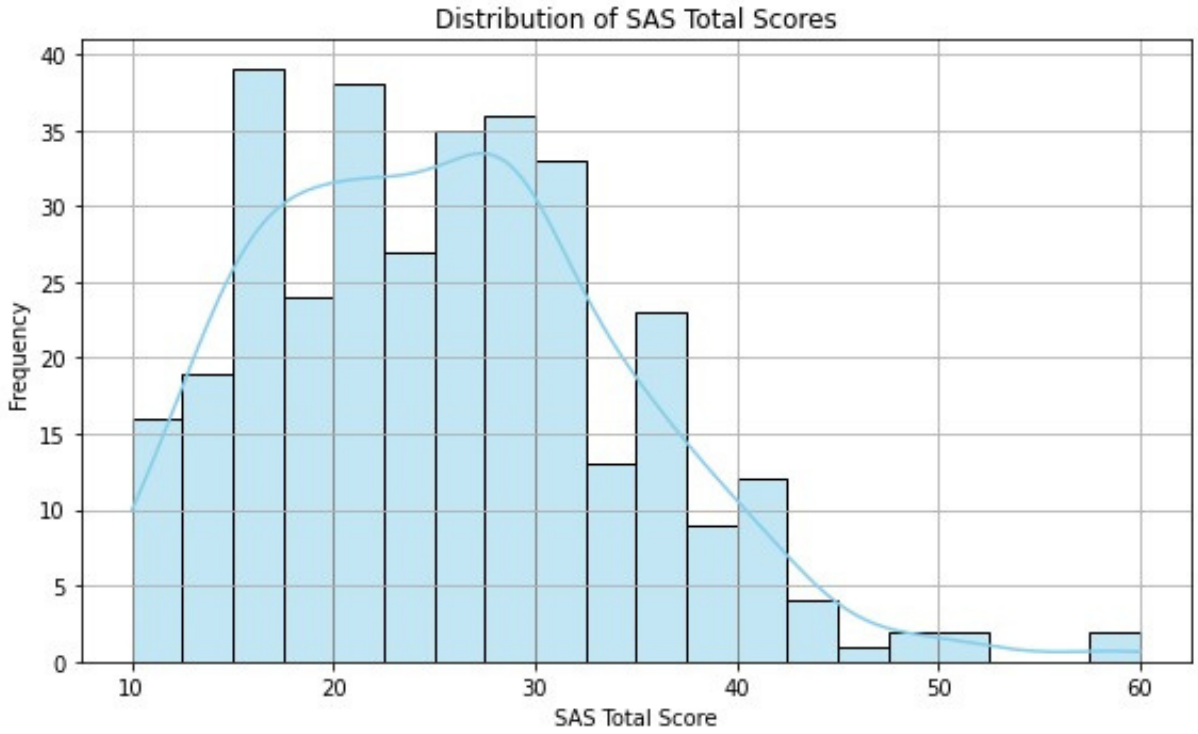


Fig.A2

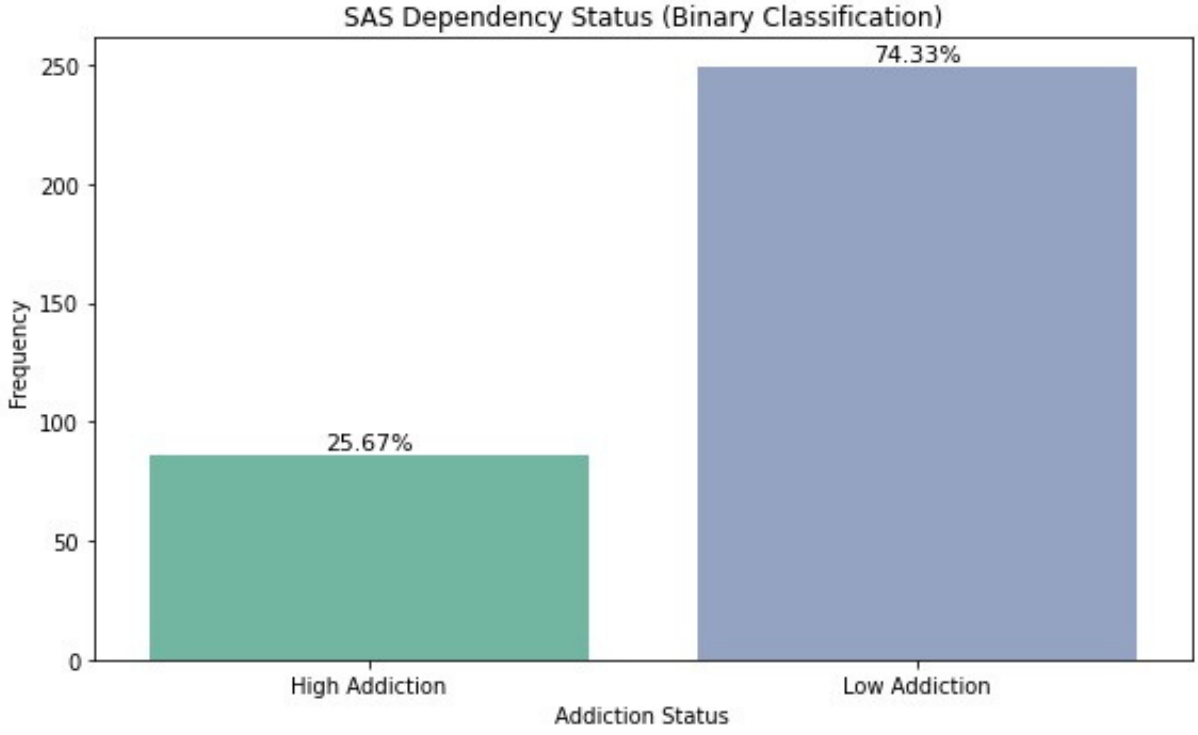


Fig.A3

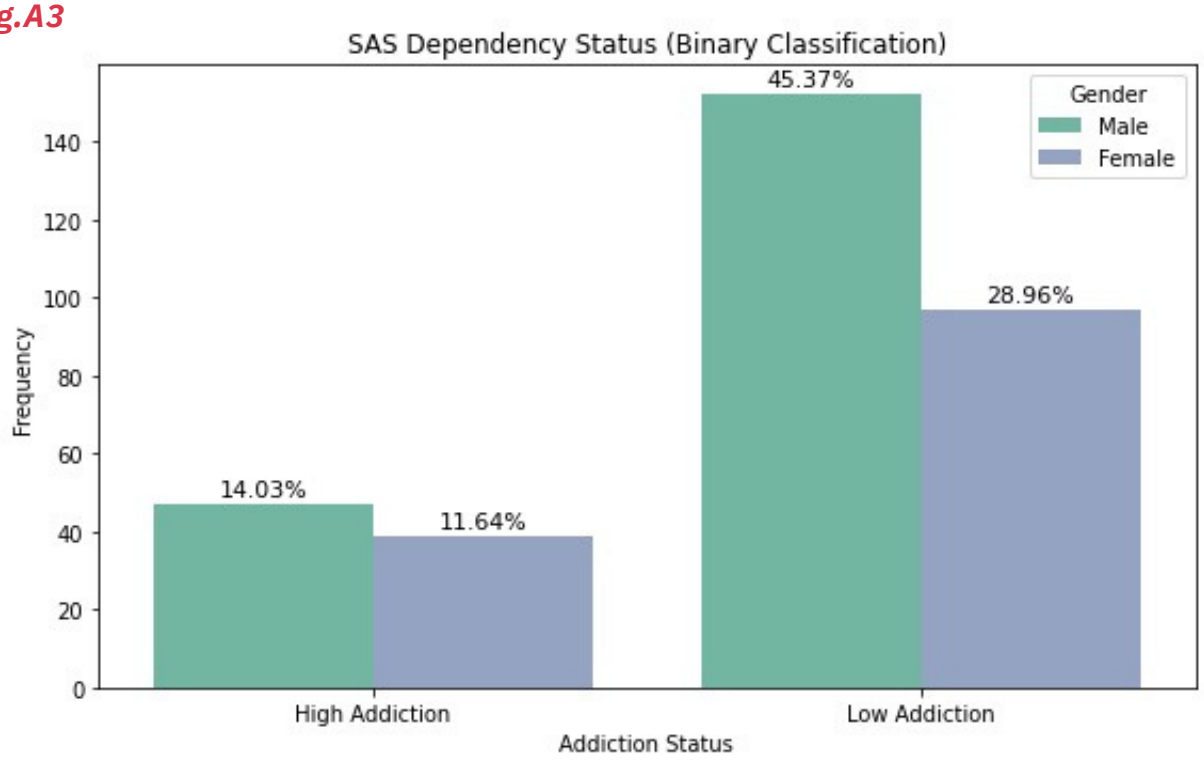

SAS Dependency Status (Binary Classification)
Gender
Male
Female
45.37%
28.96%
14.03%
11.64%
Frequency
0
20
40
60
80
100
120
140
High Addiction
Low Addiction
Addiction Status

Fig.A4

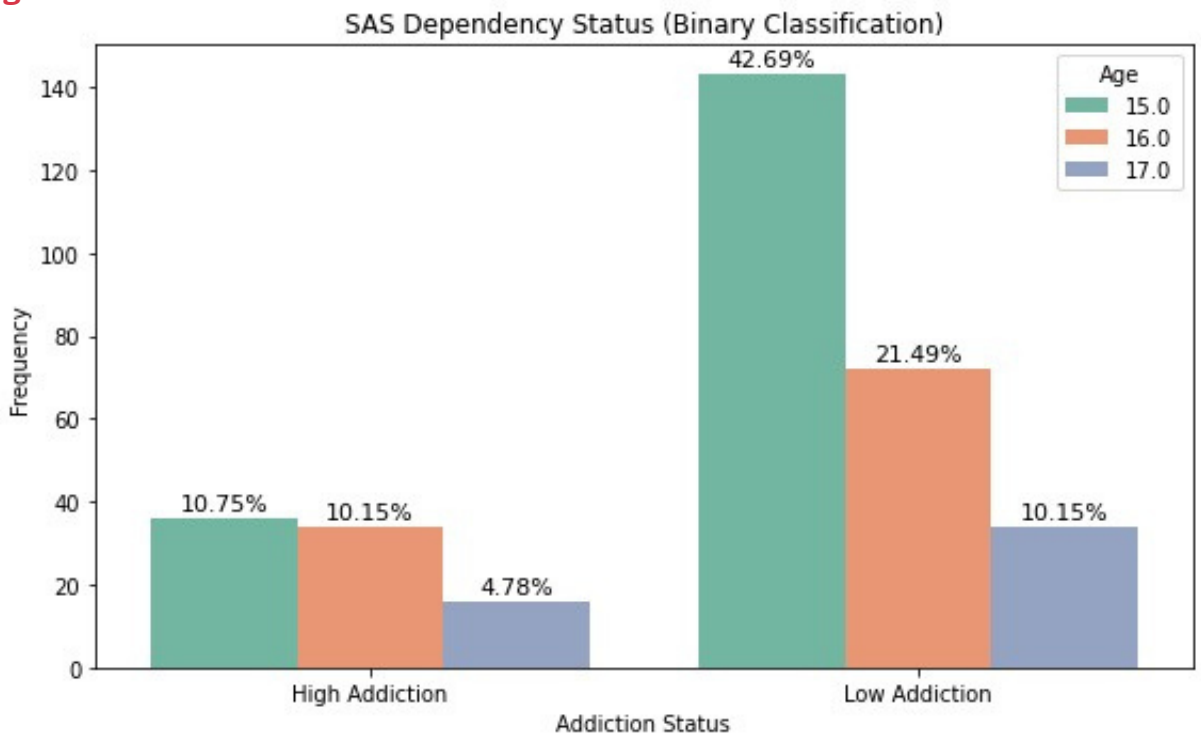

SAS Dependency Status (Binary Classification)
Age
15.0
16.0
17.0
42.69%
21.49%
10.15%
10.75%
10.15%
4.78%
Frequency
0
20
40
60
80
100
120
140
High Addiction
Low Addiction
Addiction Status

Fig.A5

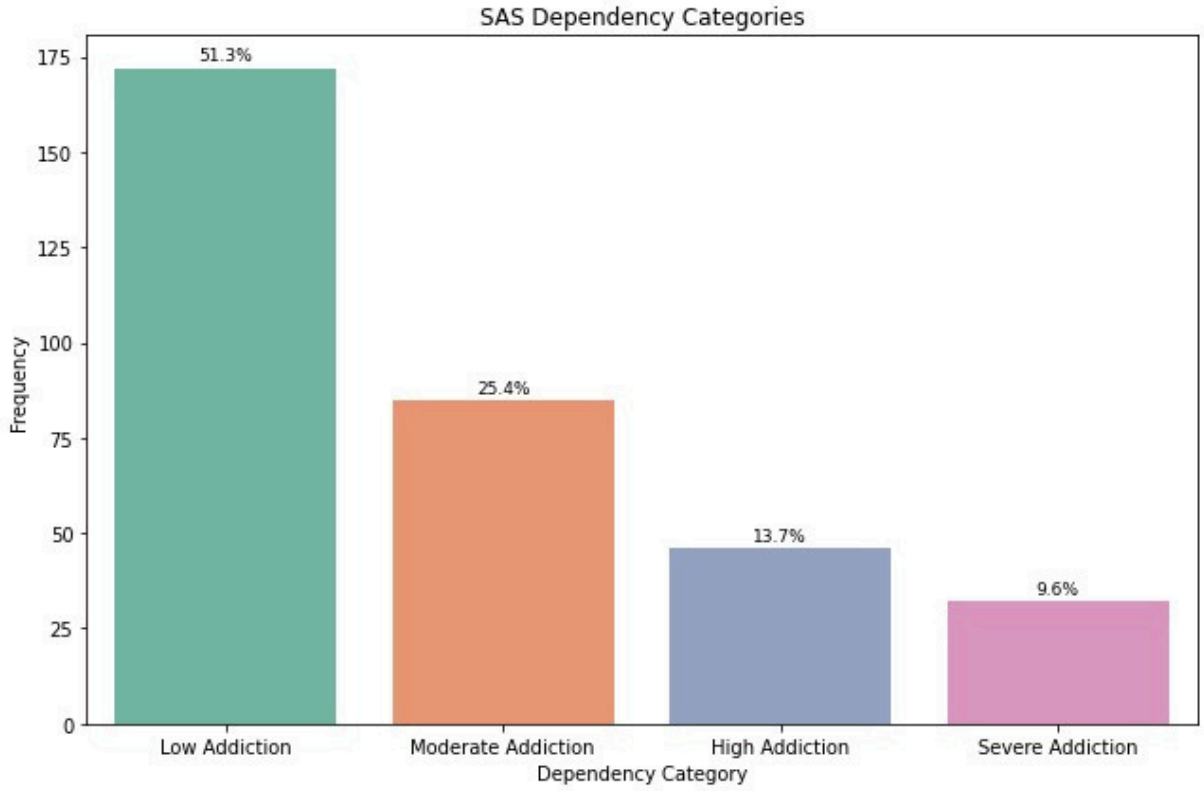

SAS Dependency Categories
51.3%
25.4%
13.7%
9.6%
Frequency
0
25
50
75
100
125
150
175
Low Addiction
Moderate Addiction
High Addiction
Severe Addiction
Dependency Category

Fig.A6

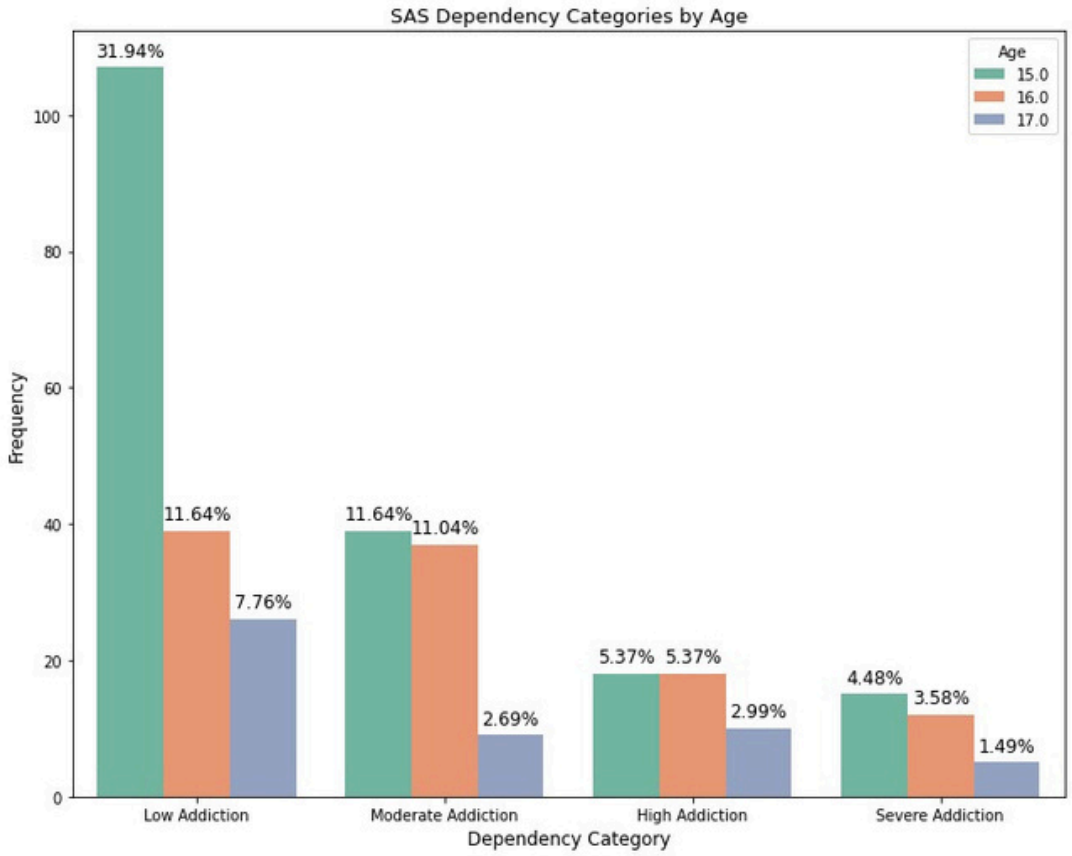

SAS Dependency Categories by Age
Age
15.0
16.0
17.0
31.94%
11.64%
7.76%
11.64%
11.04%
2.69%
5.37%
5.37%
2.99%
4.48%
3.58%
1.49%
Frequency
0
20
40
60
80
100
Low Addiction
Moderate Addiction
High Addiction
Severe Addiction
Dependency Category

Fig.A7

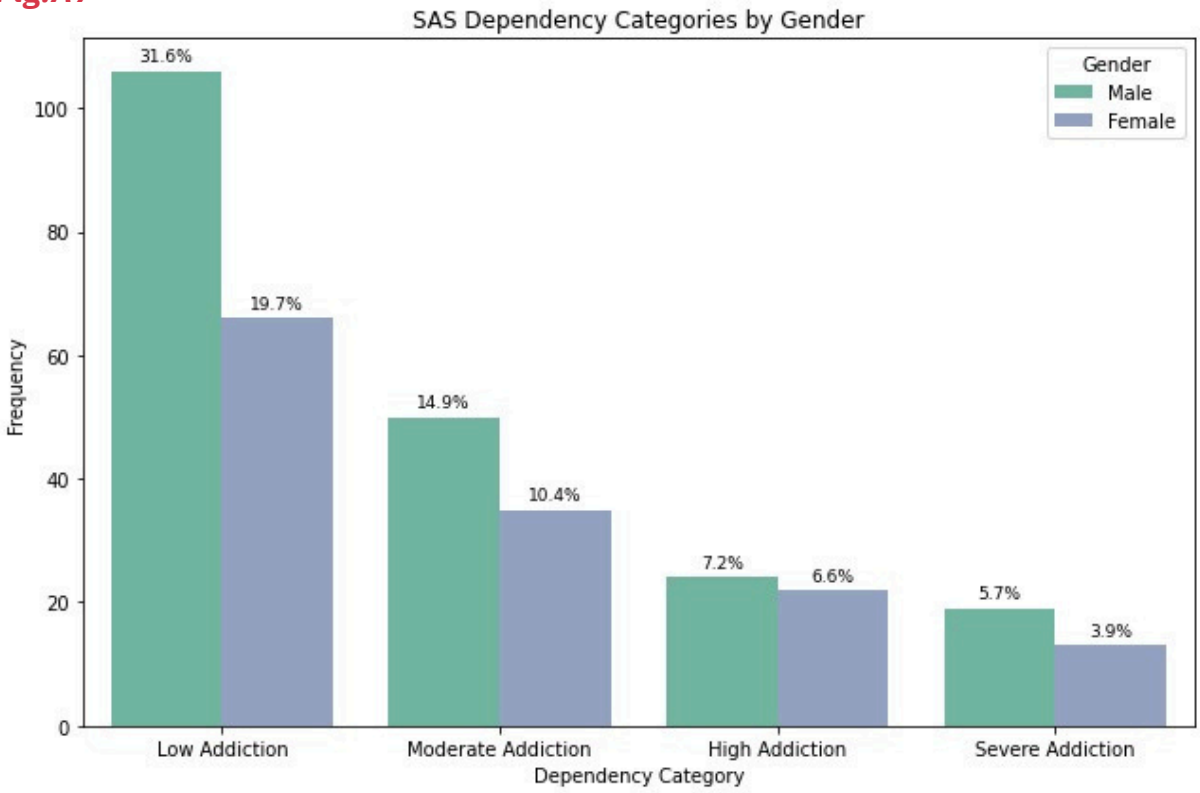

SAS Dependency Categories by Gender
Gender
Male
Female
31.6%
19.7%
14.9%
10.4%
7.2%
6.6%
5.7%
3.9%
Frequency
0
20
40
60
80
100
Low Addiction
Moderate Addiction
High Addiction
Severe Addiction
Dependency Category

Fig.A8

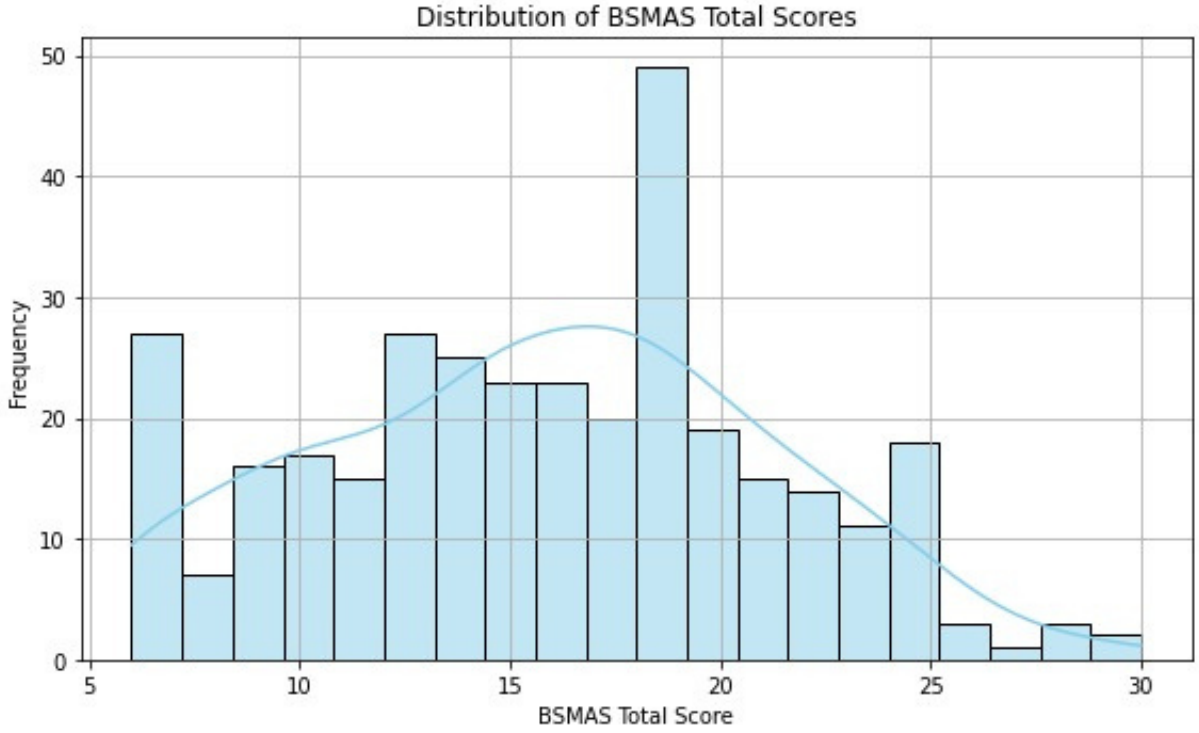
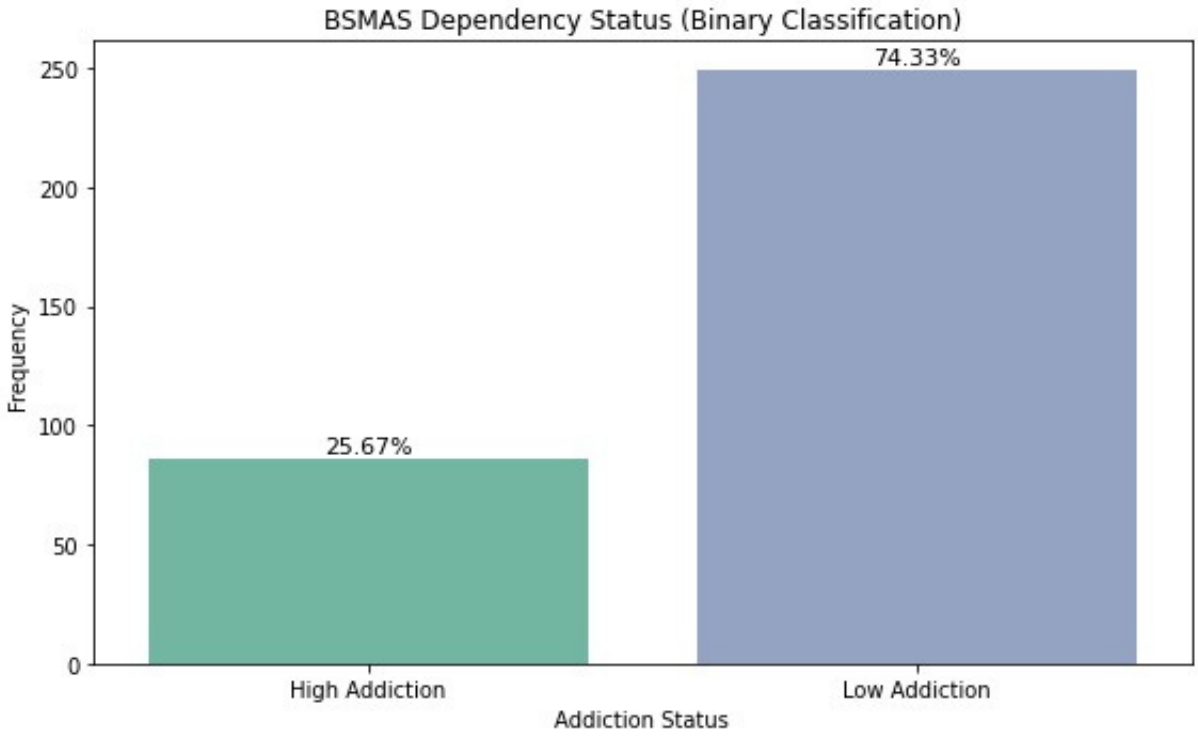

Distribution of BSMAS Total Scores
Frequency
0
10
20
30
40
50
5
10
15
20
25
30
BSMAS Total Score

Fig.A9



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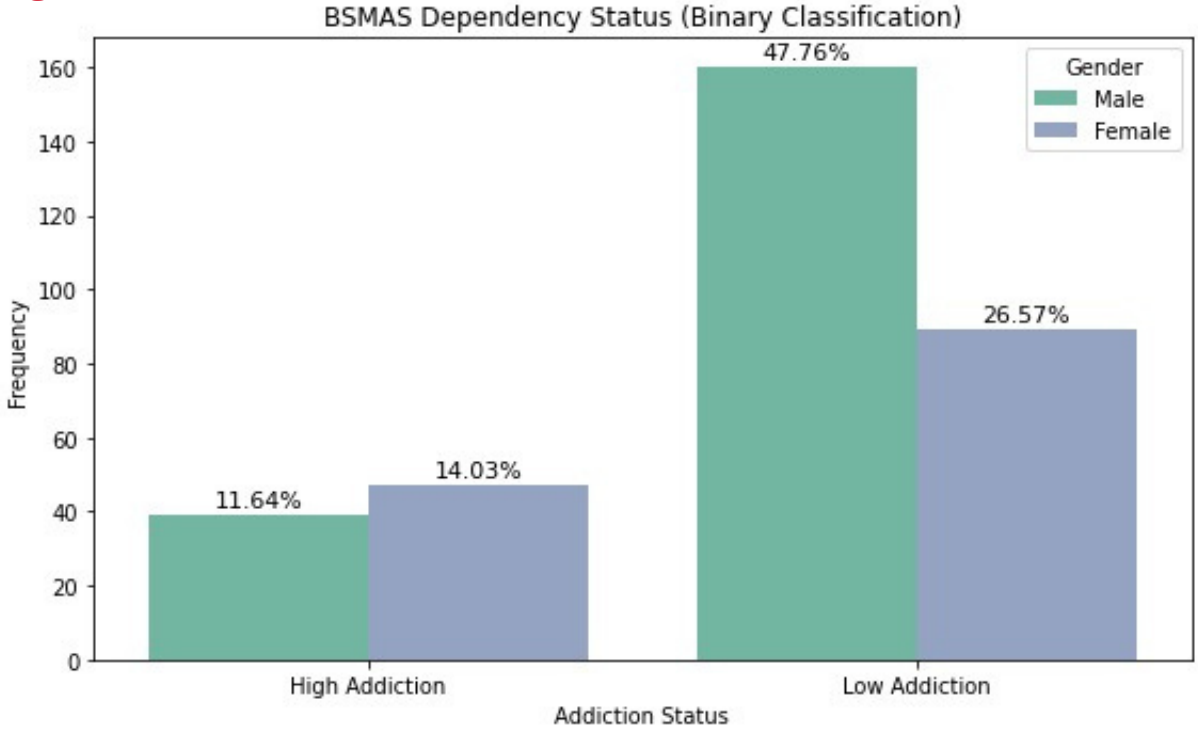

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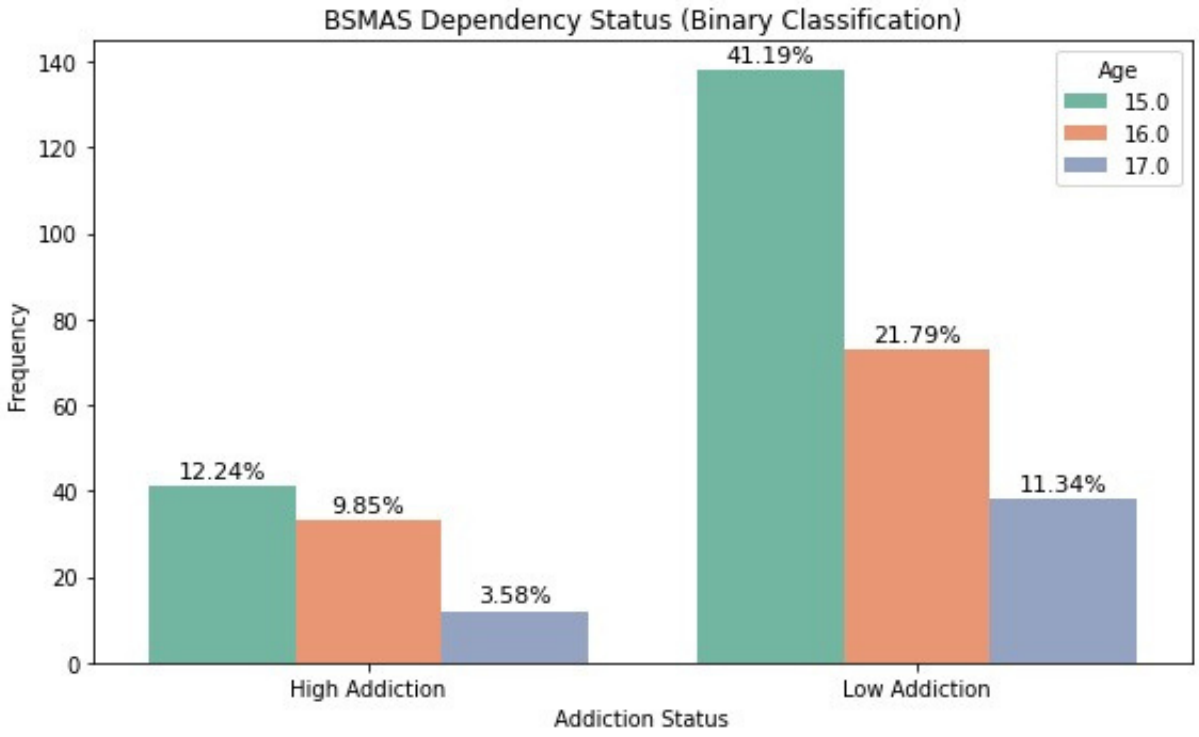

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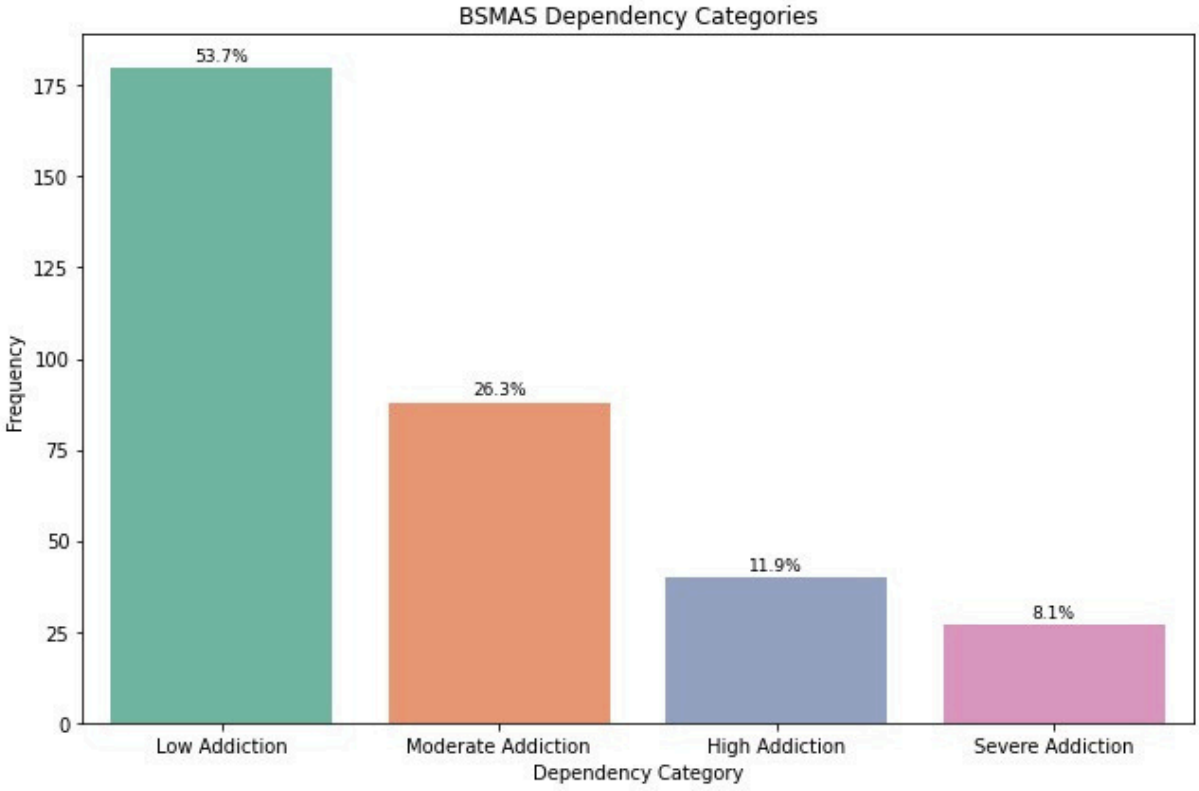
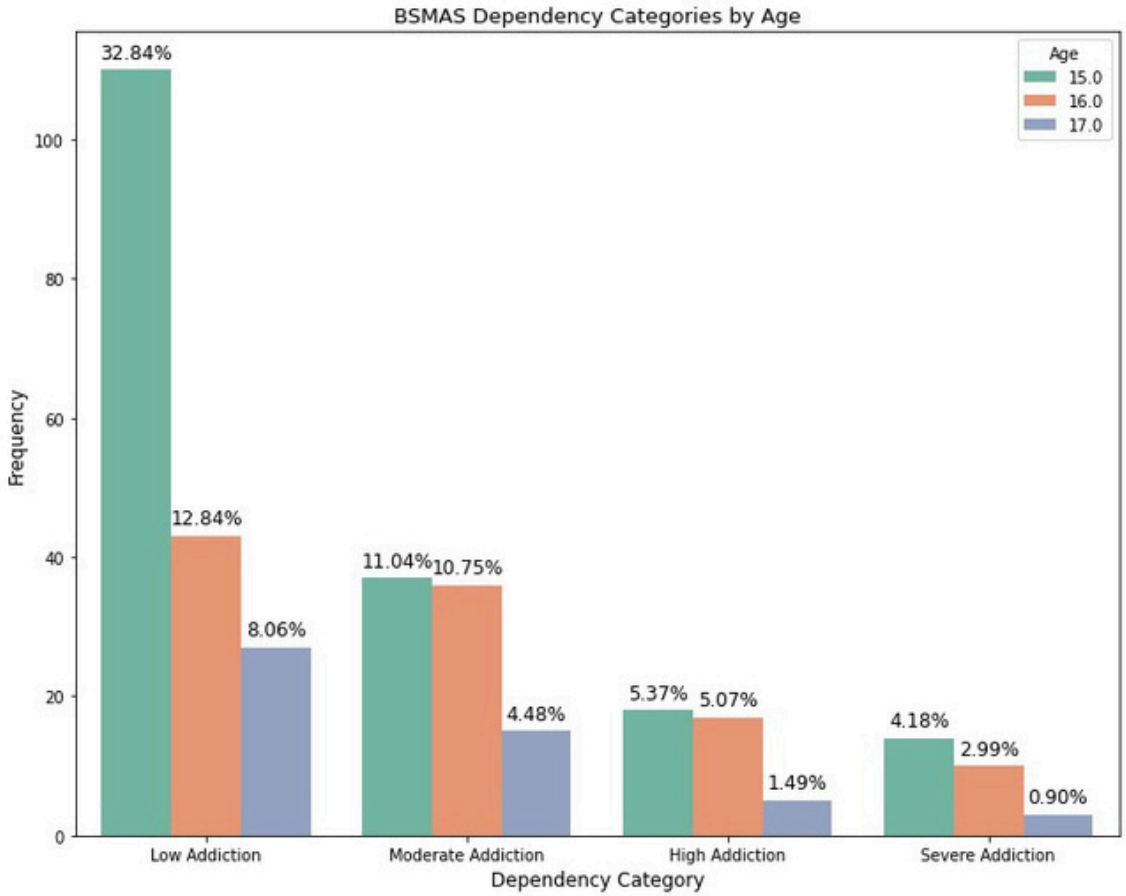


Fig.A13



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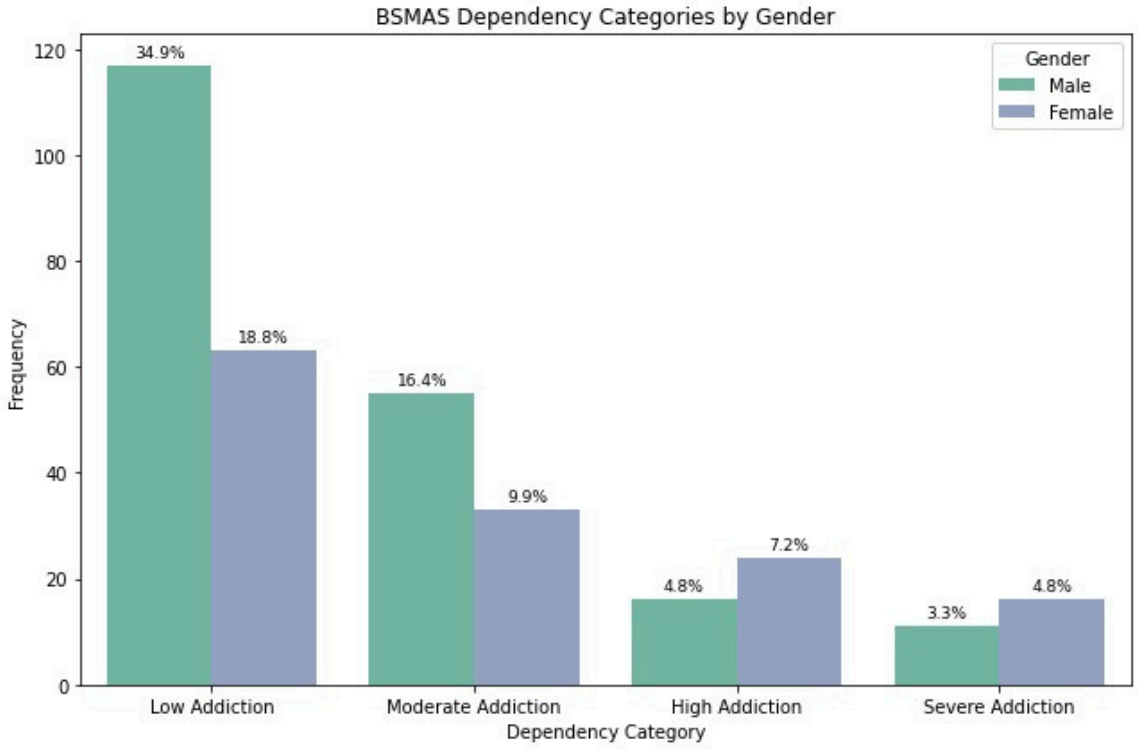

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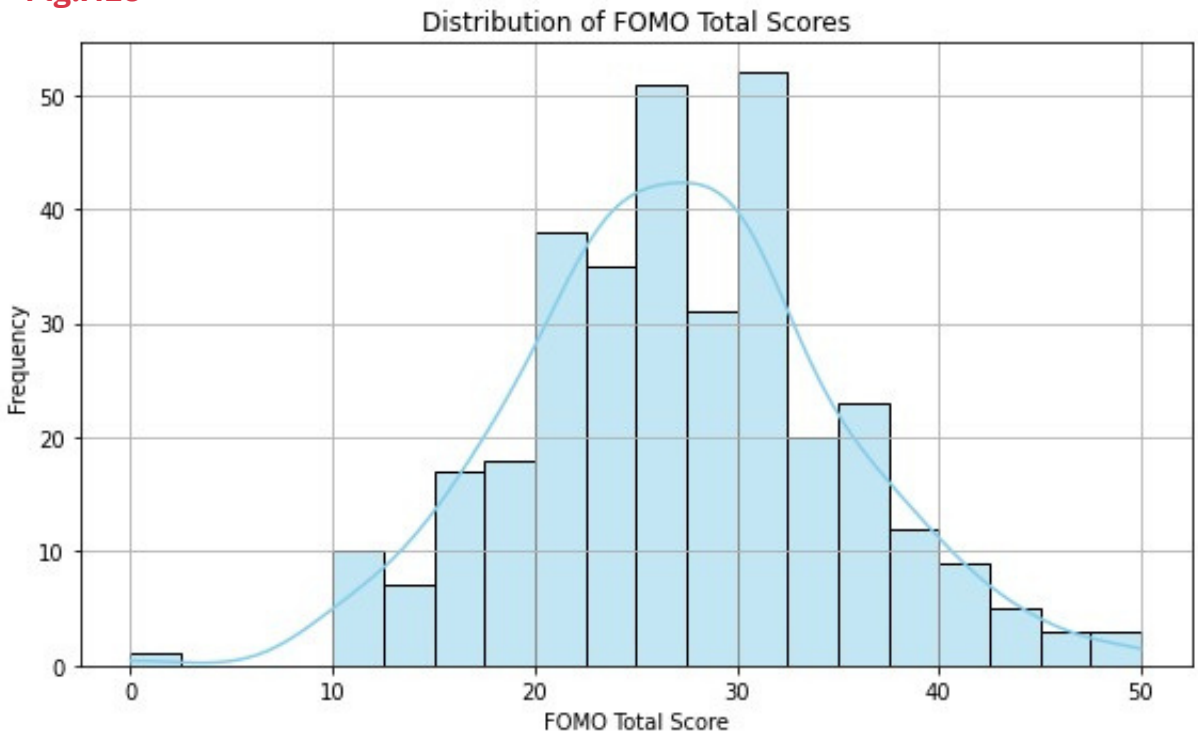
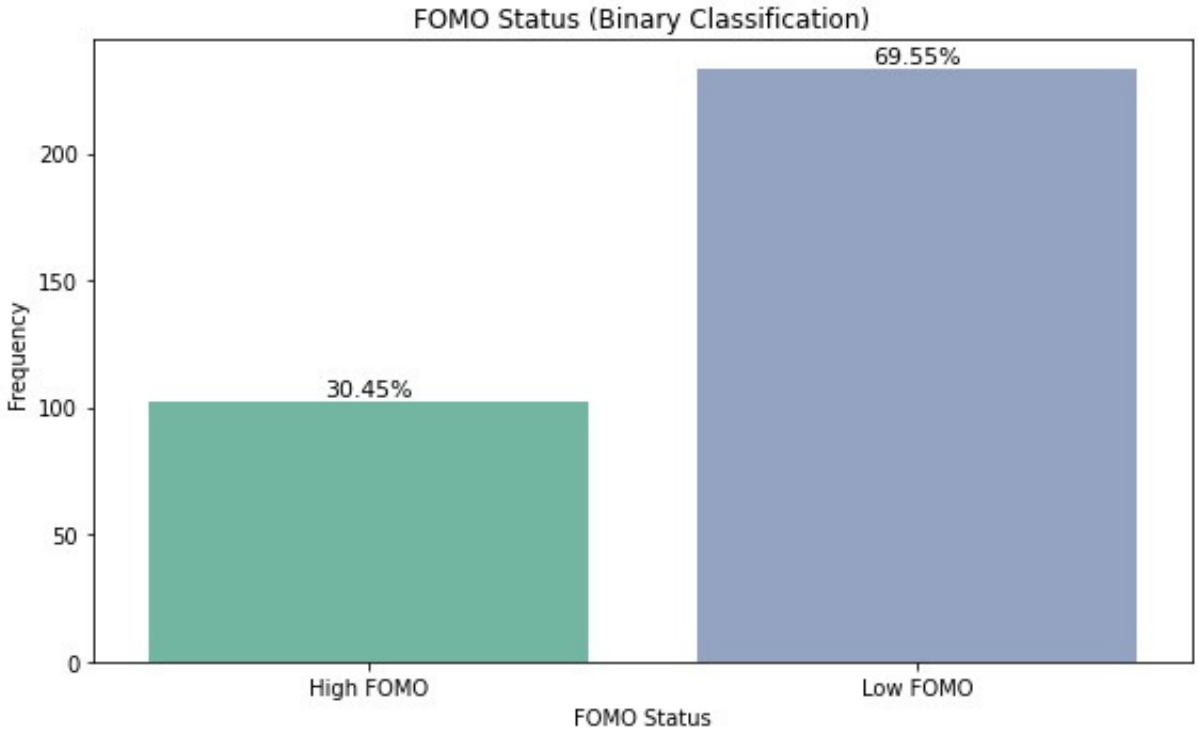


Fig.A16



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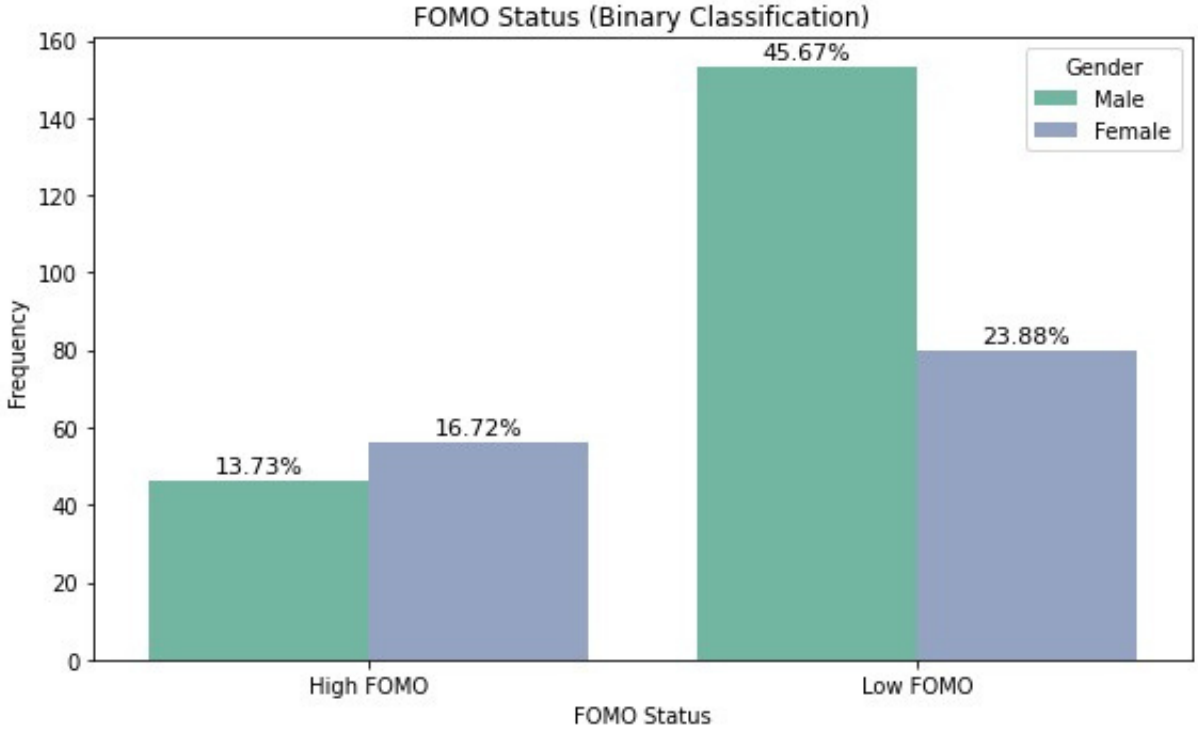


Fig.A18

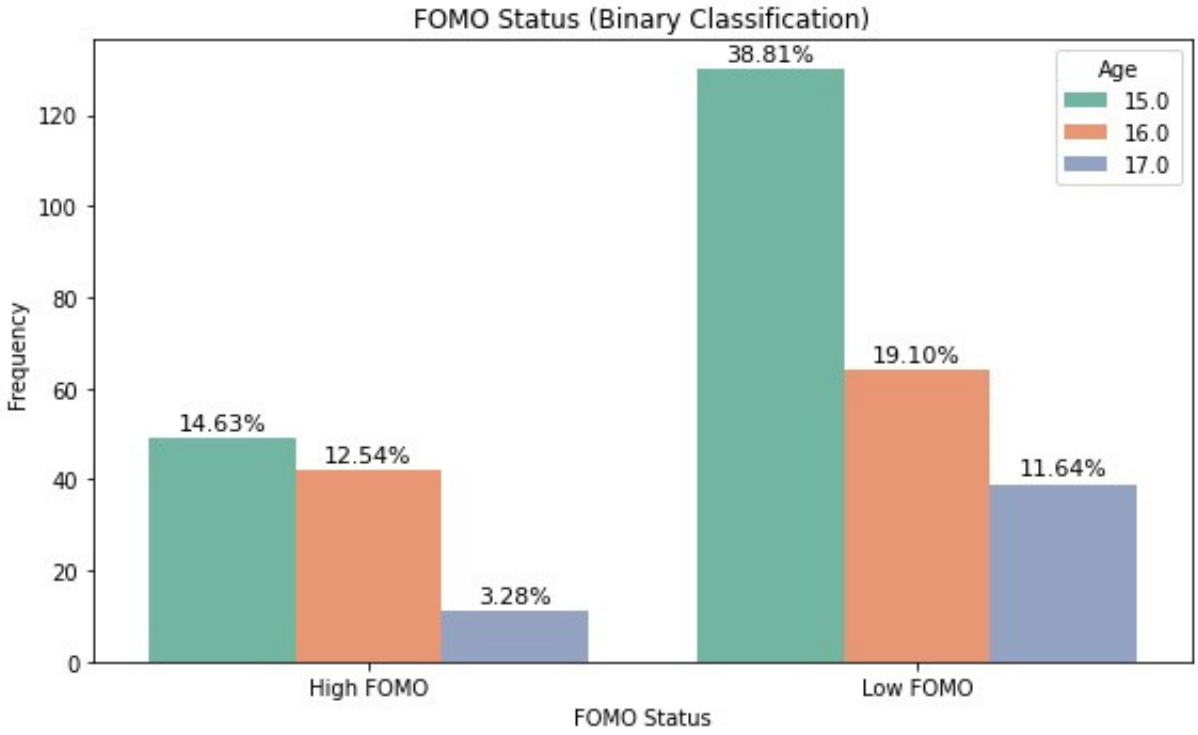


Fig.A19

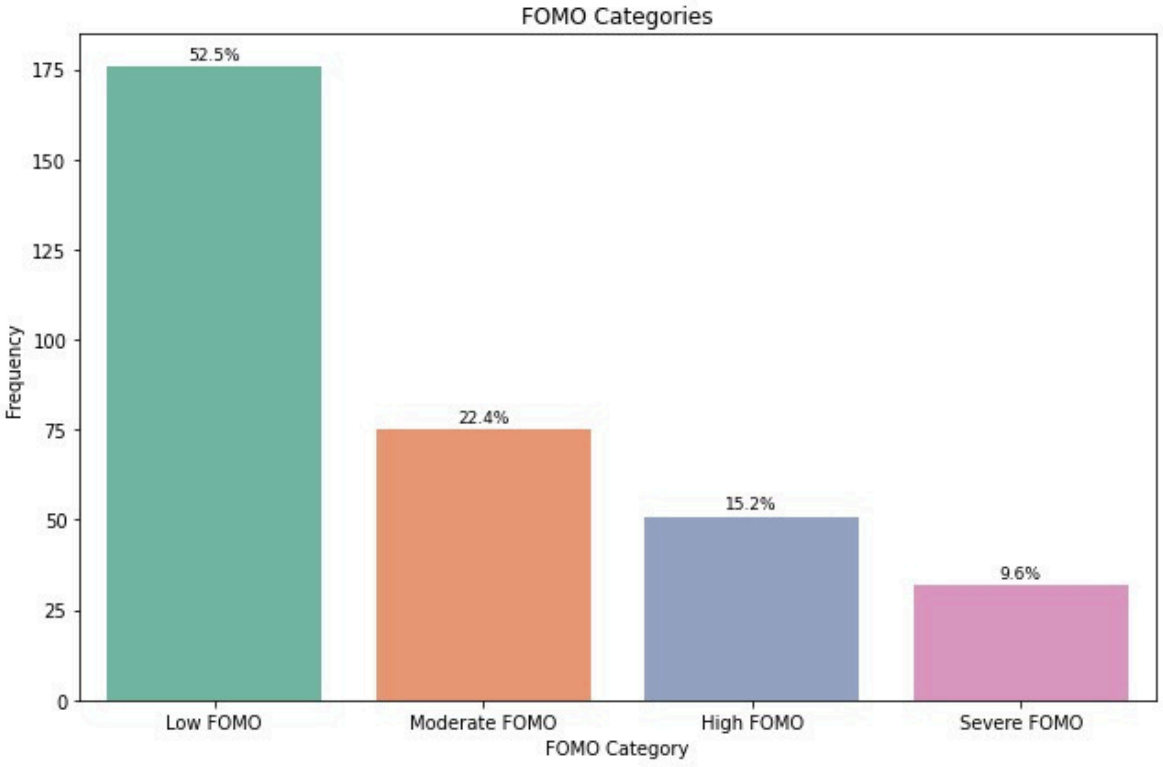


Fig.A20

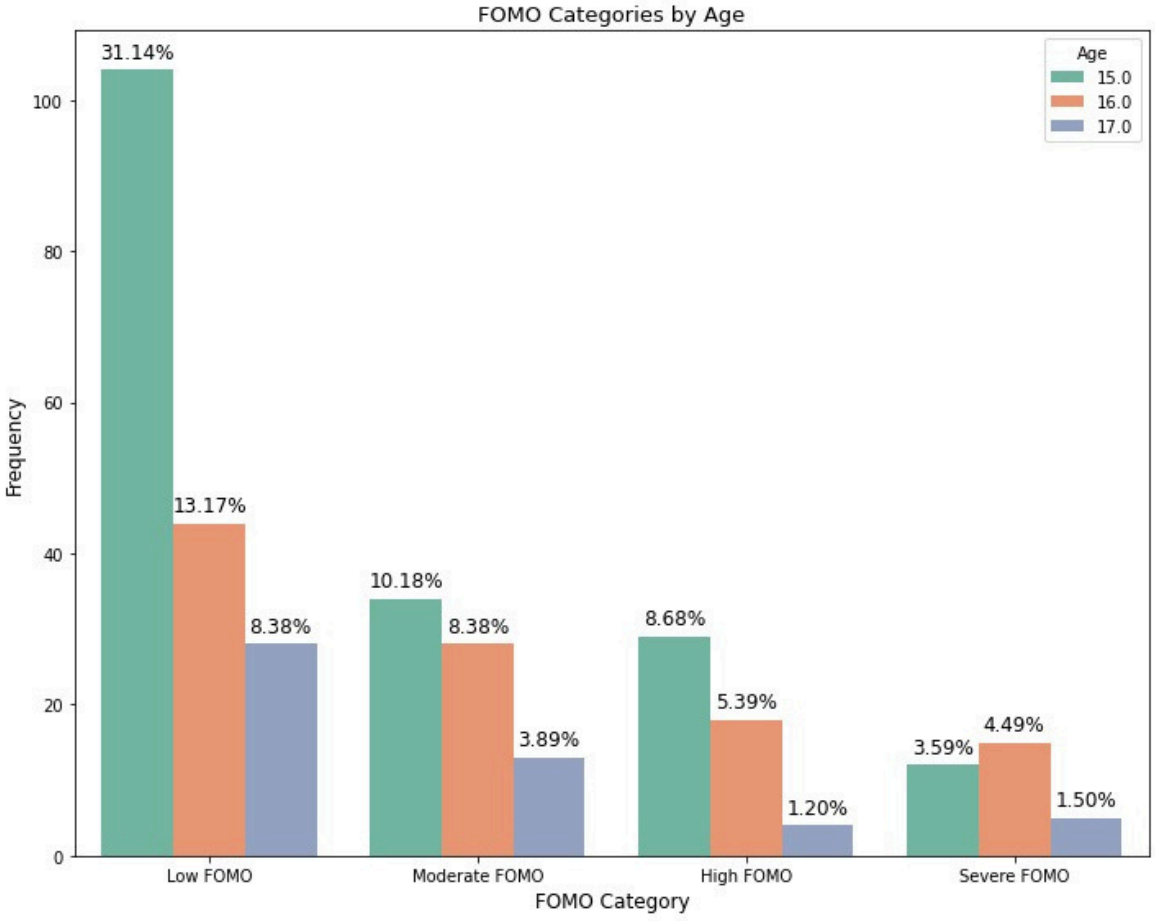


Fig.A21

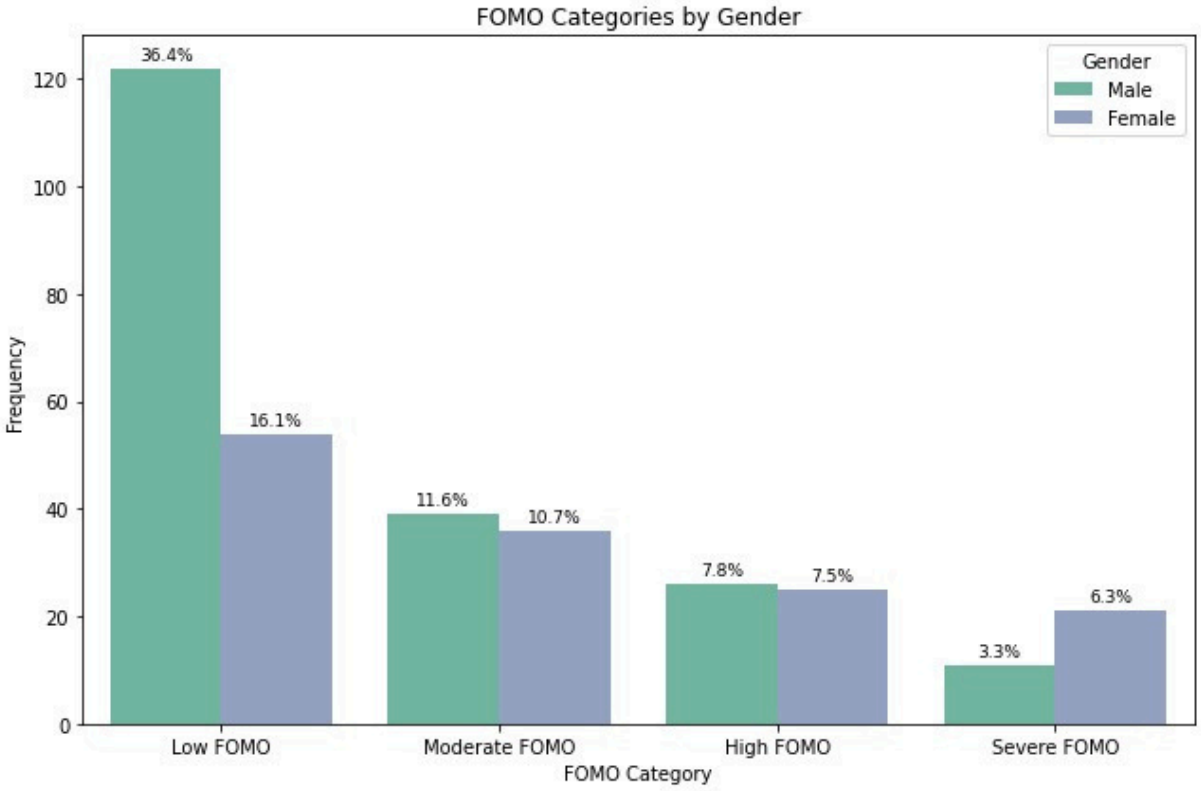


Fig.A22

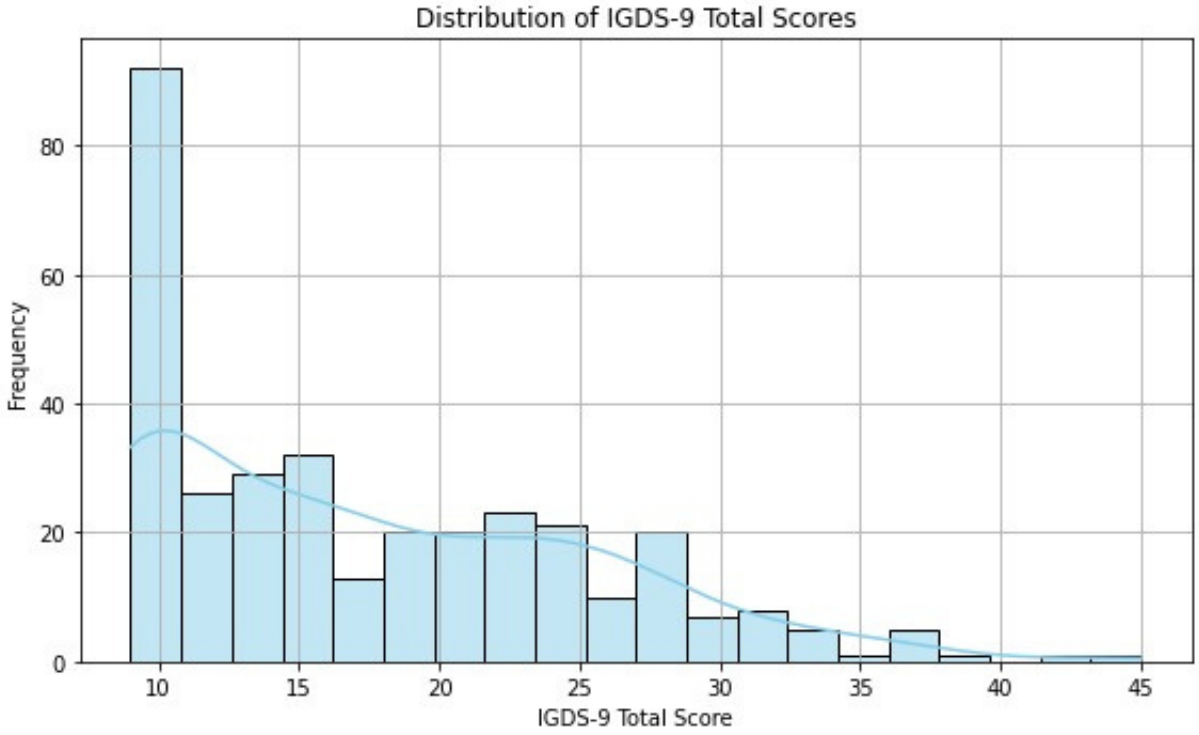


Fig.A23

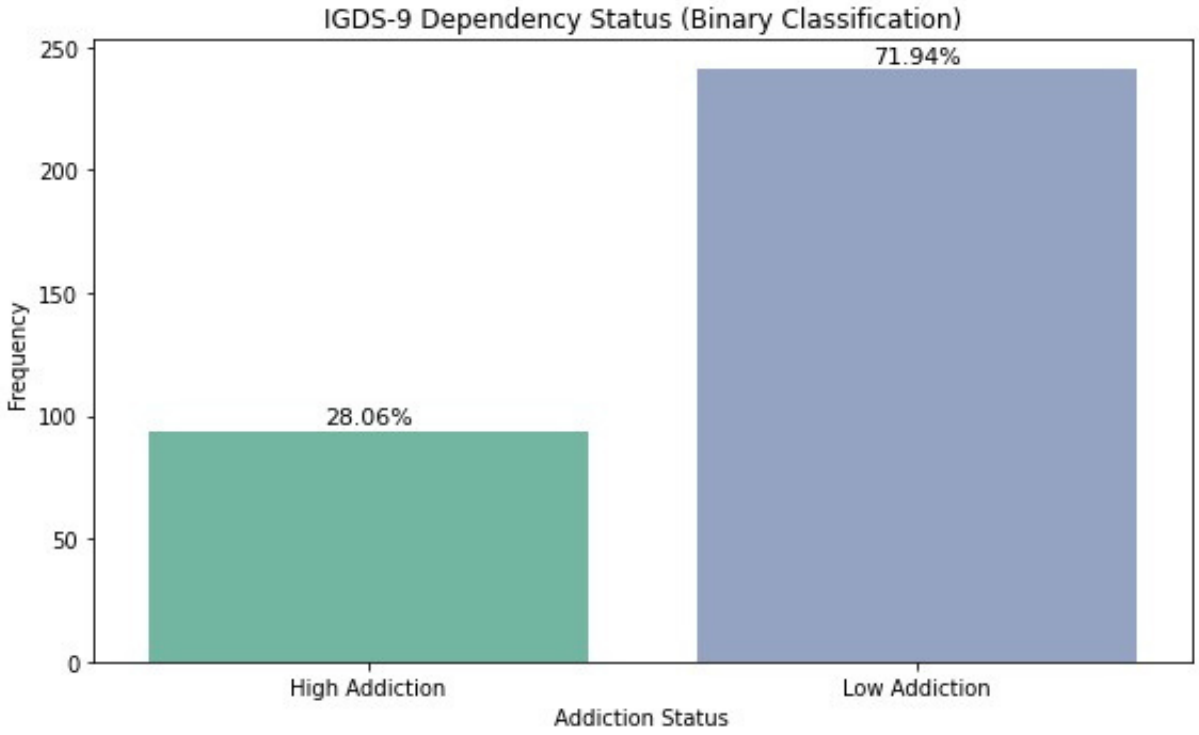


Fig.A24

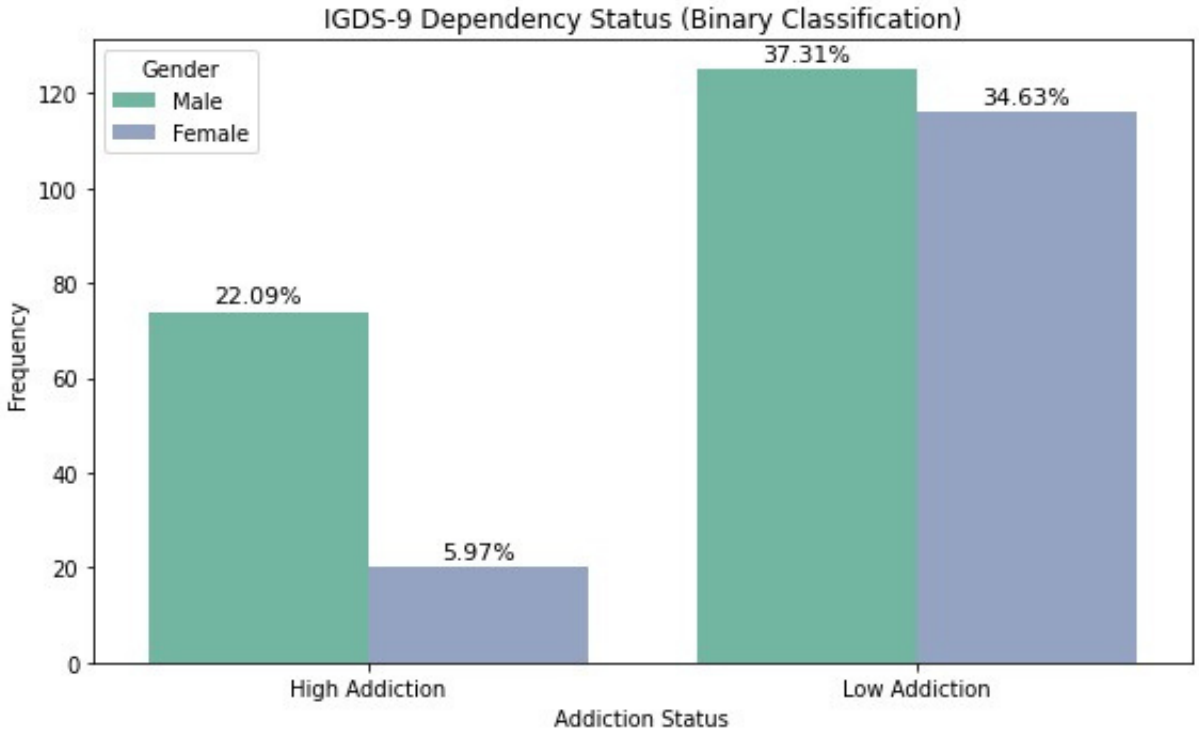


Fig.A25

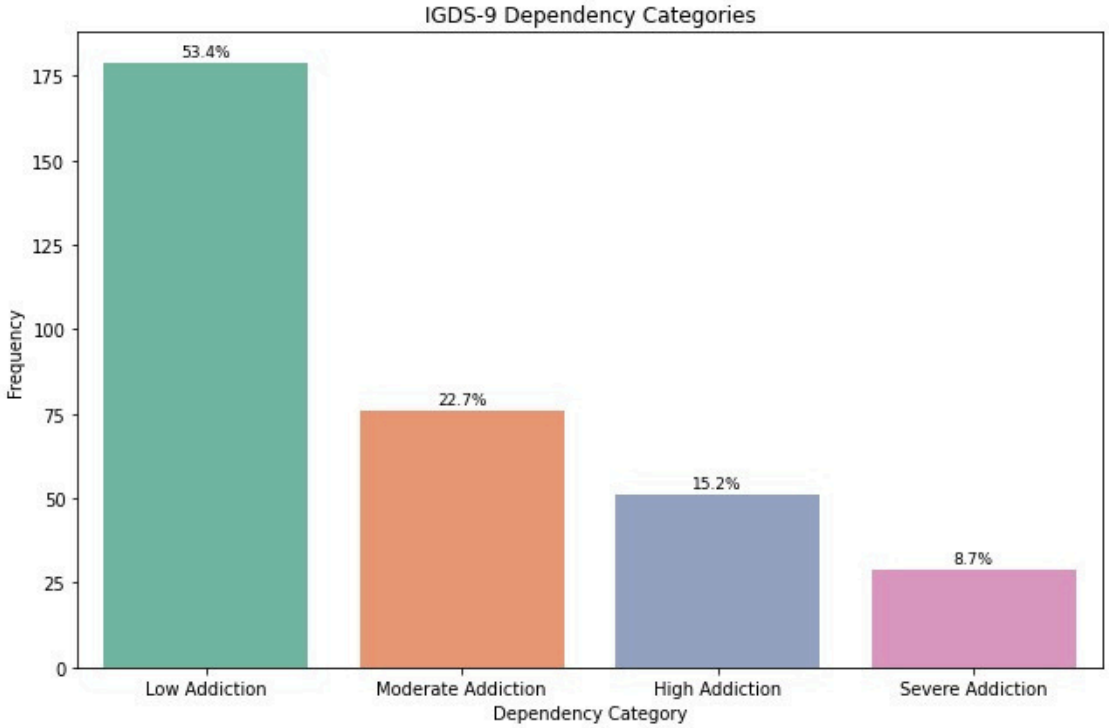


Fig.A26

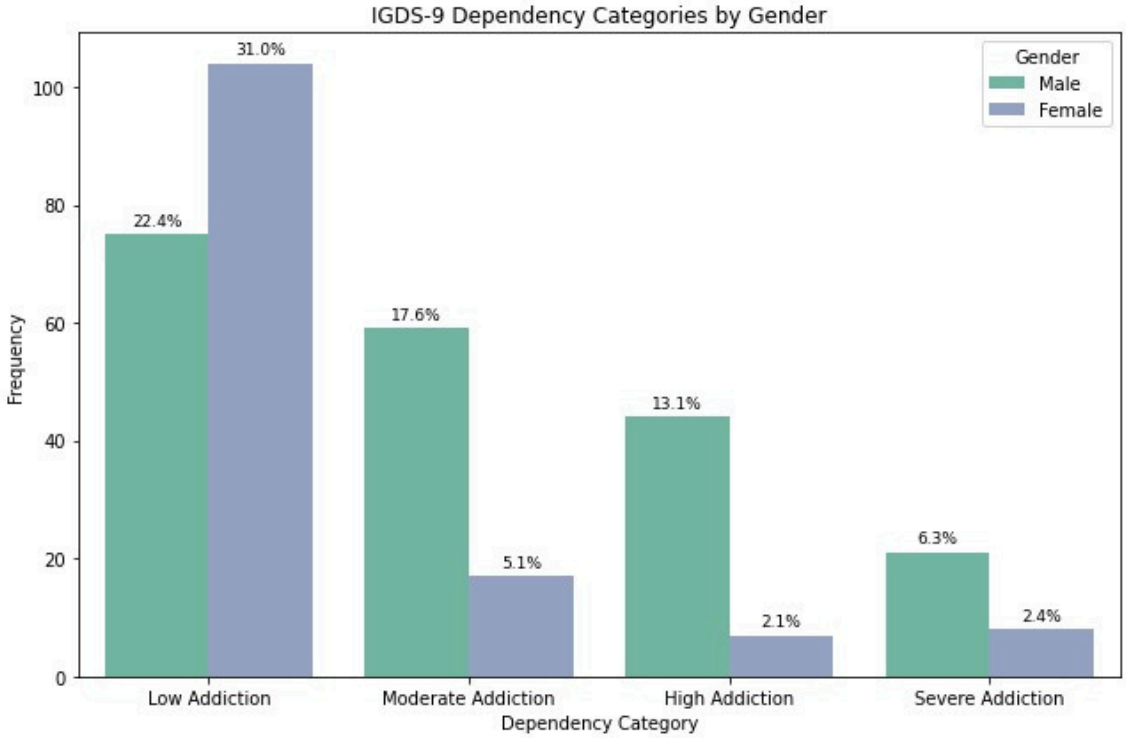


Fig.A27

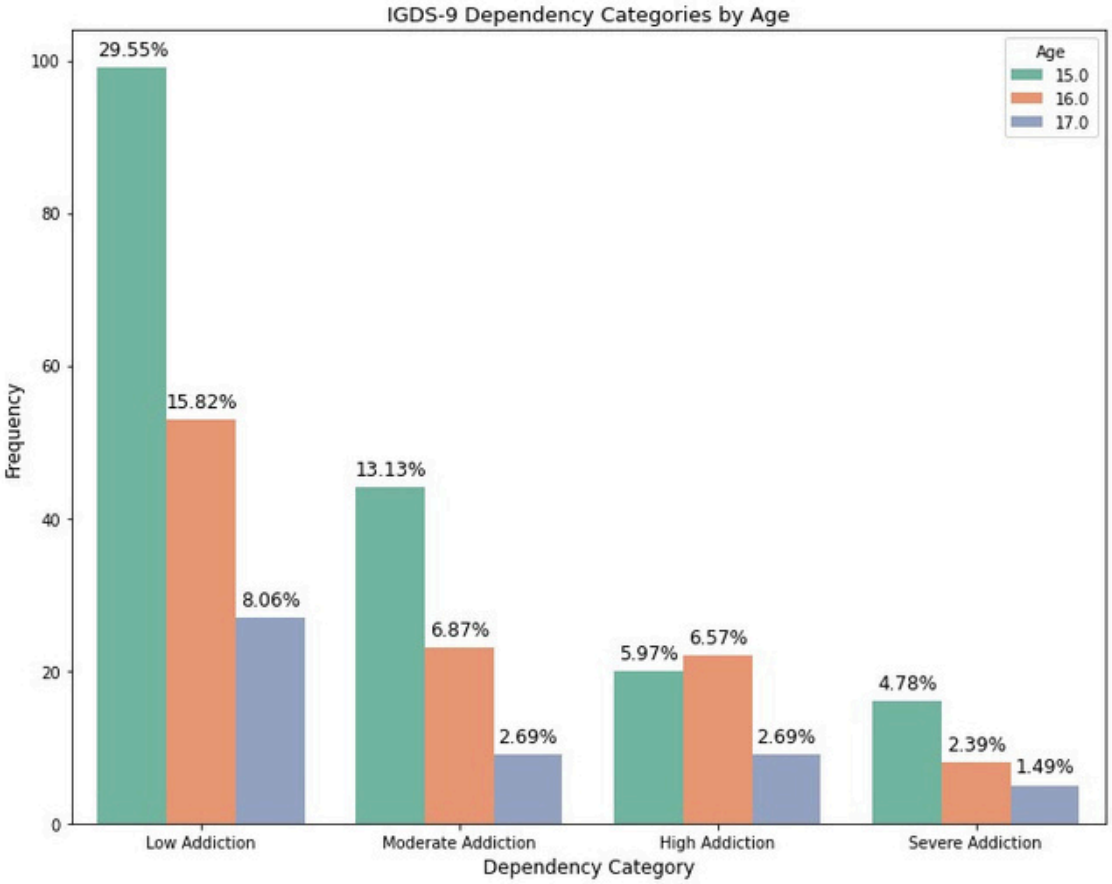


Fig.A28

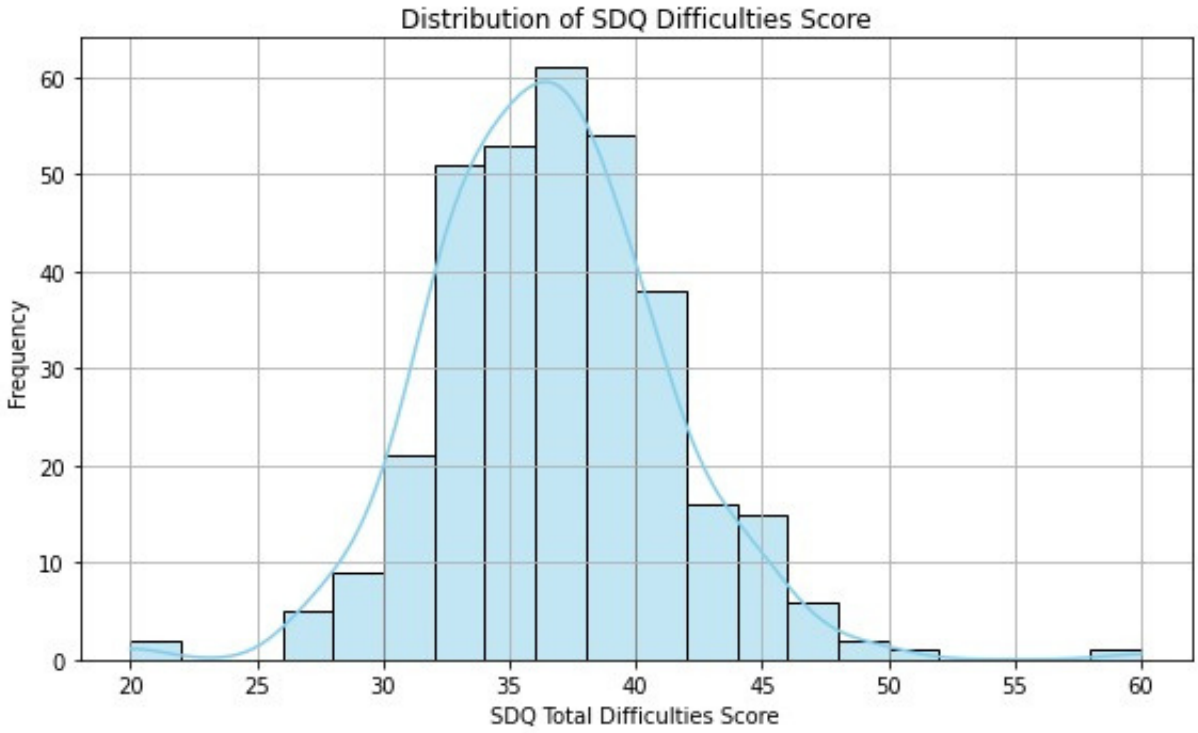


Fig.A29

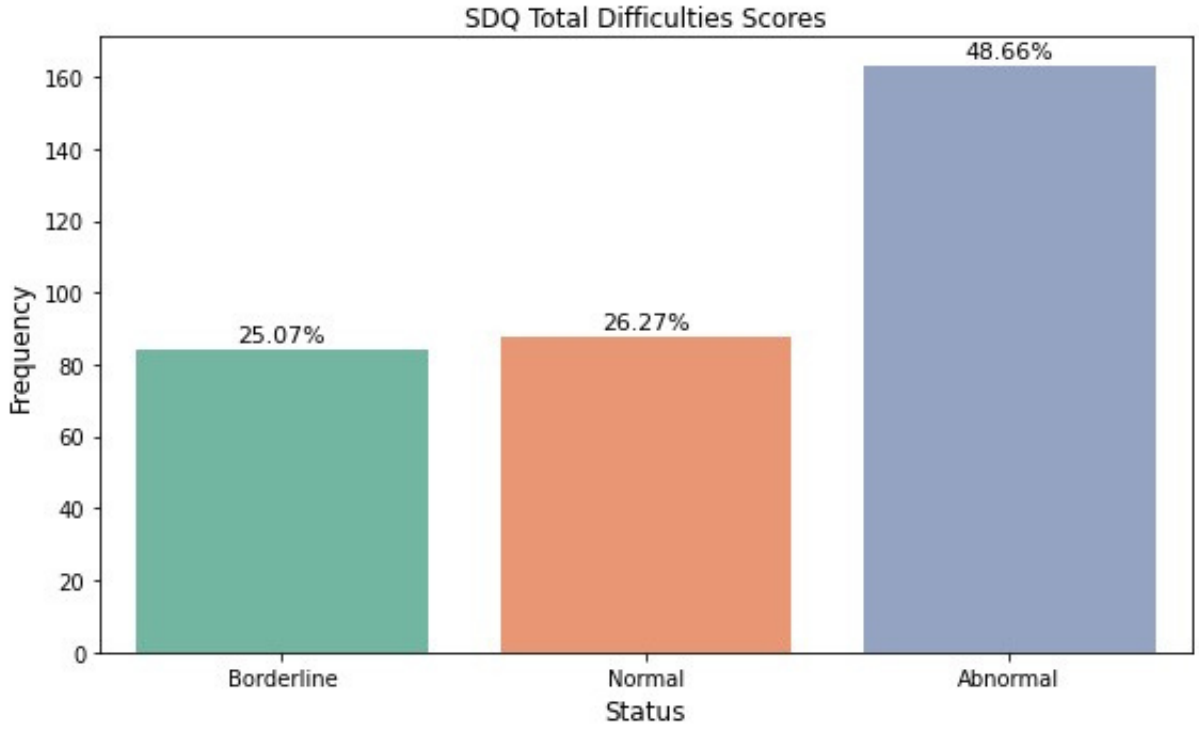


Fig.A30

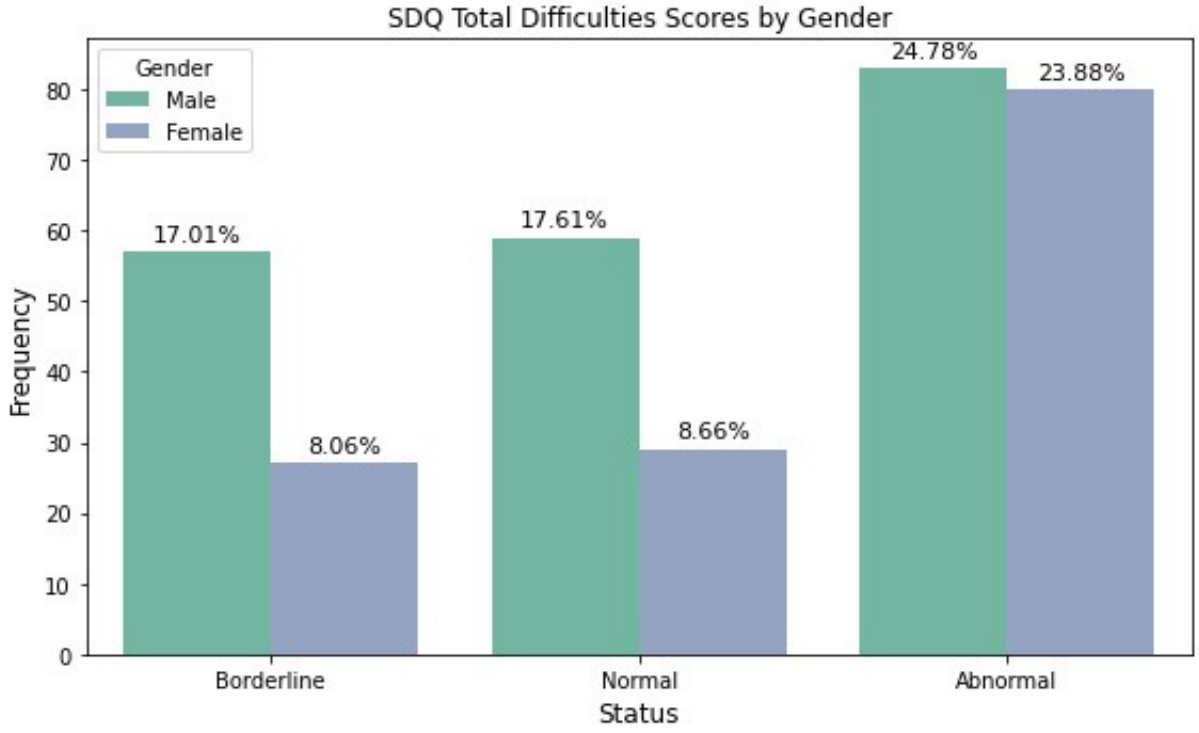
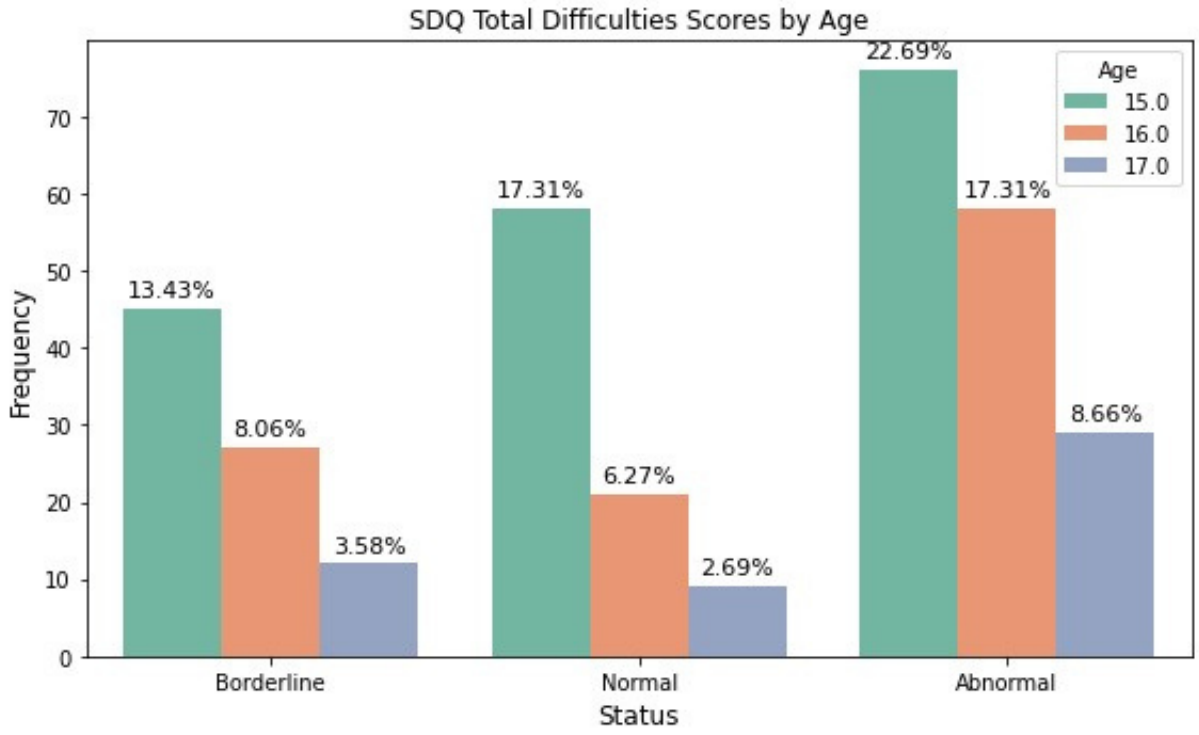


Fig.A31


SDQ Total Difficulties Scores by Age
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15.0
16.0
17.0
Frequency
0
10
20
30
40
50
60
70
13.43%
8.06%
3.58%
17.31%
6.27%
2.69%
22.69%
17.31%
8.66%
Borderline
Normal
Abnormal
Status

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