MASTER'S THESIS IN INTERNATIONAL SOCIAL WELFARE AND HEALTH POLICY OSLO METROPOLITAN UNIVERSITY

FACULTY OF SOCIAL SCIENCES

TITLE

Exploring the Mediating Role of Adolescent Mental Health in the Link Between Substance Use and Parent-Adolescent Relationship in Norway

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Acknowledgment

The master's thesis is the result of two years of studies, which has been an amazing experience. Being part of an international classroom of students with diverse backgrounds and academic backgrounds and studying in a different country with different cultures and lifestyles has opened my mind to new ideas, knowledge, and perspectives on societal drawbacks and health issues around the world.

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Abstract

Aim of the study: The main objective of this study is to explore the mediating role of adolescent mental health in the link between substance use and parent-child relationships, and the following research questions have been formulated; How does mental health mediate the link between substance use and parent-adolescent relationships in the Norwegian context? Does mental health mediate the link between family finances and parent-adolescent relationships in Norway?

Theoretical perspective: This study applies two theories, the ecological system framework of Bronfenbrenner, to analyze how the structure and the interconnected system of society influence has a direct and indirect impact on adolescent mental health and substance use and how each interconnected system contributes to the overall development of adolescents' well-being. The Attachment theory of Bowlby empirically demonstrates the impact of parent-child attachment on the overall well-being of adolescents and as a preventative tool against risky behaviors by adolescents which can affect their mental health.

Methods: Quantitative methods, including descriptive analysis, multiple linear regression, and mediation analysis. To investigate the research questions and hypotheses. The data used in this study stems from the cross-sectional study Ungdata 2021, which had an analytical sample of 2478 students.

Results: The findings show there was a significant negative impact of substance use (alcohol and drugs) on the parent-child relationships with mental health as the mediator. The direct impact shows that substance use by adolescents caused a decline in the parent-child relationship. Mental health mediates this relationship, this emphasizes its critical role in the link between substance use and family bond. Also, family finances show a significant positive effect on parent-adolescent ties with mental health acting as a mediator factor. The direct impact shows that generally good family finance is linked to a better parent-adolescent relationship and mental health also mediates this relationship.

Conclusion: Adolescents' mental health is associated with substance use, family finances, and their relationship with their parents. Adolescents from lower socioeconomic backgrounds or

who regularly engage in substance use often have the propensity to experience mental health issues, which can, in turn, negatively affect their relationship with their parents. This study suggests interventions targeting adolescent mental health could reduce the negative effect of substance use on family bonds.

KEYWORDS: Parent-child relationship, parents, substance use, family finances, mental health, depression, family bond, socio-economic status, Adolescence, Adolescents, Norway, Nordic countries.

1. INTRODUCTION

Previous research shows that parents play a significant role in mitigating and reducing substance use among adolescents. (Hurley et al, 2019). Adolescence is a transformative stage indicated by substantial physical, emotional, and social changes, making it vulnerable for adolescents. During this time, adolescents are confronted with lots of obstacles such as identity formation, peer pressure, academic stress, and the onset of mental health issues. Active involvement in adolescent's life such as being attentive to their education and being available for emotional support can lead to better academic performance, higher self-esteem, and improved mental health, keeping an eye on possible risk behaviors e.g., substance use, harmful online activities, and intervening when necessary is important, parents serve as role models exhibiting healthy adaptive strategy and positive behaviors can influence adolescent's choices (Povey et al., 2022).

Anxiety disorders, depressive disorders, and drug-related disorders are the three common health problems among the Norwegian population, more young people than the older have mental issues. Young adults who experience mental health problems are more likely to not finish school and also not participate in getting a job (Sommer, 2016, pp. 8-11). However, evidence regarding the importance of effective parental communication and monitoring and how it can be seen as a protective factor to mitigate the use of substances among adolescents is limited in the Norwegian setting. The adolescent stage can be seen as a fragile period for adolescents, most of them are susceptible to both bad and negative experiences which can, in turn, affect their mental health that can lead to substance use, and can also put a strain on parent-adolescent relationships.

Socio-economic inequalities are a pre-requisite topic of discussion in politics, social sciences, and public health research. Families with low socio-economic status often lack certain basic amenities than those with high socio-economic status, socioeconomic disadvantages do not only influence parents but also adolescents' lives (Reiss et al., 2019). Children's and adolescents' health relies on the socio-economic status of the family. According to Karlsen et al, there is a

link between low parental socio-economic status and a higher occurrence of social anxiety and mental health problems in adolescents

1.1 Research Purpose

This study aims to investigate and understand the complex interplay between adolescent mental health, substance use, and the parent-child relationship in the Norwegian context. Specifically, the study seeks to explore the mediating role of adolescent mental health in the link between substance use and the quality of the parent-child relationship, focusing on providing tangible insights into nuanced dynamics shaping the well-being of adolescents in Norway. Through an in-depth analysis, this research aims to contribute to the existing literature and enhance our understanding of the intricate factors influencing the mental health and substance use patterns of Norwegian within the family context. This is why I have chosen the following research questions.

1.2 Research Questions.

1.) How does mental health mediate the link between substance use and parent-adolescent relationships in the Norwegian context?

2.) Does mental health mediate the link between family finances and parent-adolescent relationships in Norway?

A quantitative method using descriptive statistics and linear regression will be employed to investigate the research questions. Data used in the study stem from the cross-sectional study Ungdata in Norway. The data consists of lower and upper secondary school pupils and was collected in Norwegian municipalities (NOVA 2022). Statistical analyses, including correlation, regression, and mediation analysis, will be used to explore the relationships between the following key variables.

Quality of parent-adolescent relationship (communication, support, supervision) (dependent variable)

Adolescent substance use i.e., alcohol and drug use are the independent variables, and adolescent mental health (the mediator variable). This approach will be presented in chapter 4.

1.3 BACKGROUND

Adolescence is considered a difficult stage in the transition process to adulthood and is characterized by significant mental and physical changes. In addition, individual, social, and contextual transitions also occur. In Norway approximately 10-20% of the adolescent population experience mental distress, meaning having symptoms such as depression, anxiety, and fatigue. About half of these have severe symptoms that develop a psychiatric diagnosis or behavior disorders (Øyfrid et al., 2018). Adolescence is an important stage for developing social and emotional habits for mental well-being. These include healthy sleep patterns, exercising regularly, developing coping and interpersonal skills, etc. Various factors affect adolescent mental health. High exposure to greater risk factors will result in a high impact on their mental health. Some adolescents are at greater risk of mental health conditions due to their Living conditions, stigma, discrimination exclusion, or lack of access to quality support and services. Also, exposure to adversity, pressure to conform with peers, and exploration of identity. (WHO, 2021).

The level of mental health symptoms and alcohol consumption are becoming common among adolescents. Adolescence is a sensitive stage for the development of substance use and misuse among adolescents. Adolescents' alcohol and drug use can cause academic issues, impaired driving, risky behaviors, and even risky sex, and substance use in adolescents foresees substance use disorders and antisocial activities in adulthood (Tara et al., 2014). Teenagers who often struggle with emotional problems often depend on alcohol or drugs to help them suppress difficult or painful feelings. The same can be said about adults but because adolescents' brains are not fully developed, self-medication will be the outcome. In the short term, substance use can help reduce health symptoms like anxiety, hopelessness, and negative thoughts. But in the longer run, it exaggerates them which leads to abuse and dependence (Miller & Taskiran, 2023). Young people with substance use problems are confronted with a high risk of mental health problems, such as depression, dysthymia, and anxiety also commonly

occur. Previous studies show that young people experiencing mental health issues are more addicted to drugs, with consistent displays of social problems and criminality. (Richert et al., 2020)

The drinking pattern of Norwegian adolescents, like their counterparts in the other Nordic countries is characterized by heavy drinking and an identical pattern is distinctive from other European countries (Johannessen et al., 2017). Cannabis use can be linked to mental health problems, failure to attend classes, difficulties with concentration, and reduction in motivation. Adolescents who use cannabis appear to be more vulnerable to adverse effects compared to adults. Norway has had a low number of adolescents using cannabis compared with many other European countries. However, results from the European School Survey Project on Alcohol and Other Drugs (ESPAD) survey showed that cannabis use in Norwegian 15-16 years was high around 2000, whereby 12% reported using cannabis in the past before it dropped to 6% in the period from 2007 to 2015. Cannabis use skyrocketed again from 2015 to 2019 with 9% of adolescents using cannabis. Recent results from the Ungdata survey indicate that cannabis use has increased significantly in illicit drug use among Norwegian higher education students from 2014 to 2018 (Heradstveit et al., 2021). Substances other than alcohol may be classified as cannabis, sedatives, analgesics, opioids, marijuana, and stimulants. Such substances are illicit in Norway unless used in a medical context. Illicit substance use has been strongly associated with depression, anxiety, and alcohol use.

Parental support and monitoring are some of the most important factors in reducing substance use and misuse among adolescents. Praising, encouraging, having conversations, and giving physical affection show that the child is accepted and loved, which might help in a child's overall well-being. In other words, children who have less experience of warmth and affection from their parents often exhibit negative emotions, are unable to handle stress, and often participate in harmful behaviors like missing classes, stealing, and misuse and use of substances. Parental support, such as having parents that have listening ears, and access to emotional support can be a protective factor against adolescents' anxiety which can be related

to various forms of substance use (Mills et al., 2021). Monitoring, which means being aware of their children's whereabouts and activities, is an important tool and a deterrent against alcohol consumption and other substance use among adolescents. Monitoring differs from parental support, monitoring can be defined as parents' knowledge of a child's whereabouts, while support refers to emotional availability and presence. Parental monitoring can reduce and prevent initiation among adolescents as well as reduce later drinking (Mills et al., 2021).

Parenting style is how parents treat, communicate with discipline, monitor, and support their children. These are the features of parents' behavior towards their children or offspring in different situations (Elstad & Stefansen., 2014). Parents are the foundation of the parent-adolescent relationship associated with adolescents' emotional and behavioral outcomes. Four parental styles are distinguished and associated with different outcomes. Authoritarian-autocratic parents tend to assert a lot of power, verbal aggression, and intimidating styles of control communication. Indulgent-permissive parents have low controlling behaviors, being incompetent at communicating regular expectations and boundaries for behavior. A neglectful parenting style is often associated with low response, and low demandingness, and tends to give little or no direction and guidance. Uninvolved parents tend to exhibit apathy in their teenagers and ignore their emotional and other needs. Authoritative-reciprocal parent styles are associated with adolescents' positive well-being and coping mechanism, emotional, and behavioral outcomes, combined with low power assertion. Monitoring and knowledge of a child's whereabouts have been associated with low levels of delinquency and harmful behavior (Williams, 2023, p. 59)

Parent-child communication is an important and protective factor for adolescent substance use. Better quality of general parent-child communication can reduce the likeliness of adolescents engaging in substance use. Conversely, adolescents who have trouble having discussions or communicating with their parents can lead to a high risk of adolescents engaging in substance use (Luk et al., 2009). Parental bonds affect persons throughout their lives and greatly affect other intimate relationships. Although adolescents often need more independence from their parents and place more value on their peers, the parents remain a pivotal source of communication (Arnarsson et al., 2019).

1.4 Definition of key terms

Substance use and abuse: Substance use can be defined as the use of any legal or illegal substances. Substance use is an extensive term that includes all forms and frequencies of using harmful substances (Gupta, 2022).

Health officials consider substance use as moving into substance misuse if continuous use causes impairment, such as disabilities, failure to meet responsibilities, impaired control, risky use, and social issues (Buddy, 2023).

Mental Health: According to WHO mental health is a state of mental well-being that enables people to cope with the stresses of life, realize their abilities, learn well, work well, and contribute to their community. Mental health includes emotional, psychological, and social well-being. Mental health is more than the nonexistence of mental illness, it is a prerequisite for overall health and quality of life. It is a vital component of health and well-being that supports individual and collective abilities to make decisions, build relationships, and shape our world. Mental health is a basic human right and important to personal, community, and socio-economic development (WHO, 2022).

Mental health is about how people think, feel, and behave. Mental health is the foundation that can affect a person's day-to-day life, relationships, and physical health. External factors in people's lives and relationships can also contribute to their mental well-being (Felman & Tee-Melgrito, 2024).

Parent-Adolescent Relationship: Parenting style is defined as the combination of parents' attitudes, values, beliefs, and behaviors toward children and an emotional platform in which the parents' behaviors are expressed (Bi et al., 2018). Parent-child relationships are very crucial for the proper development of a child. Adolescence is a period of rapid biological, cognitive, and neurological changes that significantly affect psychosocial functioning and relationships. (Branje,2018). The parent-child relationship is dynamic and evolving one that changes as youths seek independence from their families, sometimes this process can cause emotional friction

and tension, cultural contrast, and conflicting desires between parents and teens, however, parents can also help teens to navigate the challenges and risks that adolescence presents by having proper communication with their teens and providing guidance and support

2. Literature Review

This review is based on published studies from six database sources between 1996 – 2024: CINAHL (EBSCO), Academic Search Ultimate EBSCO), E-book collection (EBSCO), SOCINDEX (EBSCO), MEDLINE (EBSCO), and Google Scholar. Peer-reviewed studies written in English were selected. The search included the following combinations of keywords: “parent” or “parent-adolescent relationship” or “adolescent” or “youth” or “teen” with the words “mental health” or “anxiety” or “depression” or “mental illness” or “substance use” or “substance use disorder” with “Norway” or “Nordic countries” or “Finland” or “Sweden”. Studies from other European countries were included to strengthen and support findings from European studies. Studies were included if they used a quantitative or qualitative design, had a sample of children aged between 13-18 years, and estimated the association between parent-child communication or parenting styles and substance use (alcohol and drug use) and mental health among adolescents—studies which identified substance use disorders and mental health outcomes by a reliable, valid, and formal assessment.

2.1 Parent-adolescent Relationship

Kreppner & Ullrich reviewed the quality of parent-parent communication in the family and its impact on Adolescents' development. A longitudinal study that investigated changes and continuities in the quality of communication between parents during the period when the oldest child in the family passes through the transition from childhood to adolescence discovered that in general, parental communication showed changes in quality during the child’s critical development period (Kreppner & Ullrich., 1997). Parental communication can be a platform for dealing with and solving misunderstandings. The quality of communication between parents reflects the family’s surroundings in which the child has been raised and in which he or she must manage the transition from childhood to adolescence (Kreppner & Ullrich

1997., p. 4). However, Ennett et al, 2001 explored parent-child communication about adolescent tobacco and alcohol use: what do parents say, and does it affect youth behavior? They found that communication style, i.e., how the information has been passed through, is an important part of the communication process. Open communication between parents and adolescents can be linked with a reduction in drug and alcohol use among adolescents (Ennett et al 2001, pp.60).

Open communication involves providing an atmosphere where children feel comfortable sharing their thoughts, feelings, and concerns without fearing criticism. Open communication makes children feel supported and understood, creating a healthy parent-child relationship (Sherwood, 2023). Effective communication, which signifies a quality parent-child relationship, is essential in my study in investigating how a good parent-child relationship affects the psychological well-being of a child. Effective communication between parents and adolescents might mediate the relationship between mental health and substance use, possibly acting as a protective factor.

Branje et al 2008 reviewed the reciprocal development of parent-adolescent support and adolescent problem behaviors and found that parents are an important source of support. Arnarsson et al., 2019, assessed the time trends in Nordic adolescents' communication with their parents. They found that effective communication and support shape parent-adolescent relationships in Norway, easy communication between adolescents and their parents increased from 2002 to 2014. Positive changes in parental communication were pronounced among Nordic fathers, especially in Norway, which was the first country to enact a fathers' quota. However, mothers exhibit better communication with their adolescents than fathers.

Filus et al (2019) analyzed parenting and late adolescents' well-being in Greece, Norway, Poland, and Switzerland: associations with individuation from parents, the findings show that in all four countries, adolescents' granted autonomy was positively linked with adolescents' well-being. This study aligns with (Kocayörük et al., 2015) that, the parenting atmosphere contributes to a place that fosters adolescents to cultivate the habit of self-autonomous, which leads to the healthy development and well-being of adolescents. Adolescents who feel they are

strongly related to their parents and autonomous have more options to pursue their interests and to be better adjusted compared to those who are not satisfied with their parents.

Carver et al., 2017, examined the parent-child connectedness and communication about substance use concerning alcohol, tobacco, and drug use in adolescence. Their findings show a good quality parent-child connectedness and communication are protective against adolescents' alcohol, tobacco, and drug use. When the parent-child connectedness is low, parent and child communication will be affected (Carver et al., 2017). The relationship adolescents build or have with their parents and "peers" is one of the many reasons for the increase in substance use among adolescents. Adolescents who spend time with friends who use substances can increase substance use among adolescents. Authoritative parenting and high parent involvement, support, or monitoring can alter the use of substance use among adolescents and hinder initiation and continuation (Tornay et al., 2013). The above studies show that strong parent-child connectedness and communication can be a protective factor against substance use. In my study, I could hypothesize that the quality of the parent-adolescent relationship moderates the effects of mental health on substance use with stronger relationships reducing the likelihood of substance use or poor mental health.

A study indicates that a lack of parental control or supervision leads to adolescents getting involved in substance use. According to (Ennett et al 2001, p. 59) Weak parental control is also associated with problem behaviors, whereas parents who exhibit reasonable limit-setting and warmth appear to be associated with less substance use. Parental support and supervision or responsiveness and demandingness combined can be called a parenting style "authoritarian parenting" which can be effective and protective in stopping adolescents from engaging in substance use. Communication between parents and adolescents on substance use could explain the protective effects of parental support and supervision (Ennett et al 2001, p. 50).

Given the studies presented above, the parent-child relationship is of great importance in a child's life, a good parent-child relationship is of great benefit to a child in the long run and can be a protective instrument against risky behaviors. Adolescents' substance use can place youth at risk of a range of poor outcomes. It is important to recognize the fact that family influences

do not occur alone, there are other determinants of drug and alcohol use and misuse, including intra-personal factors, peer influence, and the wider community. Parent-child bonds can be seen as a tool that can prevent risky behaviors among adolescents in addition to an effective parenting style with effective parental monitoring and good parent-child communication to encourage a child's openness (McLaughlin, 2016). Thus, it is safe to say that parents who exhibit the authoritarian parenting style i.e., show warmth, good limit of monitoring and control, good communication, and support to their children can be a protective factor against substance use compared to the authoritative parents. Children whose parents care about them, monitor their whereabouts and friendships, and use effective discipline contribute to the self-control that is associated with less involvement in risky behaviors, such as alcohol and drug use. (Mayberry et al., 2009).

Consequently, if we want to understand the association between good parent-child relationships (Communication, supervision, monitoring, and support), we need to consider the association it has with other variables. In this master's thesis, I may focus on parent-child relationships and substance use with other variables like gender, socio-economic status of the parents, and mental health.

2.2 Cultural and Contextual Influences

It is imperative to identify cultural and contextual factors that may have an impact on parent-child relationships. Some cultural and contextual factors might promote and maybe hinder good parent-child relationships in Norway which is characterized by a strong welfare state. Culture can be defined as a concept that entails social behavior, institutions, and norms found in human societies, as well as the knowledge, beliefs, customs, capabilities, and habits of individuals in these groups.

Culture is an extensive term that can be used differently depending on the field of study. It is a multidimensional concept that different issues like gender, class religion, language, and nationality have impacted. Cultural diversity has a strong impact on several aspects of mental health which starts from how health and illness are perceived, to health-seeking behavior, and attitudes of the consumer and the practitioners and mental health systems. Culture has an

impact on what gets defined as a problem, how the problem is understood, and which solutions to the problem are acceptable (Gopalkrishann, 2018). Culture plays a central role in shaping individuals' expectations and behaviors related to substance use and abuse. Different cultural groups establish distinct codes of conduct regarding drugs and alcohol. For instance, what is considered illegal is different across cultures and social groups.

The welfare state in the Scandinavian region is generally committed to an egalitarian system (Bendixsen et al., 2018). For example, Norway has strong parental leave policies that encourage both parents to actively participate in childcare. Publicly subsidized childcare and parental leave quotas for both maternity and paternity leave periods contribute to a strong foundation for parent-child relationships (Indregård, 2022). Gender equality has become an important ethos and part of the nation-state, particularly in Norway and Sweden (Bendixsen et al., 2018). This cultural norm affects parent-child relationships by promoting equal involvement of both parents in caregiving, decision-making, and nurturing (Indregård, 2022). Research has shown that communication between Norwegian parents and children during play interactions is similar between mothers and fathers. Features such as responsive communication, levels of abstract talk, and language complexity are analyzed along three dimensions: Interactional, conceptual, and linguistic (Ingregård, 2022).

Elstad and Bakken 2015 found that low parental income can hinder children's school, particularly in families with the lowest income. This suggests that economic factors can influence the parent-adolescent relationship (Elstad & Bakken, 2015). Norwegian reports have documented the relationship between family income and offspring's educational achievement both for lower secondary school and higher education. Higher socioeconomic status (SES) can be a resource for parent-child relationships. In terms of parenting style, parents from high SES are more likely to be more accommodating and less punishing while parents from low SES show more control and restrictive parenting. The parenting style of low-income families is often categorized by less affection and harsh punishment, family wealth and parent-child relationships are linked to family investment, due to the increase in wealth, families can invest

their wealth in their offspring through engagement, communication, and supportive action, which makes it easier for their children to adapt through life (Ramdahl et al., 2018)

Previous studies have shown that adolescents who perceived their parents as psychologically controlling were less interested in the future and more diligent and more pleasure-seeking than others. In contrast, adolescents who perceived their parents as more responsive to their needs were granted more autonomy or independence, and controlling behavior was more future-oriented and diligent than others (Nyhus & Webley, 2013). Nyhus & Webley, assert that the economic socialization of parents and adolescents can play a huge role in the parent-child relationship.

Haavik et al (2019) explored the effect of gender on help-seeking for mental health problems in an adolescent population with a web-based survey using vignettes, open-ended, and multiple-choice items directed to upper secondary school students in two counties in Norway. 1249 students completed the survey with an 88% response rate and an average age of 17.6 years and 56% were females, the females were better at identifying psychological problems of anxiety and trauma, and awareness of mental health services and recognized more barriers to seeking help. However, education had more impact on mental health services than gender (Haavik et al, 2019). In Norway, local mental healthcare services are available to adolescents, such as school nurses/counselors' services at adolescent health centers, and services at the adolescent health centers. The stigma associated with having a mental disorder is an obstacle to effective care regarding mental health problems. Adolescents who conceive the mental illness stigma are less likely to ask for help or care. Research on middle and older adolescents suggests that mental health stigma among adolescents is associated with gender being male (Tharaldsen et al., 2017).

2.3 Adolescent Mental Health as a Mediator between parent-child relationship and substance use

Mental health problems are one of the biggest challenges in Norway. Mental ill health in Norway is often called mental disorders, and half of the Norwegian population has experienced

it during their life. Findings from NOVA youth research surveys show that there has been an increase in the number of young people with symptoms of mental health problems. Anxiety disorders, depressive disorders, and drug-related disorders are the three most common groups of mental disorders among the Norwegian population, specifically, more young people experience health problems than young people. These disorders are an obstacle to education and participation in the labor market (Sommer, 2016).

Positive mental health among adolescents' hinges on the quality of parent-child relationships. Studies in the past have proven that a better relationship between parents and adolescents improves the overall well-being of adolescents. For instance, warm and cohesive family relationships provide social support and resources that can help prevent adolescents from engaging in risky behaviors and help them face the challenges that come with adolescent life (Chen & Harris, 2019). Positive mental health is an important part of youth's development, good physical health, closer relationships, and fewer conduct problems can be linked to good mental health (Capaldi et al., 2021).

Using Discrete-Time Survival models, Rusby et al 2018, analyzed the influence of parent-youth relationships, parental monitoring, and parental substance use on Adolescent substance use onset. The findings show that the youths who have poor parent-youth relationships and lower parental monitoring were more prone to alcohol use, binge drinking, and the use of marijuana. Poor relationship between parent and youth affected the girls more than the boy's alcohol use onset, while proper parental monitoring had a better effect on girls than boys for both alcohol and marijuana use onset (Rusby et al., 2018). Research studies have some support for the efficiency of family-based programs in reducing the use of substances including marijuana. The program addresses family-related risk factors, such as family conflict and strict discipline as well as protective factors, such as parent-child bonding and parenting monitoring. The GGC (Guiding Good Choices) is a family-based substance use prevention program where parents attend four of the five sessions alone to promote parent-child bonding which increases the chances of positive youth involvement in the family, helping adolescents acquire skills for positive family involvement, learning how to praise adolescents for positive behaviors and giving the proper discipline for negative behaviors. Adolescents attend with their parents in one of the sessions

which give adolescents' skills and training related to coping, problem-solving, anger management, and substance use refusal skills (Compton 2016, p. 210).

Substance use among adolescents has been an issue for decades, (Jacobsen, 2020) examined the association between mental health, subjective income status, perceived parental and peer support, and substance use in Icelandic college students; the regression method was used to investigate the association between substance use and all variables and there was a positive relationship between all variables and substance use. Having good mental health, receiving parental support, and coming from a home with average or higher income were all protective factors for substance use while peer support appeared to be a risk factor. However, the result reveals how essential it is to support adolescents' who have a poor family background, lack support from parental figures, or are battling with mental illness. Studies have indicated that young people in low-income families tend to experience worse mental health issues than children and young people in the rest of the population, no less than 34% of young people in families with poor advice report depressive symptoms come from people in families with low incomes (Sommer, 2016).

According to (Skogen et al., 2014), Alcohol problems and mental health problems are likely to occur in the adolescent stage. It shows that there has been an association between substance use and mental health problems. Alcohol and drug use and drug problems are continuously associated with symptoms of mental health problems. Debut alcohol and drug use were associated with symptoms of depression, inattention, and hyperactivity, while drug use was linked with increased symptoms of anxiety. People take drugs for psychological and physical reasons. Psychological issues, including mental issues, and traumatic experiences. Several factors can add to emotional and psychosocial stress, which leads one to get involved in drug use or misuse. People with mental disorders, such as anxiety, depression, and PTSD are more likely to have a high intake of alcohol as a form of self-medication. Some of the substances can help with mental disorders temporarily, at other times it might make it worse. People with mental health disorders can cause initiation in drug and alcohol use which might increase the continuity of substance use (Substance use and co-occurring mental disorders).

2.4 Substance Use Among Norwegian Adolescents

Adolescence is known as a vulnerable period whereby certain unhealthy behaviors that often place their health in harm's way and can lead to adulthood disorders usually start from an early stage. Risky behaviors such as drinking, smoking, and illegal drug use. Unemployment, poor health, accidents, suicide, mental illness, and decreased life expectancy have a trace of drug use and abuse as a major common contributing factor. However, certain factors promote the risk for substance use or abuse like socioeconomic status, quality of parenting, peer group influence, etc., (Das et al., 2016).

Substance use encompasses a wide range of behaviors related to the consumption of various substances. According to Schaeffer's model, patterns of substance use include experimental, which means people who use drugs for a short period—recreational or social, an individual who uses drugs or alcohol in a social environment. Situational, uses a drug for specific circumstances, such as recovery from surgery or after an injury. Intensive, is a person who usually takes a high dosage of drugs or alcohol and binges. Compulsive, which means addiction and being dependent on drugs or alcohol (Granite Recovery Centers, 2023).

Substance use can vary widely, not everyone who uses substances becomes addicted. Factors like genetics, mental health, environment, and individual choices play a role in determining the trajectory of substance use. Stringent alcohol and drug rules have been implemented in Norway. Restriction on age limits for the purchase of alcohol, high prices, limited availability of alcohol, and fines or imprisonment punishment for drug related. Additionally, recreational centers that sell drinks will be apprehended and get their license revoked if they serve alcohol to those under-aged or people intoxicated by alcohol and drugs may have their liquor license revoked. It is a crime to purchase, sell, use, and own illegal drugs, including cannabis (Jørgenrud, 2021).

Velleman et al reviewed the role of the family in preventing and intervening with substance use and misuse. The review concludes that there is a dearth of god sound research in the methods area. However, the research that has been conducted does suggest strongly that the family can

have a central role in preventing substance use and later misuse amongst young people (Velleman et al., 2005). Also, Clausen examined the parenting styles and adolescents' drug use behaviours and discovered that the combination of a low level of caring and a high level of protection conceptualized as affectionless control was associated with drug use among adolescents (Clausen, 1996). The above studies have highlighted the importance of family and parenting style on the initiation of drug use among adolescents which is also relevant in my study, the family and parenting styles of both mother and father are the foundation for the overall well-being of a child. The quality of the parent-child relationship i.e. communication, monitoring, and supervision, and if these characteristics will prevent adolescents from engaging in these risky behaviors that might have possible effects on their health will be explored in this study.

Increasing levels of mental symptoms and alcohol consumption are features of normal development during adolescence. Johannessen et al., 2017 investigated anxiety and depression symptoms and alcohol use among adolescents (Norwegian secondary school students). From the findings, higher levels of depression symptoms were associated with earlier onset of alcohol use, more frequent consumption, and intoxication. The associations between anxiety and depression symptoms and early drinking onset were more significant for girls than boys (Johannessen et al., 2017).

2.5 Family Finances and Adolescent Development

The presence of unequal opportunities and rewards for different social positions or statuses within a group or society is one of the most prevalent discussed topics in Europe and the world. The increased margin between the socioeconomically advantaged and disadvantaged people has steered an in-depth debate in the social sciences and politics. These discourses have been characterized by the duplication of social differences across generations, which attenuates the opportunities for social mobility within distinct population groups throughout life. Poverty and low socioeconomic status influence different areas of social life, including access to education, income distribution, health status, and healthcare utilization (Reiss, 2013). The socioeconomic

status of a family is linked with mental health, those raised in families with poorer socio-economic status are more likely to develop mental health problems compared to their more advantaged peers (Bøe et al., 2017). The socioeconomic status of a family can be measured in different ways but most include family income, parental education, and occupational status (Bradley & Corwyn, 2002).

Tormod Bøe 2013, investigated the socioeconomic status and Mental Health in children and Adolescents. Detailed investigations of how indicators of socioeconomic status are associated with different domains of mental health problems were utilized, and data from a large sample of 11-13-year-old children who participated in the Bergen Child Study were used. The findings suggest that mental health problems are distributed according to familial socioeconomic status, with more problems for those who are socioeconomically disadvantaged. Bøe et al 2018 examined the interplay of subjective and objective economic well-being on the mental health of Norwegian adolescents. Using a sample of 9000 adolescent participants from the youth@hordaland study, the research shows moderate associations between perceived economic well-being and household income and the influence of perceived economic well-being on mental health problems depending on the level of household income. From these established studies, it is essential to note the undeniable effects of a family's socioeconomic status on the development of an adolescent, which will be an important variable in my analytical models for this study.

Myhr et al investigated the trends in socioeconomic inequalities in Norwegian adolescents' mental health from 2014 to 2018: A repeated cross-sectional study. The research indicates that socioeconomic status significantly impacts adolescents from lower socioeconomic backgrounds experience higher levels of psychological stress, including symptoms of depression, anxiety, and loneliness. However, these disparities were consistent over time, with girls showing higher rates of distress compared to boys (Myhr et al., 2020). From previous studies, the family's socioeconomic status plays a major role in a child's growth, especially in their mental health. However, this might differ in both boys and girls. In my study, I could explore the impact of a family's socioeconomic status on adolescent mental health controlling for gender.

A few studies have found that adolescents with low SES have a greater propensity towards substance use during adolescence. Daniel et al., 2009 examined if socioeconomic status in early life is associated with drug use. Results show that there was a consistent association between lower childhood SES and later drug use, primarily cannabis use. Hanson 2007 examined socioeconomic status and substance use behavior in adolescents: The role of family resources versus family social status. Findings from the research reveal that adolescents from higher socioeconomic status were more likely to use substances than low SES teens. Family resources were a stronger predictor of substance use than family status. From these findings, the socioeconomic status of a family does not only impugn the mental health of a child, but it can also lead to risky behavior like substance use (Hanson, 2007). Substance use and mental health are interdependent terms that can influence each other. However, the association between socioeconomic status and substance use among adolescents will be analyzed in my analytical models.

Family is the foundation for adolescent development and the influence of parenting style on adolescents can determine a child's overall well-being. Monitoring can be defined as concern and being aware of children's whereabouts. According to Mills 2021, parental support and monitoring can be seen as protective tools against adolescents' engaging in substance use (Mills, 2021). So far, this chapter has discussed the findings of past studies, which show that there are various such as economic resources, peer pressure, and gender that can affect parent-child relationships and lead adolescents into substance use which can also affect their mental health. This has given me knowledge of the theories that will be suitable for this study. The literature has indicated interventions for substance use and misuse, and mental health problems among adolescents that need a broader scope. A suggested intervention and theoretical framework for this study will be discussed in the following chapters.

3. Theoretical Framework

In this chapter, I will explain the theoretical ideas which I will use to interpret the data. The ecological theory and the attachment theory have been used to explain parent-child

relationships and how it has contributed to their overall well-being. I will first present the ecological system theory from the perspective of Bronfenbrenner on how a child's development within the context of an interconnected system of relationships forms his or her relationships. Then, I will elaborate on the attachment theory by Bowlby, and how parental attachment can help reduce risky behaviors or criminal activities among adolescents.

3.1 Ecological system theory

The ecological systems theory provides a lens through which we can understand the importance of healthy parent-adolescent relationships in the context of substance use. It emphasizes that adolescents are embedded with multiple interconnected systems: microsystems (such as family) and mesosystems (interactions between microsystems), exosystems (external environments), and macrosystems (cultural and societal contexts).

Bronfenbrenner's ecological systems theory indicates that the development of an individual is affected by a series of interconnected environmental systems, starting from the immediate surroundings e.g., family to broad societal structures e.g., culture. These systems include microsystems, mesosystems, exosystems, macrosystems, and chronosystems, each presenting different environmental influences on an individual's growth and behavior (Guy-Evans, 2024).

The theory focal point is the relationship between people and the environment, which means there is an interdependency. Bronfenbrenner proposes that better developmental outcomes depend on a more nurturing and encouraging environment (Cherry, 2023). According to Bronfenbrenner, human development within bioecological theory is defined as the continuous growth and change in the psychological traits of individuals and groups (Bronfenbrenner, 2005, p.28). The microsystem includes the child's most immediate relationships and environments—for example, a child's parents, siblings, classmates, teachers, and neighbors. Relationships in the microsystems are bi-directional, which means other people can also influence the child in their beliefs and influence their beliefs and actions. The interactions a child has with the immediate environment have an indirect impact on them. The mesosystem involves the interaction between different microsystems in a child's life, for example, between family and teachers or between the child's peers and family (Guy-Evans, 2024). Mason et al,

2016 examined parents, peers, and places: Young Urban Adolescents' Microsystems and substance use, from the findings indicated that peer networks have important interactions with family relationships that influence substance use which is particularly important for those who stay in risky environments. Joo Lee & Sang Yoo 2015, investigated the family, school, and community correlates of children's well-being. An international comparative study shows that the microsystems which are the family, school, and community have an impact on the overall well-being of adolescents. The nature of children's immediate surrounding relationships such as the frequency of family activities, frequency of peer activities, and neighborhood are most consistently related to a child's well-being. Family is one of the key factors to predict the well-being of adolescents, positive family experiences influence children's well-being and vice versa. Previous studies have shown the effects of microsystems and their direct impact on a child. These studies demonstrated the importance of a good relationship with family, peers, or a good neighborhood can shield the negative impacts on adolescents' lives. However, in this study, the family will focus on adolescents' development and its effects on their mental health and substance use.

The mesosystem involves the interaction between different microsystems in a child's life, for example between family and teachers or between the child's peers and family. Previous studies have shown the parental and peer influences on the risk of adolescents' drug use, the results show that peer drug use relatively had a strong effect on adolescent drug use. Parental drug attitudes, sibling drug use, and adult drug use had significant direct effects net of peer influences (Bahr et al., 2005).

Exosystems involve other formal and informal social structures, it does not directly interact with the child, and the exosystems influence the microsystems. For example, an adolescent's experience at home may be influenced by their parents' experiences at work. Public policy, maternal/parental employment all these can result in their patterns of interaction with their child. Askeland et al, 2004, examined Parental unemployment and educational outcomes in late adolescence in Norway, from the findings show that adolescents with parents outside of the workforce have a higher chance of dropping out from school than their peers with parents who are employed. Previous studies have shown the effects of exosystems on a child's development,

well-being, education, etc., which can influence the patterns of interaction between a child and the parent. However, in this study family finances will be part of the variables to examine if this has an impact on the mental health and substance use behaviors among adolescents in Norway.

The Macrosystem does not refer to the environments developing the child but the already established society and culture in which the child is developing, for instance, beliefs about gender roles, etc., Gender equality has become a symbol and part of the self-representation of the nation-state particularly in Norway and Sweden. (Bendixsen et al., 2018). This cultural norm affects parent-child relationships by promoting equal involvement of both parents in caregiving, decision-making, and nurturing (Indregård, 2022). Research has shown that communication between Norwegian parents and children during play interactions is similar between mothers and fathers. Features such as responsive communication, levels of abstract talk, and language complexity are analyzed along three dimensions: Interactional, conceptual, and linguistic. This open communication style fosters a positive parent-child relationship (Ingregård,2022). Chronosystem refers to shifts and transitions over the child's lifetime (Guy-Evans, 2024).

Building strong parent-adolescent relationships is crucial for supporting adolescents during this critical developmental stage. Analyzing interactions within contexts can extend our knowledge of adolescents' substance use. Previous studies have shown how the influences of family, peers, neighborhood, school, parental employment, etc. However, there are limited studies, especially in Norway that have assessed the impact of the family. Especially, the impact of the parent-child relationship on mental health and substance use behaviors among adolescents.

Ecological system theory can be used to identify mechanisms of adolescent substance use, ecological systems are particularly salient to identifying actionable mechanisms of adolescent substance use. By adopting the Bronfenbrenner model this study seeks to explore how the parent-adolescent relationship functions within a larger context influencing adolescents' mental health and substance use behaviors.

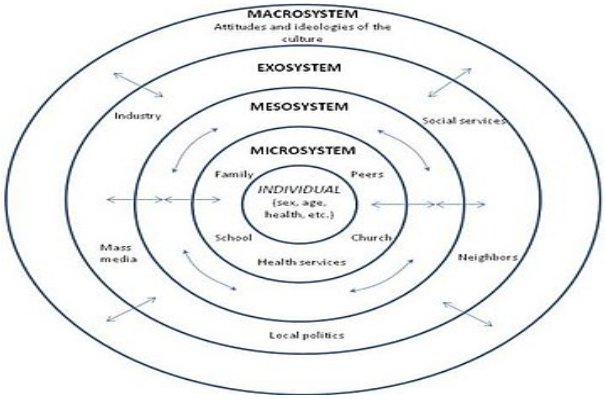

Figure 1. Bronfenbrenner's nested model. Extracted from Wikipedia

Research has proven that family is the backbone in determining the beginning of healthy and unhealthy development in adolescents. Positive parental attachment, caring, support, monitoring, and values also play a significant role in explaining the role in explaining adolescents' attitudes and behaviors. The ecological perspective of Bronfenbrenner has been used effectively to conceptualize the various socialization contexts of child development. The Ecological approach emphasizes the view that no one social context can be separated from the other. Interconnections between the family and surrounding social contexts must always be considered (Bush & Peterson, 2013).

3.2 Attachment Theory

Bowlby's work on the attachment theory cannot be discussed without the influence of Lorenz's study of imprinting. Lorenz Experiments, which states that when the eggs hatched, the gosling saw him as the first moving object, and they immediately followed him as if he were their mother. Lorenz called this process 'filial imprinting', which means the gosling recognized him as their parents and they immediately formed a bond with him. Lorenz believed that attachment was built in young ducklings, and they therefore had survival value. Bowlby believes that attachment behaviors such as proximity seeking are automatic and can be activated by any circumstances that will be an obstacle in achieving proximity, such as separation, fear, and insecurity. Babies are born with the propensity to exhibit certain behaviors called social

releases to get in contact with their caregiver like crying, crawling, and smiling. The determinant of smiling is not food but care and responsiveness (Mcleod, 2024).

Attachment is one of the in-built motivational systems that allow survival advantage. It has behavioral, adaptive cognitive, and psychological components. The main objective is that accessibility and proximity are attainable to a discriminated primary caregiver which gives the child protection (Survival function) and a feeling of security (Psychological function) (Karbowa-Polwens, 2021). Mclaughlin et al 2016 examined "Adolescent Substance Use in the Context of the Family: A Qualitative Study of Young People's View on Parent-child Attachment, parenting style, and Parental Substance Use". The findings show that parent-child attachment was identified as an important factor in protecting adolescents from the substance, in addition to effective parenting style, particularly an authoritative style in combination with proper parental monitoring and strong parent-child communication to enhance child openness. Family substance use also influences adolescents' substance use especially if they are exposed to it at a very young age. Less is known however about the links between parent-child relationship, adolescents' mental health, and substance use especially in Norway. Most studies have examined parenting style, family conflict, and parents' substance use. Consequently, there has been a call to examine the potential role of the parent-child relationship and its impact on adolescents' mental health and substance use.

Attachment described as an affectional bond is a close emotional bond between a weaker and less experienced individual. Another stronger/wiser bond is formed between a child and a care provider. Bowlby focuses on the relevance of emotions that stem from parent-child attachment in attachment relationships. Joy and a sense of security when proximity with a caregiver is stable. Jealousy, anger, and anxiety once it has been threatened, and sadness, grief, and depression when the bond is broken. Positive effects are associated with attachment relationships while negative effects accompany loss or threat of loss which drives the child to maintain this relationship and alert the caregiver to the child's interest in maintaining the relationship.

An examination of the parent-child attachment/relationship about substance use literature supports the idea that several aspects of parent-adolescent relationships are the key predictors of adolescent substance use, for instance, Branstetter et al., 2009 investigated the influence of representations of attachment, maternal-adolescent relationship quality and maternal monitoring on adolescent substance use: A two years longitudinal study, the findings shows that higher levels of security in attachment styles had an indirect effect on changes in substance use over time, meditates by maternal monitoring (Branstetter et al., 2009). Unfortunately, the relationship between a parent-child relationship substance use and adolescent mental health has not been studied simultaneously in the same study. This present study sought to examine how a quality parent-child relationship relates to their mental health which often leads to risky behaviors like substance use, and if adolescents' mental health mediates the link between parent-child relationships and substance use.

Infants and young children need to experience warm, intimate, and continuous relationships with their caregivers, in which they both find satisfaction and enjoyment in growing up healthy and developing proper personality functioning (Karbowa-Polwens, 2021). Fear of separation from the caregiver can lead to dysfunctional social behaviors that come from a lack of consistent, supportive, nurturing attention from parental figures. Additionally, children become healthy, stable individuals within a warm, reciprocal, and abiding relationship with their significant other (Jane Coy, 2019). Agerup et al studied the Associations between parental attachment and the course of depression between adolescence and young adulthood. The findings indicated that insecure attachment relationships with both parents were associated with the course of depression. Less secure attachment with both parents was associated with becoming well and remaining depressed. The attachment theory emphasizes the importance of a child being attached to his/her caregiver and its effects on a child's overall well-being. This study seeks to explore the influences of the parent-child relationship on a child's mental health and substance use behaviors and hopefully contribute preventive measures.

Based on my theoretical discussions and previous findings, the following hypotheses have been formulated.

HYPOTHESES

HO: Adolescents' mental health will not mediate the relationship between substance use and the quality of the parent-adolescent relationship.

Previous studies have shown the relevance of a quality parent-child relationship in the overall well-being of adolescents and be a protective factor against risky behavior. According to the ecological systems theory, adolescents' well-being and behavior are highly influenced and impacted by the interconnected systems of society such as peers, family, schools, and the larger social context. The attachment theory emphasizes the importance of the parent-child bond, which is the backbone of an adolescent's overall well-being and can moderate the effects of substance use. Which this hypothesis seeks to test.

H1: There will be a significant relationship between a quality parent-child relationship and substance use among adolescents in Norway.

From the attachment theory, a quality parent-child relationship is the backbone for emotional support and security for adolescents' which can reduce substance use. The ecological systems theory supports this by stating that positive family surroundings act as a protective tool that can deter adolescents against external risk factors like peer pressure toward substance use. This hypothesis expects that a quality relationship will have a negative relationship with substance use, as envisioned by both theories.

H2: There will be no significant relationship between family finances and quality parent-child relationships.

Previous findings have shown the importance of family finances on the effect of the family, and how it can positively or negatively depend on the socio-economic status, affect the development of adolescents. Daniel et al., 2009, examined if socioeconomic status in early life is associated with drug use. Results There is a link between adolescents from families with low SES and drug use, especially cannabis. The ecological systems theory suggests that socio-economic factors, like the family financial situation, which belongs to the exosystem can indirectly have an impact on family dynamics. The attachment theory emphasizes more on a

quality parent-child bond than financial stability alone. By exploring this hypothesis, I analyze whether economic factors have a direct impact on a parent-child relationship, or if the parent-child bond remains will not be affected by financial status.

4 Method

4.1 Data

The data material used in this thesis is drawn from the report Ungdata codebook, 2010-2021. The Ungdata surveys are conducted annually across most Norwegian municipalities. They are an essential source of information on young people's health, well-being, attitudes, and behaviors across various areas. Norwegian Social Research (NOVA) at Oslo Metropolitan University is responsible for the surveys in collaboration with Regional Drug and Alcohol Competence Centres (KoRUS). The surveys are financed partially by the Norwegian Directorate of Health. The present study was based on results from the Ungdata survey conducted in 18 Norwegian Municipalities, which in 2021 was completed by 9784 Norwegian high school students (grade 11-13, age range 16-19 years). The students agree by answering the questions in the survey. The consent takes place after the student has been informed about the survey. The schools provide information about the purpose of the survey to pupils who participate in the survey. Students who decide in school whether they wanted to participate after being informed that participation was voluntary and that they could skip questions that they did not want to answer or end the survey along the way, without giving a reason. The study was conducted as a web-based questionnaire administered during school hours with a teacher or administrator present to answer questions. (Nova, 2022).

4.2 Ethical considerations

The survey adhered to the principle of anonymity. However, more detailed information was collected from participants in higher secondary schools, which could theoretically allow for indirect identification. However, the data made available by NOVA for the present thesis only

compromise a subset of the variables in the original file, making such identification unlikely. NOVA processes the information based on the consent of those who participate. The survey was answered voluntarily, participants under the age of 18 had consent from their parents. NOVA uses services for sensitive data (TSD) that meet the strict legal requirements for processing and storing sensitive research data. (Bakken, 2018).

4.3 Variables Included

Questions in a survey can be interpreted differently by the respondents and the method can be criticised for its biased nature and low level of accuracy. Reliability refers to the same pattern of a measure and validity refers to whether the indicator measures what it is supposed to measure (Bryman, 2012, pp. 169-179). More information about the included variables is presented in the following sections.

4.3.1 Dependent variable

Relationship with parents- The questions comprised the quality of the relationships based on communication, monitoring, controlling, and support. For this study, 10 statements were chosen that best fit a good parent-and-adolescent relationship. Ten questions on a 4-point Likert scale ranging from 0 (fits very badly) to 3 (fits very well) to indicate the extent to which parents know where their adolescents are at night, how they spend their free time, who their friends are etc.,

Statements were summed up into a total score. Positive statements were reversed coded so that a good parent and adolescent relationship was coded with higher numbers and a bad relationship with parents was coded with lower numbers. This variable was recoded into a dichotomous variable with 0 representing a poor relationship and 1 representing a good relationship with parents, i.e., the threshold is 2.7, adolescents who fall below 2.7 signify a bad relationship with their parents and vice versa. Categorical variables are variables that categorize an observation simply. Binary variables are categorical and only take two values: Yes and No (Huntington, 2022).

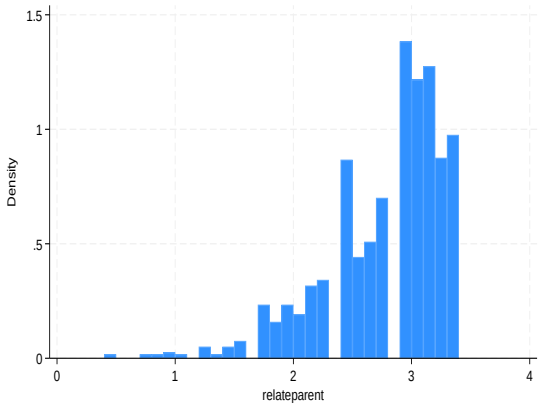

Figure 2. Histogram – a picture of parent-child relationships

The histogram shows the distribution for all the adolescents who have responded to the Ungdata survey. The histogram demonstrates that the variable is not normally distributed but is negatively skewed with a 'tail' of low observations stretching the mean below the median, they are called outliers (Dietz and Kaluf 2009, pp. 91-95). The histogram shows that most of the youth have responded with high values, such as 2 and 3, which suggests most of the youths have a good relationship with their parents.

4.3.2 Independent variables

Substance Use

Drug Use

My interest in drug use variable is to examine the effects of any exposure to cannabis or other narcotics on variables like mental health and family dynamics, regardless of the frequency of use.

Adolescents reported on the use of alcohol and drug use using the Ungdata survey which measured how frequently adolescents consume alcohol or drugs. Alcohol and drug use are two separate variables. For drug use like Hashish or marijuana, heroin, etc., participants were asked how frequently they take drugs. Never, 1 time, 2-5 times, 6-10 times, and 11 times or more, which was dichotomized to Never which gets the numerical value as 1 versus (1 time, 2-5 times, 6-10 times, and 11 times or more) which receives the numerical value as 0 to Indicate the extent to which they use/took drugs.

Alcohol Use

For alcohol use, participants were asked how frequently they drank alcohol. Never, have only tasted a few times, occasionally (not as often as monthly), Evenly 1-3 times a month, and Every week. This variable was recoded, and participants who answered Never and had only tasted a few times were given the numerical value "0" while the rest were given the numerical value of 1

Gender

Gender is undoubtedly a variable at the nominal level and for me to use it in these analyses I must recode it to a dummy variable. It is recoded as a dummy variable Boys have been given the variable "0" While Girls have the value "1".

Family Finances

Family finances include a question about "how well their family has been in the past two years". The variable is a five-point scale ranging from 1 to 5. The variable was coded so that those who answered, "We have been well off the whole time", "We have mostly had good financial situation/advice" or "We have neither been well off nor badly" are given the numerical value "1" on the variable family finances, which represents good family finances., while those who answered the rest of the questions are given the numerical value "0".

Grade Level

As alcohol and substance use seems to be more common among older students, it is chosen to control for grade level. Grade level is a continuous variable measured by the question "Which grade level do you attend?" and response options are Upper secondary 1, 2, and 3 school and grade level 8^{th}, 9^{th}, and 10^{th}.

Mental health

Adolescents answered questions on their mental health status which measured how unhappy they felt, if they felt hopeless about the future etc., with questions on a 4-point Likert scale ranging from 0 (very much bothered) to 3 (Not bothered at all) questions were flipped, for "Not bothered at all" which signifies good mental health can get the numerical value of "3". The

variable was then recoded into a categorical variable (good and bad mental health), good was given a numerical number of 1 and bad 0 for the statistical analyses, and the threshold for determining good and bad mental health was 1.85 using the mean. Participants above 1.8 signify good mental health and vice versa. However, it is important to note that due to data constraints and a low response rate from the respondents, depression is being used as a proxy for mental health. The impact this narrow scope will have on my findings is that it might not capture a broader spectrum or explanation of other mental health problems in parent-child relationships that might be influenced by substance use.

4.4 Reliability and Validity

Reliability and validity tests are very essential tools which researchers use to analyze the quality of a measurement. Reliability refers to the regularity of measurements. Standard reliability exhibits that similar results can be obtained several times, which means it is reproducible. Validity refers to the exact and accuracy of measurements. It examines whether a research instrument or method effectively measures what it claims to measure (Salomão 2023).

Parent-Child Relationship

This variable measures the relationship between parents and their adolescents. The questions comprised the quality of the relationships based on communication, monitoring, controlling, and support. For this study, 10 statements were chosen that best fit a good parent-and-adolescent relationship for instance, “My parents tend to know where I am and who I’m with in my spare time”, “my parents are very interested in my life”, “I enjoy being with them”, “I trust them”, “I try to keep most of my free time hidden from my parents” etc., with responses from, fits very well, fits quite well, fits very badly and fits very poorly. To evaluate the reliability of the parent-child relationship variable and internal consistency, the reliability analysis showed a Cronbach’s Alpha of 0.86 indicating a higher generally considered acceptable. For the validity test, a construct analysis was performed (factor analysis). The factor analysis suggests that most of the variables/statements related to parental relationships cluster into distinct factors, which indicates good construct validity. The high factor loadings for statements related to parent-child

relationships indicate that these statements measure coherent underlying constructs. However, the uniqueness shown in some statements suggests added measurements that will need further investigation.

Mental Health

This variable measured the mental status of adolescents, "they were asked if they felt everything is drudgery, had sleep problems, feeling unhappy, sad or depressed, feeling hopeless about the future, feeling stiff or tense, feeling lonely" etc., The responses range from Not bothered, little bothered, pretty much, and very much bothered. To evaluate the reliability of mental health variables and internal consistency, the reliability analysis yielded a Cronbach's Alpha of 0.89 indicating a higher generally considered acceptable. For the validity test, a construct analysis was performed (factor analysis). The results show that the uniqueness values for these statements were relatively low, which indicates that the factors explained a substantial portion of their variance. The likelihood ratio $p < 0.0001$ showed that the factor model.

Drug Use

This variable measured the frequency adolescents take drugs. Participants were asked, "How often do they take cannabis and other drugs". To evaluate the reliability of drug use variables an internal consistency was performed. The reliability analysis yielded Cronbach's Alpha at 0.73 indicating a higher generally considered acceptable. For the validity test, a construct analysis (factor analysis) was conducted on two items, the uniqueness values of these items were 0.5019 suggesting that the factor model analyses most of the variance of each item. The likelihood ratio test $p < 0.0001$ indicates that the factor model shows that the model fits significantly better than an independent model, confirming the validity of the constructs.

Alcohol Use

This variable measures how frequently adolescents drink alcohol. A reliability analysis was conducted on the alcohol use variable. However, alcohol use is a single-item measure, and reliability measures such as Cronbach's Alpha could not be applied. However, the consistency of responses was examined using descriptive statistics. The responses appear to be stable with a

clear majority indicating "Never" drinking alcohol. The distribution of responses showed a significant difference between the two categories, this indicates that respondents have different patterns of alcohol use. To evaluate the construct validity of the alcohol use variable, a correlation analysis was performed with theoretically related variables. Potential variables with mental health indicators (substance use, mental health, and parent-child relationship variables) were used in conducting the correlation analysis. The results indicate a positive correlation between alcohol use and other substance use. Also, alcohol use was negatively correlated with quality parent-child relationships and mental health. These correlations coordinate with theoretical expectations, supporting the construct validity of the alcohol measure.

Family Finances

This variable measures the family's financial situation. Respondents were asked about their family financial situations for the past two years, with responses from, we have been well off the whole time, we have mostly had a good financial situation, we have neither been well off nor badly, we have had mostly a poor financial situation, and we have been badly the whole time. The first three responses get a numerical value of 1, which means generally good finances and the rest get a numerical value of 0, which means bad finances. A reliability analysis was performed on the financial status variable. Since it is a single categorical variable, Cronbach's Alpha was not used. The consistency of responses was examined using descriptive statistics. The responses appear to be consistent across the sample, with the majority responding to 'Good' family financial finances. However, this can be seen as a skewed distribution. To evaluate the construct validity of the family finances variable, a correlation analysis was performed with theoretically related variables. Potential variables with mental health indicators (substance use, mental health, and parent-child relationship variables) were used in conducting the correlation analysis. The results showed a positive correlation between mental health and parent-child relationships, this indicates better family finances can also increase the quality of parent-child relationships and better mental health among adolescents. Conversely, there is a negative correlation between family finances and substance use, which means bad family finances can lead to an increase in substance use among adolescents. These correlations coordinate with theoretical expectations, supporting the construct validity of the alcohol measure.

This study has employed factor analysis and correlation tests to examine the construct validity and internal consistency of key variables. However, some limitations need to be noted. The family finances variable (famråd1) shows a highly skewed distribution, with most participants responding to good family finances. This may limit the reliability measure of detecting nuanced associations with other variables such as mental health or substance use.

The limited response for some mental health indicators may also affect the reliability of the measures. Also, the recoding of some of the variables into binary categories may have led to the loss of important information that can deter the validity of the constructs. Furthermore, it is important to address the self-reported data, which paves the way for social desirability bias, especially on topics like family finances and substance use. This could affect the validity of the results as some of the respondents can downplay their negative experiences. Further adjustment or refinement for some of these measures is essential for future research.

4.5 Statistical Analyses

All analyses in this report were conducted in the SPSS program. The statistical methods used to answer the problem are descriptive and multiple linear regression. First descriptive analyses of good relationships with parents (dependent variable) with gender, alcohol and drug use, socioeconomic status, mental health, and grade level (independent variables) are shown.

When it comes to identifying causal effects, regression is the most common way of approximating the relationship between two variables while controlling for others, allowing you to check for hidden factors with those controlled variables (Huntington, 2022). (Hellevik, 2009) argues that a linear analysis of dichotomous dependent variables is acceptable. This approach is considered acceptable, and in many situations preferred due to an interpretation that is easy to comprehend. In the multiple regression analyses, independent variables were added step by step in four different models.

A bivariate regression analysis of the independent variables was conducted to see how they individually affected the probability of having a good relationship with parents, based on the research questions a multiple linear regression analysis was performed. Model 1 checks for substance use and gender, to investigate whether it contributes to the variation of the dependent

variable. Model 2 checks for family finances and mental health, to investigate whether some of the association between substance use and relationship with parents is via the finances of the family and the mental health. In model 3, grade level was added as the control variable. In model 4, all variables were included, and an interaction term between family finances and substance with mental health. Finally, to answer some of the research questions mediation analysis had to be performed, the first mediation analysis investigated if mental health mediates between substance use and parent-child relationships, and the second analysis investigated if mental health mediates between family finances and parent-child relationships.

4.6 Data Analyses

4.6.1 Descriptive Analysis

Results

Table 1 Descriptive statistics: Distribution by Good relationship with parents by the independent variables in the analysis. Percent.

N= Number of respondents

	Good relationship with parents (>=2.7)	Poor relationship with parents (<=2.7)	Total	N
A good relationship with parents	N= 1628 (65%)	N= 850(34%)	100	2,478
Alcohol use				
Never	70.2	29.7	100	1,595
Regularly	42.5	57.4	100	883
Drug use				
Never	67.7	32.3	100	2,304
1 time or more	39.0	60.9	100	174
Gender				
Boy=0	69.3	30.6	100	1,200
Girl=1	63.2	36.7	100	1,231
Family Finances				
Bad finances=0	38.3	61.1	100	103
Good finances=1	66.8	33.1	100	2,375
Grade Level				
8th grade (=1)	71.6	28.3	100	483
9th grade (=2)	64.1	35.8	100	536
10th grade (=3)	60.9	39	100	517
Vg1 (=4)	63.4	36.4	100	405
Vg2 (=5)	68.1	31.8	100	336
Vg3 (=6)	68.1	31.8	100	201
Mental Health				
Bad mental health=0	46.9	53.1	100	991
Good mental health=1	78.7	21.2	100	1,419

4.6.1 Descriptive Analysis

Table 1 shows a cross-tabulated analysis of how the sample is distributed by a good relationship with parents by various independent variables. Adolescents who never engage in substance use are more likely to have a better relationship with their parents than adolescents who engage in substance use regularly. More boys have a better relationship with their parents than girls. However, the difference between boys and girls and their relationship with parents is not much.

Adolescents from families with good family finances are also more likely to have a better relationship with their parents, 67%, than adolescents from families with bad family finances 33%. The same can be said for mental health, adolescents with good mental health have a better relationship with parents 78% than adolescents with bad mental health 46%. Adolescents in 8th grade have a better relationship with their parents, as adolescents move upwards in grade level their relationship with their parents decreases, and it increases again for adolescents in upper secondary school 5 and 6.

In summary, substance use by adolescents affects their relationship with their parents. Boys show a slightly better relationship with their parents compared to girls. Younger students (8th grade) report better parent-adolescent relationships than older students. Adolescents with good mental health show significantly better relationships with their parents than those with poor mental health. Also, adolescents from families with good family finances report better relationships with their parents than those with bad family finances. There is a slim gap between adolescents with bad mental health, who have a good and bad relationship with their parents.

4.6.2 LINEAR REGRESSION ANALYSIS

Bivariate and multiple linear regression analysis with a good relationship with parents as the dependent variable.

Table 2: Regression Models Showing the Effect of Substance Use, Mental Health, and Family Finance on Parent-child Relationships

	Bivariate			**Model1**			**Model2**			**Model3**			**Model4**		
	B	SE	P	B	SE	P	B	SE	P	B	SE	P	B	SE	P
Drug_Use Yes (No=ref.)	-0.286	0.03	***	-0.237	0.04	***	-0.161	0.04	***	-0.162	0.04	***	-0.139	0.05	***
Alcohol_use1 Never (Regularly=ref.)	-0.128	0.019	***	-0.086	0.02	***	-0.059	0.02	***	-0.129	0.02	***	-0.118	0.03	**
Gender Girl (Boy=ref.)	-0.060	0.019		-0.062	0.02	**	0.012	0.02		0.016	0.02		0.017	0.02	
Family Finances good finances (bad finances=ref.)	0.280	0.047	***				0.133	0.02	***	0.134	0.02	***	0.125	0.03	***
Mental health bad (good mental health=ref.)	0.317	0.018	***				0.287	0.02	***	0.286	0.02	***	0.440	0.10	***
Grade level_continuous	-0.004	0.006								0.034	0.01	***	0.034	0.01	***
Interaction analysis															
alcohol_use * mentalhealth													-0.018	0.04	
drug_use * mentalhealth													-0.064	0.08	
familyfinances * mentalhealth													0.147	0.10	
constant				0.741	0.02	***	0.385	0.05	***	0.064	0.09		0.016	0.09	
R-squared				0.034			0.123			0.130			0.131		
Number of observations				2431			2365			2365			2365		

*****p<0.001, **p<0.01, *p<0.05 p-values indicate statistical significance.**

B = Coefficient. SE = Standard Error. Reference groups: Drug Use = No, Alcohol Use = Regularly, Gender = Boy, Family Finances = Bad, Mental Health = Good.

Interaction terms indicate whether the relationship between substance use and a good relationship with parents (parent-child relationships) varies with mental health.

Table 2 presents a bivariate and multiple regression analysis. The table shows a bivariate analysis i.e., a simple regression with a good relationship with parents as the dependent variable and another independent variable. Model 1 adds only the main effect, while models 2-4 steadily add control variables and interaction terms.

The bivariate analysis shows that being engaged in drug and alcohol use decreases the probability of having a good relationship with parents by (-0.286 and -0.128) respectively and it is significant. It is important to state the association between family finances and mental health, better mental health among adolescents increases the probability of a good relationship with parents by 0.317. Also, better family finances increase the likelihood of having a good relationship with parents by 0.280. Both variables are also significant. Girls have a lower probability of having a good relationship with parents than boys by -0.060, which is insignificant.

The multivariate model, model 1, includes gender as a control variable. The regression coefficient for drug use and alcohol use was reduced from the bivariate analysis to -0.237 and -0.086 respectively. Drug and alcohol use has a significant negative effect on the dependent variable even after controlling for gender. This may mean that gender takes over some of the explanation for the variation in the dependent variable.

Model 2 includes family finances and mental health in the analysis. The model shows that the effect of alcohol and drug use is adjusted downward when controlling mental health, family finances, and gender. The impact of mental health and family finances is also adjusted downwards when controlled for substance use and gender. This may indicate that the association between parent-child relationship and substance use is mediated by mental health and family finances, i.e., which means that adolescents who engage in substance use often experience bad mental health or are from families with bad finances. Model 2 explains 0.12 of

the variation of the dependent variable, which means that mental health and family finances also explain some of the variation in the dependent variable.

Model 3 includes grade level in the analysis. The model shows that alcohol and drug use is adjusted upward when controlling for grade level and other variables. In the bivariate model, grade level has no significant effect. However, in model 3 it becomes substantial, which means that higher grade levels may be associated with better outcomes.

As seen in Table 3, the interaction effect between substance use, family finances, and mental health is not statistically significant. Suggesting that substance use on a quality parent-child (good relationship with parent) does not vary with mental health status. However, it is important to note that mental health moderated for substance use decreases the probability of having a good relationship with parents. Family finances moderated for mental increases the probability of a good relationship with parents.

In summary, drug and alcohol use shows a negative effect on a good relationship with parents from Model I to Model 4. It is associated with poorer relationships with parents across all models. Good mental health and better family finances are positively associated with good parent-child relationships. The interaction terms between substance use, family finances, and mental health were not statistically significant, meaning the impact of substance use, family finances, and mental health is mostly additive rather than interactive.

4.6.3 Mediation analysis

Mediation analysis can be defined as a statistical approach that analyzes the causal effect of an independent variable X on a dependent variable Y by changing one or more mediator (Intervening) variables. (Tofighi, 2023). The direct causal relationship between the independent and the dependent variable can often be false, however, a mediation model shows that the independent variable affects the mediator variable, which affects the dependent variable.

Figure 3. A conceptual diagram of a simple mediation model

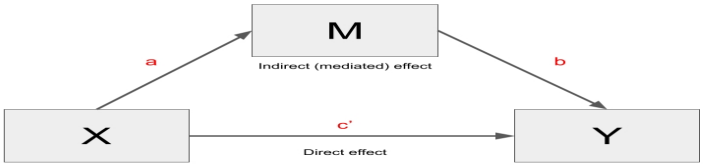

Table 3 A mediation analysis table: Explaining the mediating role of adolescent mental health between substance use and parent-child relationship (a good parent relationship)

Variable	Coefficient	Std. Error	P-value	95% Confidence interval
Direct Effect A good parent relationship	0.076		***	
Alcohol use (Never vs Regularly)	-0.091	.020	***	(-0.013 - -0.051)
Drug use (Never vs 1 time or more)	- 0.023	.038	***	(-0.031 - -0.016)
Mediator Effect (Mental Health)				
A good parent relationship	0.064		***	
Alcohol use	-0.011	.021	***	(-0.154 - -0.070)
Drug use	-0.021	.040	***	(-0.029 - -0.013)
Indirect Effect A good parent relationship	0.051		***	
Mental health	0.029	.019	***	(0.025 - 0.032)
Alcohol use	-0.060	.037		(-0.010 - -0.022)
Drug use	-0.017	.016	***	(-0.025 - -0.103)

p<0.10, **p<0.05,p<0.01, p value indicates statistical significance. Note: B = Unstandardized coefficient; SE = Standard Error; Reference groups: Alcohol use = Regularly,**

Drug Use = No. The direct effects are the impact of substance use on the parent relationship excluding the mediator, the mediator effect is the effect of mental health on the relationship, while the indirect effect is the combined effect of the mediator.

Figure 2 explains the importance of understanding a known relationship by analyzing the other factors by which one variable affects another variable through the mediator. This mediation analysis model is used to investigate the underlying variable, the mediator (mental health), that can be affected by the independent variable (substance use) and in return affect the dependent variable (relationship with parents).

As seen in Table 3, In line with question 1, which states does mental health mediate the relationship between substance use and parent-child relationship? The direct effect shows the positive and significant coefficient of having a good relationship with parents, this indicates the moderate positive association between the parent relationship and the outcome variable. Adolescents who never use alcohol are more likely to have a better relationship with their parents compared to those who drink regularly. Adolescents who drink regularly show a negative coefficient, this indicates the strong relationship between regular use of alcohol and how it affects the parent-child relationship. The relationship between Adolescents who use the drug and their relationship with their parents is weaker compared to those who regularly take alcohol. However, drug use still shows a statistically significant negative effect on the parent-child relationship.

The Mediator effects show that good/better mental health is positively associated with a better parent-child bond. This indicates that mental health positively mediates the relationship with parents i.e., good mental health is moderately associated with a good parent-child relationship. The little negative coefficient of alcohol use indicates that mental health slightly mediates the effects of alcohol use, this suggests that regular use of alcohol negatively affects the parent-child bond through its impact on mental health. Similarly mental mediates the relationship between drug use and the parent-child relationships with a moderate negative relationship

association, this shows adolescents who engage in drug use negatively affect their mental health, which in turn affects the relationship they have with their parents.

Indirect effects, mental health is the mediator in the indirect effect, which has a positive impact on the parent-child relationship, with a moderate positive effect. As seen in Table 3, mental health shows a small but significant effect in the indirect effect. This suggests a slight positive effect on the parent-child bond through better mental health. Alcohol use on the parent-child bond is moderate, negative, and not statistically significant. Drug use shows a negative coefficient; however, it is still statistically significant on the parent-child bond through mental health.

In summary, the findings show that alcohol and drug use negatively harm parent-adolescent relationships. Mental health mediates this relationship, which means the effect of substance use on parent-child relationships happens through the effect of substance use on mental health. This indicates that improved mental health could help reduce the harmful effects of substance use in the parent-child relationship. This signifies the importance of mental health in explaining the association between substance use and parent-child relationships which answers my research question. This model focuses on the gravity of mental health between substance use and parent-child relationships, proposing that intervention that focuses on mental health can deter some of the harmful consequences of substance use on family relationships.

Table 4 A mediation analysis table: Explaining the mediating role of adolescents' mental health between family finances and parent-child relationships.

Variable	Coefficient	Std. Err	P-value	95% Confidence interval
Direct Effect A good relationship with parents	0.388		***	
Family Finances	0.280	.047	***	(0.18 – 0.37)
Mediator Effect (Mental Health)				
A good relationship with parents	0.803		***	
Family Finances	-0.116	.010	***	(-.138 - -.095)
Indirect Effect A good relationship with parents	0.303		***	
Mental Health	0.307	.018	***	(.270 - .344)
Family finances	0.178	.045	***	(.089 - .268)

***p<0.10, **p<0.05 , ***p<0.01 , p value indicates statistical significance**

Note: B = Unstandardized coefficient; SE = Standard Error; Reference groups: Family finance = Good family finance. The direct effects are the impact of family finance on the parent relationship excluding the mediator, the mediator effect is the effect of mental health on the relationship, while the indirect effect is the combined effect of the mediator.

Table 4 shows the mediation analysis that analyses how mental health mediates the relationship between family finances and parent-adolescent relationships in line with research question 2 i.e. how does mental health mediate the link between family finances and parent-child relationships among adolescents in Norway?

The direct effect shows a positive coefficient which means there is a strong association between having a good relationship with parents and family finances. This indicates the relevance of socio-economic status to the parent-child bond. Family finance shows a positive coefficient which suggests a strong relationship between those who come from families with generally good family finance. Adolescents from families with bad financial situations are less likely to have a good relationship with their parents.

The mediator effect, mental health positively mediates the relationship with parents, which suggests that good mental health is strongly associated with a better parent-child relationship. Family finances show a negative and moderate coefficient. This suggests mental health mediates the impact of family finances i.e., bad family finances can worsen the parent-child relationship through its effects on mental health.

Mental health serves as a mediator in the indirect effect, with a positive impact on the parent-child relationship. This shows a strong positive impact, suggesting that good mental health among adolescents leads to a better parent-child relationship.
The indirect effect on mental health is high and significant. Indicating a positive impact on parent-child relationships. The indirect effect of family finances on the parent-child relationship is moderate and statistically significant through the mediator of mental health.

In summary, better family finances directly help with quality parent-adolescent relationships which means that good finances can lead to a better relationship between parent and adolescent. Mental health mediates the relationship between family finances and the parent-adolescent relationship which answers research question 2 in this study. Bad family finances are associated with bad mental health which can negatively influence parent-adolescent relationships. Family finances play a role in indirectly enhancing parent-adolescent relationships by boosting the mental health of adolescents. Mental health also plays a major role and is an important factor in mediating relationships. Emphasizing its role as an important factor in financial stability and a quality parent-adolescent relationship.

5 Discussion

This thesis examines the mediating role of adolescent mental health and the link between substance use and parent-adolescent relationships in Norway, and whether there is a significant relationship between substance use and a quality relationship with their parents. Despite substantial research on substance use, mental health, and parent-child relationships, few studies have directly explored the mediating role of mental health in the link/relationship between substance use and parent-child relationships. This study aims to fill that gap.

The main finding is that adolescents' mental health mediates the relationship between substance use and the quality of the parent-child relationship, which rejects my first hypothesis. Furthermore, I hypothesized that adolescent mental health would not mediate the link between substance use and parent-adolescent relationships. Substance use has harmful effects on the mental health of adolescents which in turn affects their relationship with their parents. These results give reasons to assume that adolescents who engage in substance use can lead to poor mental health which can also cause a poor parent-child relationship. However, there are limited studies on the mediating effect of adolescent mental health between substance use and parent-and-child relationships. Some findings correspond with those of a growing body of literature that conceptualizes involvement with alcohol and drug use and its harmful effect on adolescents' mental health. According to Johannessen et al, 2017, adolescents experience high levels of depression symptoms associated with drinking alcohol at an early age, consistent consumption, and intoxication (Johannessen et al, 2017). Adolescents who engage in substance use are more likely to experience mental health issues compared to those who don't use them. Also, Kaasbøll et al, 2018, adolescents who engage in drug use are more likely to experience mental health symptoms compared to non-drug users (Kaasbøll et al, 2018).

Previous studies have also shown that adolescents who experience mental health issues are less likely to experience a better/quality parent-child relationship. Branje et al 2010, investigated the longitudinal associations between perceived parent-child relationship quality and depressive symptoms in adolescence, adolescents who experience depressive symptoms experience a weak quality relationship with their parents (Branje et al, 2010). The research

indicates that bad mental health deters parent and adolescent relationships. However, this current study is based on a year (2021), and the strength of the mediation effect of mental health between substance use is the parent-child relationship is analyzed compared to previous research. Future research should focus on more diverse samples and longitudinal data to better understand how mental health mediates the relationship between substance use and family bonds over time.

Using theoretical frameworks, the attachment theory explains the importance of a secure attachment between parents and adolescents, especially adolescents. Adolescents with secure attachments with their caregivers can positively impact their well-being. Promoting parent-child relationships is important in preventing adolescents' health risk behaviors. This aligns with previous studies, Raja et al 1992., analyzed the importance of attachments to both parents and peers on the psychological well-being of adolescents, adolescents who perceived high attachments to both parents and parents had the highest scores on a measure of self-perceived strengths (Raja et al, 1992). Also, in a study by Wilkinson 2004, on "the role of parental and peer attachment in the psychological health and self-esteem of adolescents between Australian and Norwegian adolescents (12-19) years", the results show the role of peer and parental attachment on adolescents psychological health is mediated by self-esteem (Wilkinson, 2004). Other studies include other aspects of mental health, including the impact of peers on the lives of adolescents. This study did not include such factors due to low responses from adolescents. Mental health remains statistically significant even when controlled for other variables and is still mediated between substance use and the parent-child relationship.

The second hypothesis states, that there will be a significant relationship between substance use and the parent-child relationship, which confirms my hypothesis. Furthermore, I hypothesized that adolescents who do not engage in substance use are more likely to have a better relationship with their parents, which predicts that adolescents who engage in substance use are less likely to have a better parent-child relationship. Studies that have analyzed the direct effect of adolescent substance use on parent-child relationships are limited in Norway, there are still previous studies that have explained the impact of teenage substance use on family bonds. Dykes and Casker 2021, "The effect of adolescent substance abuse on parents

and siblings". It describes the devastating impact on the family's financial position, physical health, and psychological well-being. Family members, especially siblings take the role to succor their siblings from damaging their lives (Dykes & Casker, 2021). Newcomb & Bentler 1998, the use of substances by adolescents causes health and family problems. Abo Hamza et al 2021, found that families who have substance-addicted teenagers have a lower family quality of life, lower marital satisfaction, and experience depression, anxiety, and stress. The current study is also in line with previous studies, that adolescents who use substance use harm the parent-child relationships. However, this study does not address the psychological well-being or the mental health of the family/parents dealing with adolescents who engage in substances, but rather on the mental well-being of adolescents. Future research should aim to replicate these findings focusing on the impact of adolescent substance use on the mental well-being of parents/family.

Finally, the last hypothesis is that there will be no significant relationship between family finances and parent-child relationships. However, there is a significant relationship between family finances and the parent-child relationship, which rejects my last hypothesis. Adolescents from families with bad finances are likely to have relationships with their parents. The results agree with prior work on family wealth and parent-child relationships. For example, Ramdahl et al 2018, found that increasing family wealth was linked with easier family communication, clearer family communication, and higher family support. Also, perceived parenting styles among Norwegian adolescents by Elstad and Stefansen (2014) focus on four parenting styles (Responsiveness, demandingness, neglecting, and intrusive) and found that adolescents in families with fewer economic resources experienced their parents as less responsive, and low parental education was linked to perceptions of parents as neglecting and intrusive.

5.1 Limitations and strengths of the study

Ungdata has several strengths, it is population-based with a large sample. The questionnaire consists of copious questions, which enables the examination of a variety of relationships while also controlling for confounders. However, the data made for pupils, have fewer variables,

meaning that some variables that would be potential confounders are not included. Pupils from secondary schools throughout Norway partook, which makes the results representative of the Norwegian secondary school population. The study has its limitations. Ungdata is a cross-sectional study, and no conclusion can be drawn about causal relationships, especially causal conclusions about the direction of relationships among substance use, mental health, and parent-child dynamics. The longitudinal method would be an essential method to elucidate these associations over time. It is important to be aware that all Ungdata results are based on self-reported data. It is not entirely clear whether the adolescents understand the questions in the same way as the researcher and if they respond to the questions truthfully. This would imply reduced validity.

Mental health is a term used to describe the overall well-being of an individual. It is a complex, multidimensional construct. Data limitations repressed this study to use only depression as an index. This curtailment may reduce the mental health dynamics affecting parent-child relationships since other mental health issues are not captured such as anxiety or behavioral disorders. It is important to note that the findings should be interpreted with attentiveness since depression may not fully represent adolescent mental health in this context, especially in the year 2021.

This study included a lot of variables to be controlled for, such as family finances, gender, grade level, etc., but other factors can also shed light on the relationships between adolescents' mental health, substance use, and parent-child relationships. Other factors like peer influence, academic performance, or social support networks. Regarding family finances, previous studies included the importance of the parental level of education and parental employment status. All these can be factors that can also explain adolescent mental health, substance use, and family dynamics. It could play a significant role in this relationship for future research.

6 Summary and Implications

In summary, the current study focused on the mediating role of adolescents' mental health between substance use and parent-child relationships in Norway. The results show that mental

health is mediated between substance use and parent-child relationships and, adolescents' mental health mediates the relationship between family finances and parent-child relationships. Adolescents from low socio-economic status are more likely to experience mental health issues which will in turn affect the relationship they have with their parents. However, Bowlby's attachment theory doesn't state the impact of family finances on the psychological well-being of the child, but rather on the importance of the parent-child bond on the overall well-being of a child which can, in turn, avoid risky behaviors. The findings of the study support that the parent-child relationship/bond is an essential experience that will contribute to the proper and healthy development of adolescents.

The exosystem in the ecological system theory i.e., there are the formal and informal structures that don't directly influence the child but also affect the interaction between parent and child like the parental employment, family financial situations, etc., The findings of this study show that adolescents from families with low socio-economic status are more likely to have a worse relationship with their affects their mental health and in turn, lead to risky behaviors. The microsystem, which consists of parents, peers, neighbors, etc., has a direct impact on the life of a child. A bad relationship with parents can affect the mental, social, and emotional well-being of a child. The findings of this study support that adolescents can be directly and indirectly influenced by the interconnected systems of society. However, future studies in Norway should include other bases for assessing parents' finances like employment status, educational status, etc., to draw a firm and general conclusion on the effect of family finances on the well-being of adolescents. Also, different parenting styles and the effects it has on adolescents should be studied and included as variables in the Ungdata questionnaire.

This suggests that interventions targeting adolescent mental health could reduce the negative effect of substance use on family bonds. While this research provides useful information, limitations such as constrained data and reliance on self-reported data suggest the need for future studies that can integrate longitudinal data and incorporate other variables/factors that should be directed to adolescents, like questions about divorce. This thesis adds to the growing body of literature on adolescent substance use, mental health, and family dynamics.

References.

Abo Hamza, E.G., Gladding, S., & Moustafa, A.A. (2021). *The impact of Adolescent substance Abuse on Family Quality of Life, Marital Satisfaction, and Mental Health in Qatar. The Family Journal.* https://doi.org/10.1177/10664807211000720

Agerup, T., Lydersen, S., Willander, J., & Sund, A.M. (2014). *Associations Between Parental Attachment and Course of Depression Between Adolescence and Young Adulthood. Child Psychiatry & Human Development.* https://doi.org/10.1007/s10578-014-0506-y

Andriy. (2024*). Bowen's Family Systems Theory. Dynamics of Relationships. A Simplified Psychology Guide*. https://psychology.tips/bowen-s-family-systems-theory/

Arnarsson. M. A., Potrebny. T., Torsheim. T., & Eriksson. C. (2019). *Time-trends in Nordic adolescents with their parents. Nordic Welfare Research.* https://doi.org/10.18261/issn.2464-4161-2019-02-06

Askeland, K.G., Radlick, R.L et al. (2004). *Parental Unemployment and educational outcomes in late adolescence: The importance of family cohesion, Parental education, and Family Income in a Norwegian study. Scandinavian Journal of Public Health.* https://doi.org/10.1177/14034948241228163

Bahr, S.J., Hoffman, J.P., & Yang, X. (2005). *Parental and peer influence on the risk of adolescent Drug use. Journal of Primary Prevention.* https://doi.org/10.1007/s10935-005-0014-8

Bakken, A. (2018). Ung i Oslo 2018. *Nova: Oslo*.

Bendixsen, S., Bringslid, M.B., & Vike, H. (2018). *Introduction: Egalitarianism in a Scandinavian context. Approaches to social inequality and Difference. Palgrave Macmillan.* https://doi.org/10.1007/978-3-319-59791-1_1

Bi. X., Yang. Y., Li. H., Wang. M., Wexin. Z., & Deckerd. K.D. (2018) *Parenting Styles and Parent-Adolescent Relationships. The Mediating Roles of Behavioral Autonomy and Parental Authority* https://doi.org.10.3389/fpsyg.2018.02187

Bradley, H.R. & Corwyn, R.F. (2002). *Socioeconomic Status and Child Development. Annual Review of Psychology.* https://doi.org/10.1146/annurev.psych.53.100901.135233

Branje, S.J., Hale, W.W., & Meeus, W.H. (2008). *Reciprocal development of parent-adolescent support and adolescent problem behaviors.* https://doi.org/10.1002/9780470774113.ch6

Branje, S.J.T., Hale, W.W., Frijns, T. *et al.* (2010). *Longitudinal Associations Between Perceived Parent-Child Relationship Quality and Depressive Symptoms in Adolescence. Journal Abnormal Child Psychology.* https://doi.org/10.1007/s10802-010-9401-6

Branstetter, SA., Furman, W., & Cottrell, L. (2009). *The Influence of the Representation of Attachment Maternal- Adolescent Relationship Quality and Maternal Monitoring on Adolescent substance use: A two-year longitudinal examination. Child development.* *https://doi.org/10.1111/j.1467-8624.2009.01344.x*

Bronfenbrenner, Urie. (2005). *Making human beings human: Bioecological perspectives on human development. Sage.*

Buddy, T. (2023). *An overview of substance use. VerywellMind.* https://www.verywellmind.com/substance-use-4014640

Bush, K.R., Peterson, G.W. (2013). *Parent-Child Relationships in Diverse Contexts*. In: *Peterson, G., Bush, K. (eds) Handbook of Marriage and the Family*. Springer, Boston, MA. https://doi.org/10.1007/978-1-4614-3987-5_13

Bøe, T., Dearing, E., Stormark, K.J., & Zachrisson, D.H. (2017). *Subjective Economic status in Adolescence: Determinants and Associations with Mental Health in the Norwegian Youth@Hordaland Study. Journal of Family and Economic Issues.* https://doi.org/10.1007/s10834-017-9553-4

Bøe, T. (2013). *Socioeconomic status and Mental Health in children and adolescents. Bergen Open Research Archive.* https://hdl.handle.net/1956/7697

Bøe, T., Petrie, K.J., Sivertsen, B., & Mari Hysing. (2019). *The interplay of subjective and objective economic well-being on the mental health of Norwegian adolescents. Population Health.* https://doi.org/10.1016/j.ssmph.2019.100471

Capaldi, C. A., Varin, M., & Dopko, R. L. (2021). *Determinants of psychological and social well-being among youth in Canada: investigating associations with sociodemographic factors, psychosocial context, and substance use*. Health promotion and chronic disease prevention in Canada: research, policy and practice. https://doi.org/10.24095/hpcdp.41.2.02

Carver, H., Elliott, L., Kennedy, C., & Hanley, J. (2017). *Parent-child connectedness and communication about alcohol, tobacco and drug use in adolescence: An integrative review of*

the literature. Education, Prevention, and Policy. https://doi.org/10.1080/09687637.2016.1221060

Chen, P., & Harris KM. (2019*). Association of Positive Family Relationships with Mental Health Trajectories from Adolescence to Midlife. JAMA Pediatrician*. https://doi.org/10.1001/jamapediatrics.2019.3336

Cherry, K. (2023). *A comprehensive guide to the Bronnfenbrenner Ecological Model. Verywell Mind.* https://www.verywellmind.com/bronfenbrenner-ecological-model-7643403

Clausen, Stein-erik. (1996). *Parenting Styles and Adolescents Drug Use Behaviors. Behaviors childhood.* https://doi.org/10.1177/0907568296003003006

Compton, M.T. (2016). *Marijuana and Mental Health. First edition. American Psychiatric Association publishing.*

Daniel, J.Z., Hickman, M., Macleod, J., Wiles, N., Lingford-Hughes, A., Farrell, M., Araya, R., Skapinkas, P., Haynes, J., & Lewis, G. (2019). *Is socioeconomic status in early life associated with drug use? A Systematic review of the evidence. Drug and Alcohol review.* https://doi.org/10.1111/j.1465-3362.2008.00042.x

Das, J.K et al. (2016). *Intervention For Adolescents Substance Abuse: An overview Of Systematic reviews. National Library of Medicine.* https://doi.org/10.1016/j.jadohealth.2016.06.021

Dietz, T. & Kalof, L. (2009). *Introduction to social statistics. The Logic of Statistical Reasoning.* United Kingdom. Wiley Blackwell

Dykes, G., & Casker, R. (2021). *Adolescents and substance abuse: The effects of substance abuse on parents and siblings.* International Journal of Adolescence and Youth. https://doi.org/10.1080/02673843.2021.1908376

Elstad, J. I., & Bakken, A. (2015). *The effects of parental income on Norwegian adolescents' school grades: A sibling analysis*. https://doi.org/10.1177/0001699315594411

Elstad, J. & Stefan, K. (2014). *Social Variations in Perceived Parenting Styles among Norwegian Adolescents. Child Ind Res*, 649-670.

https://doi-org.ezproxy.oslomet.no/10.1007/s12187-014-9239-5

Ennett, S.T., Baumann, K. E., Foshee, V. A., Pemberton, M., & Hicks, K. A., (2001). *Parent-child Communication about Adolescent Tobacco and Alcohol Use: What Do Parents Say, and Does it Affect Youth Behavior? Journal of Marriage and Family.* https://www.jstor.org/stable/3599958

Felman, A & Tee-Melgrito, R. A. (2024, March 22). *What is mental health?* https://www.medicalnewstoday.com/articles/154543

Filus, A., Schwarz, Mylonas, B., Sam, D. L., & Boski, P. (2019). *Parenting and Late Adolescents 'Well-Being in Greece, Norway, Poland, and Switzerland: Associations with Individuation from Parents. Journal of Child and Family Studies*. https://doi.org/10.1007/s10826-018-1283-1

Gopalkrishnan, N. (2018) *Cultural Diversity and Mental Health: Considerations for Policy and Practice. Frontiers in public health.* https://doi.org/10.3389/fpubh.2018.00179

Granite Recovery Centers. (2023*). Patterns of Substance Use.* Patterns Of Substance Use | Granite Recovery Centers

Gupta, S. (2022, October 1). *Substance Use vs. Substance Abuse: What Are the Differences?* Verywell Mind. https://www.verywellmind.com/substance-use-vs-substance-use-disorder-whats-the-difference-6385961

Guy-Evans, O. (2024). *Bronfenbrenner's Ecological Systems Theory. Simply Psychology.*

https://www.simplypsychology.org/bronfenbrenner.html

Haavik, L., Joa, I., Hattloy, Stain, H., Langeveld, J. (2019). *Help-seeking for mental health problems in an Adolescent population: the effect of gender. Journal of Mental Health.* https://doi.org/10.1080/09638237.2017.1340630

Heradstveit. O., Nilsen, S. A., Breivik. K., Bakken. A., Hartveit. K., & Stomark. K. J. (2021). *Past Year Cannabis Use Among Norwegian Adolescents: Time Trends Based on the Ungdata Surveys 2010-2019.* Front. Psychiatry. https://doi.org/10.3389/fpsyt.2021.627479

Hanson, M.D. (2007). *Socioeconomic status and substance use behaviors in adolescents: The role of family resources versus family social status. Journal of Health Psychology.* https://doi.org/10.1177/1359105306069073

Hellevik, O. (2009). *Linear Logistic Regression When the Dependent Variable Is a Dichotomy. Quality and Quantity.*

Huntington-Klein, N. (2021). *The Effect: An Introduction to Research Design and Causality.* Florida, USA: CRC Press.

Hurley, E., Dietrich, T., & Sharyn, R. T. (2019). *A systematic review of parent-based programs to Prevent or reduce alcohol consumption in adolescents.* 10.1186/s12889-019-7733-x

Jacobsen, S. (2020). *Association between mental health, subjective income status, perceived parental and peer support, and substance use in Icelandic college students.*

Jane Coy., M. (2019). *Adolescent Substance Abuse: An introduction to Attachment and Systems Theories. Social Science and Humanities Journal.* https://sshj.in/index.php/sshj

Johannessen, E.L., Andersson, H.W., Bjørngaard, J.H. & Pape, K. (2017). *Anxiety and depression symptoms and alcohol use among adolescents - a cross-sectional study of Norwegian secondary school students. BMC Public Health* https://doi.org/10.1186/s12889-017-4389-2

Jørgenrud, B., Furuhaugen, H., & Gjerde, H. (2021*). Prevalence and Correlates of Illicit Drug Use among Norwegian Nightlife Patrons, Substance Use & Misuse.* https://doi.org/10.1080/10826084.2021.1949613

Kaasbøll, C., Hagen, R., Gråwe, W.R. (2018). *Population-based association among cannabis use, Anxiety, and Depression in Norwegian Adolescents. Journal of Child & Adolescent Substance Abuse.* https://doi.org/10.1080/1067828X.2018.1462281

Karbowa-Polwens, M. (2021). *John Bowlby and Attachment Theory Encyclopaedia of Evolutionary Psychological Science. https://doi.org/10.1007/978-3-319-19650-3_3574*

Karlsen, B. S., Clench-Aas, J., Van Roy, B., & Raanaas, R. K. (2014). *Relationships between social anxiety and mental health problems in early adolescents from different socioeconomic groups: results from a cross-sectional health survey in Norway*. http://dx.doi.org/10.4172/2329-9525.1000120

Kreppner, K., & Ullrich, M. (1997). *The Quality of Parent-Parent Communication in the Family and its Impact on Adolescent Development. Max Planck Institute for Human Development and Education.*

Kocayörük, E., Altıntas, E. & İçbay, M.A. (2015). *The Perceived Parental Support, Autonomous-Self and Well-Being of Adolescents: A Cluster-Analysis Approach*. Journal Of Child and Family studies. https://doi.org/10.1007/s10826-014-9985-5

Lee, J.B., & Yoo, M.S. (2015). *Family, school, and community correlates of children's subjective well-being: An International comparative study—child indicators Research.* https://doi.org/10.1007/s12187-014-9285-z

Luk. J. W., Farhat. T., Lannotti. R.J., & Simons. B. G. (2009). *Parent-Child Communication and Substance Use among Adolescents: Do Father and Mother communication play a different role for sons and daughters?* https://doi.org/10.1016/j.addbeh.2009.12.009

Mayberry, M.L., Espelage, D.L. & Koenig, B. (2009). *Multilevel Modeling of Direct Effects and Interactions of Peers, Parents, School, and Community Influences on Adolescent Substance* Use. *J Youth Adolescence*. https://doi.org/10.1007/s10964-009-9425-9

Mason, M., Mennis, J., Light, J., R, J., et al, (2016). *Parents, Peers, and Places: Young Urban Adolescents' Microsystems and Substance Use Involvement. Journal of Child and Family Studies.* https://doi.org/10.1007/s10826-015-0344-y

McLaughlin, A., Campbell, A., & McColgan, M. (2016). *Adolescent Substance Use in the Context of the Family: A Qualitative Study of Young People's Views on Parent-child Attachments, Parenting Style and Parental Substance Use. Substance use & misuse.* https://doi.org/10.1080/10826084.2016.1197941

Mcleod, S. (2024). *John Bowlby's attachment. Child psychology.* https://www.simplypsychology.org/bowlby.html

Miller. C., & Taskiran, S. MD. (2023, October 30). *Mental health disorders and teen substance use*. Child Mind Institute https://childmind.org/article/mental-health-disorders-and-substance-use/

Mills, R. M. (2021). *Parental Support and Monitoring as Associated with Adolescent Alcohol and Tobacco Use by Gender and Age. BMC Public Health*.

https://doi.org/10.1186/s12889-021-12119-3

Myhr, A., Anthun, K.S., Lillefjell, M., & Sund, E.R. (2020). *Trends in Socioeconomic Inequalities in Norwegian Adolescents' Mental Health from 2014 to 2018: A repeated cross-sectional study. Front Psychology.* https://doi.org/10.3389/fpsyg.2020.01472

Newcomb, M.D., & Bentler, P.M. (1988*). Impact of adolescent drug use and social support on problems of young adults: A longitudinal study. Journal of Abnormal Psychology.* https://doi.org/10.1037/0021-843X.97.1.64

NOVA. (2022). Ungdata 2010-2021 [Datasett]. Sikt - Kunnskapssektorens tjenesteleverandør. https://doi.org/10.18712/NSD-NSD3007-V4

Nyhus, E. K., & Webley, P. (2013). *The relationship between parenting and economic orientation and the behavior of Norwegian adolescents. The Journal of Genetic Psychology.* https://doi.org/10.1080/00221325.2012.754398

Øyfrid, L. & Hall-Lord, M.L. (2018). *Adolescents' Mental Health, help-seeking, service use, and parents' perception of family functioning. Nordic Journal of Nursing Research, 1-8.* https://doi.org/10.1177/2057158518764036

Povey, J., Plage, S., Huang, Y., Gramotnev, A., Cook, S., Austerberry, S., & Western, M. (2022) *Adolescence a period of vulnerability and risk for adverse outcomes across the life course: The Role of parent-engagement in learning. Family dynamics over the life course. Life Course Research and Social Policies. https://doi.org/10.1007/978-3-031-12224-8_6*

Raja, N.S., Mcgee, R., & Stanton, W.R. (1992). *Perceived attachments to parents and peers and psychological well-being in adolescence. Journal of Youth and Adolescence.* https://doi.org/10.1007/BF01537898

Ramdahl, M.E., Jensen, S.S., Borgund, E. et al. (2018) *Family Wealth and parent-child relationships. Journal of Child Family Studies.* https://doi.org/10.1007/s10826-017-1003-2

Reiss, F. (2013). *Socioeconomic inequalities and mental health problems in children and adolescents: A systematic review. Social Science and Medicine.* https://doi.org/10.1016/j.socscimed.2013.04.026

Reiss, F., Meyrose, A.K., Otto, C., Lampert, T., Flonna, K., & Ulrike, R.S. (2019). *Socioeconomic status, stressful life situations, and mental health problems in children and adolescents.* Results of the German BELLA cohort study. https://doi.org/10.1371/journal.pone.0213700

Richert, T., Anderberg, M. & Dahlberg, M. (2020). *Mental health problems among young people in substance abuse treatment in Sweden. Substance Abuse Treatment, Prevention and Policy.* https://doi.org/10.1186/s13011-020-00282-6

Robert, H.B & Robert, F.C. (2002). *Socioeconomic status and Child Development. Annual Review of Psychology.* https://doi.org/10.1146/annurev.psych.53.100901.135233

Røe-Indregård, H., Rowe, M. L., Rydland, V., & Zambrana, I. M. (2022). Features of communication in Norwegian parent-child play interactions. *First Language*. https://doi.org/10.1177/01427237211072661

Rusby, J. C., Light, J. M., Crowley, R., & Westling, E. (2018*). Influence of parent-youth relationship, parental monitoring, and parent substance use on adolescent substance use onset.* Journal of Family Psychology: JFP: journal of the Division of Family Psychology of the American Psychological Association https://doi.org/10.1037/fam0000350

Salomão, A. (2023, July 27). *Reliability vs Validity in Research: Measuring What Matters. Mind the Graph Blog*. https://mindthegraph.com/blog/reliability-vs-validity-in-research/

Sherwood High (2023, March 20). *The role of communication in building strong Parent-Child Relationships.* https://sherwoodhigh.com/blogs/the-role-of-communication-in-building-strong-parent-child-relationships/#:~:text=It%20involves%20creating%20an%20environment,bond%20between%20parent%20and%20child

Skogen, J.C., Sivertsen, B., Lundervold, A. S., Stormark, K.J., Jakobsen, R., & Hysing, M. (2014). *Alcohol And drug use among adolescents: and the co-occurrence of mental health problems.* Ungahordaland, a population-based study. BMJ. http://dx.doi.org/10.1136/bmjopen-2014-005357

Sommer, M. (2016). *Mental Health among Youth in Norway. Nordic Center for Welfare and Social Issues.*

Substance use and Co-Occurring mental disorders. (n.d.). National Institute of Mental Health (NIMH). https://www.nimh.nih.gov/health/topics/substance-use-and-mental-health

Tharaldsen, K.B., Stallard, P., Cuijpers, P., Bru, E., & Bjaastad, J.F. (2017). *'It's a bit taboo': a qualitative study of Norwegian adolescents' perceptions of mental healthcare services.* Emotional and Behavioural Difficulties*, 22*, 111 - 126. https://doi.org/10.1080/13632752.2016.1248692

Tofighi, D. (2023). *Mediation Analysis. Encyclopedia of Quality of Life and Well-Being Research.* https://doi.org/10.1007/978-3-031-17299-1_1771

Tornay, L., Michaud, PA., Gmel, G., Wilson, ML., Berchtold, A., & Suris, JC. (2013*) Parenting monitoring: a way to decrease substance use among Swiss adolescents. European Journal of Pediatrics.* https://doi.org/10.1007/s00431-013-2029-0

Velleman, R. DB et al. (2005). *The Role of the Family in preventing and intervening with substance use and misuse: a comprehensive review of family interventions, with a focus on young people. Drug and Alcohol review.* https://doi.org/10.1080/09595230500167478

Wikipedia contributors. (2024, February 29). *Ecological systems theory. In Wikipedia, The Free Encyclopedia.* Retrieved 15:05, March 30, 2024. from https://en.wikipedia.org/w/index.php?title=Ecological_systems_theory&oldid=1211038553

Wilkinson, R.B. (2004). *The Role of parental and peer Attachment in Adolescents' Psychological Health and self-esteem. Journal of Youth and Adolescence.* https://doi.org/10.1023/B:JOYO.0000048063.59425.20

Williams, A. (2003). *Adolescents' relationships with parents*. Journal of Language and Social Psychology. https://doi.org/10.1177/0261927x02250056

World Health Organization: WHO. (2022, June 17). *Mental health*. https://www.who.int/news-room/fact-sheets/detail/mental-health-strengthening-our-response

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