



UiT The Arctic University of Norway

Faculty of health science, UiT the Arctic University of Norway

Factors influencing life satisfaction of Norwegian adolescents: *A cross-sectional study from Ungdata.*

Sapana Dangol

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Supervisor: Hans Olav Melberg

Professor of health economics and health services research

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ABSTRACT

Background: Life satisfaction, an integral part of subjective well-being, is based on our cognitive assessment of our life's aim and achievement (1, 2). Previous studies have assessed life satisfaction primarily among adults, but there is a paucity of studies among adolescents (3-5). Also, research among adults involves factors such as job satisfaction, workplace ties, married life, and having children (6), which are irrelevant to adolescents. This study, therefore, investigated the factors influencing the life satisfaction of Norwegian adolescents and the gender-specific predictors of life satisfaction to provide a snapshot of adolescents' well-being in Norway.

Methods: The national youth survey, Ungdata, was used in this cross-sectional study. 139 841 Norwegian adolescents from lower and upper secondary schools participated in this survey in 2021. In this study, a total of 136 498 adolescents who scored on the life satisfaction scale were included. The Cantril Scale of 0-10 was used to assess life satisfaction. Based on the same scale, the mean life satisfaction was calculated. STATA/MP 17.0 was used to perform the analysis, and SPSS version 28.0 was used for generating bar diagrams and line graphs. Multiple linear regression was used to assess the effect of all the factors on life satisfaction. Furthermore, a gender-stratified multiple linear regression analysis was carried out to identify the gender-specific life satisfaction predictors among boys and girls.

Results: Most Norwegian adolescents were found to have an average level of life satisfaction with a mean Cantril Scale score of 7.08 on a scale of 0-10. A statistically significant association was found between life satisfaction and the independent variables, including educational level, family wealth, satisfaction with parents, friends, school, and living environment, engagement in physical activity, engagement in organized training, and bullying at a 5% significance level while the association with engagement in unorganized training was not statistically significant. The interaction between gender and life satisfaction was statistically significant. Norwegian boys had higher life satisfaction than adolescent girls. Loving parents and school dissatisfaction were the key influencers of life satisfaction among Norwegian adolescents.

Conclusion: The factors such as gender, educational level, family wealth, satisfaction with parents, friends, school and living environment, engagement in physical activity and organized training, and bullying thus influenced the life satisfaction of Norwegian adolescents.

Keywords: Life satisfaction, Cantril Scale, adolescents, Ungdata

ABBREVIATION

BMSLSS	Brief Multidimensional Students' Life Satisfaction Scale
COVID-19	Corona Virus Disease of 2019
CS	Cantril Scale
HBSC	Health Behavior in School-aged Children
HSCL-10	Hopkins Symptom Checklist
LSR	Life Satisfaction Rating
LSS	Lower Secondary School
MAPS	Multicultural Adolescents Panel Study (MAPS)
MSLSS	Multidimensional Student's Life Satisfaction Scale
NOVA	Norsk Institute for Forskning om Oppvekst, Velferd og Aldring
OECD	Organization for Economic Co-operation and Development
PA	Physical activity
QOL	Quality of Life
REK	Regional Committees for Medical and Health Research Ethics
SD	Standard Deviation
SE	Standard Error
SLSS	Student's Life Satisfaction Scale
SPSS	Statistical Package for the Social Sciences
SSB	Statistics Norway
SWLS	Satisfaction With Life Scale
USS	Upper Secondary School
VIF	Variance Inflation Factor

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CHAPTER I: INTRODUCTION

1.1 Background

Life satisfaction has a complex meaning and is often used conversely with happiness (7). Life satisfaction is defined as "*an endorsement of or positive attitude toward one's life overall*" (8). Life satisfaction indicates subjective well-being, representing an individual's life evaluation based on their aims and achievement (1, 2). Additionally, life satisfaction is vital to the quality of life (QOL) (9). It is also helpful to evaluate the progress of society based on multidimensional aspects of life, such as income, employment, work-life, health indicators, social relationships, safety, and quality of the environment (1, 10).

1.2 Norwegian life satisfaction

Norway surpasses the average in various aspects of well-being, for instance, in employment, work-life balance, education, health, environmental quality, social connections, safety, and life satisfaction, as compared to other nations, according to the Organization for Economic Cooperation and Development's (OECD) better living index (11). Additionally, the country has a score of 7.3 on the life satisfaction scale of 0-10, which is greater than the OECD average of 6.7 (11). Thus, Norway is among the highest among OECD countries with an average level of life satisfaction (11). The World happiness report of 2022 also ranked Norway as the 8th happiest country in the world and the 5th happiest country among the Nordic countries (12), as shown in *Figure 1*.

World Happiness Report 2022

Figure 2.1 Ranking of Happiness based on a three-year-average 2019-2021

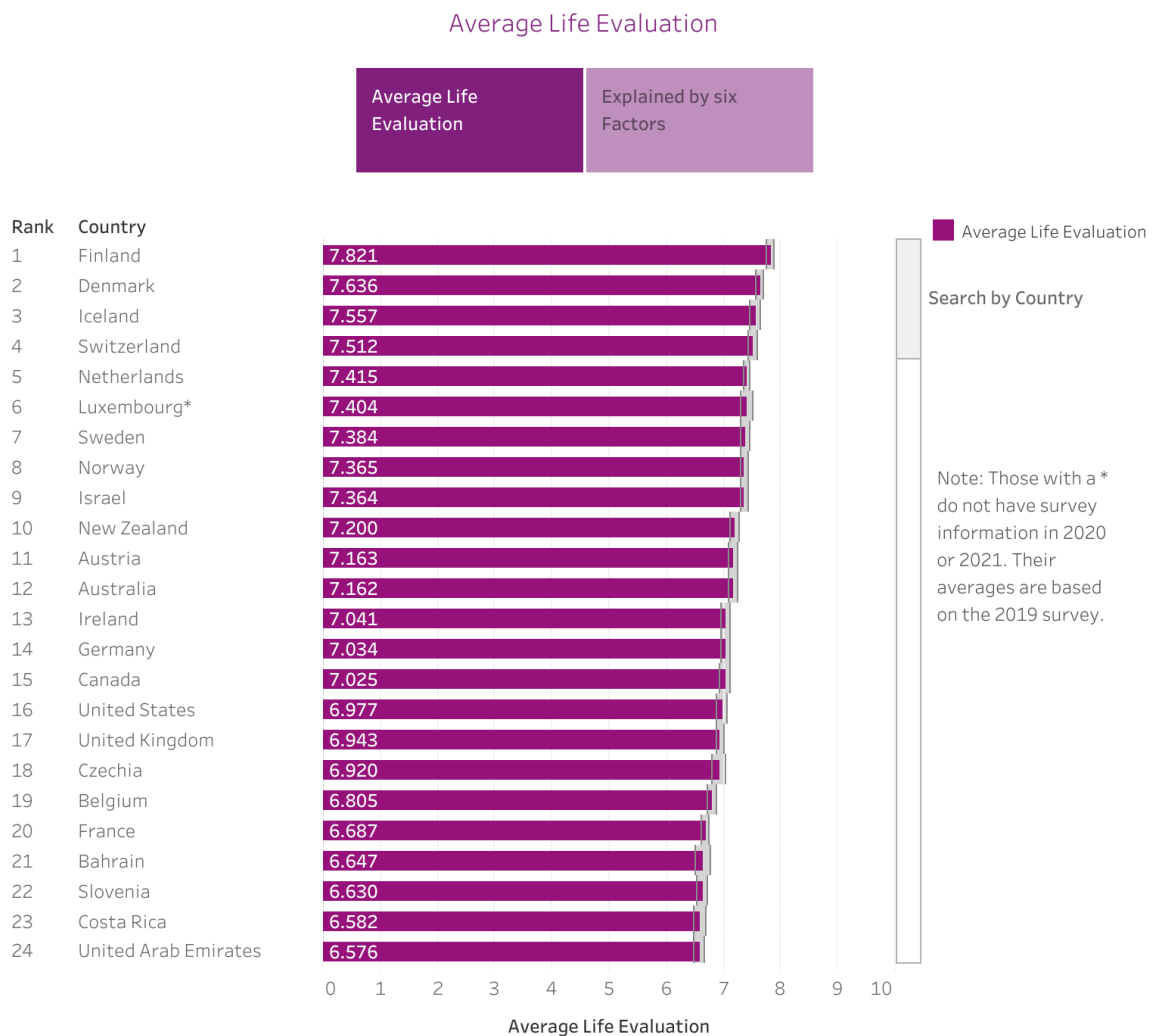


Figure 1: Rankings of happiest countries based on average life evaluation from 2019-2021 (12).

In 2021, a decline in high life satisfaction by five percentage points compared to 2020 was found in Norway by the national survey conducted by Statistics Norway (SSB), whereas most respondents who reported having an average level of life satisfaction were static in both years (13, 14). Furthermore, there was a decline in 10 out of 12 indicators of subjective well-being, including changes in living conditions, people with health issues and depressive symptoms, sleeping problems, low social contact, and loneliness (14). Such a decline in the share of people with high life satisfaction between 2020 and 2021 may be credited to a year of COVID-19 restrictions in the country (13, 14). The global outbreak of coronavirus disease (COVID-19) was declared a pandemic on March 11, 2020, and its impact remained significant worldwide

(15). With increased cases and evidence of rapid virus transmission in the community, the government of Norway imposed a national lockdown on March 12, 2020 (16). Due to the scarcity of studies on adolescents' overall life satisfaction in Norway, particularly in recent years following the COVID-19 pandemic, it is essential to research this important topic.

1.3 Significance of the Study

Adolescents (10-19 years) are in a transitional phase of life undergoing physical, psychological, and behavioral changes. Additionally, they are in a vulnerable stage where their behavior and lifestyle choices related to diet, physical activity, substance use, and sexual activity shape their life or put their health at risk later in life (17). Previous studies have found a strong association between reduced life satisfaction and substance abuse, such as tobacco smoking, consuming marijuana and cocaine, binge drinking (18), inappropriate sexual behavior (19), misleading perceptions about the body, unhealthy dieting behavior (20), physical inactivity (21), and depression (22). Hence, the study on adolescents' life satisfaction can help health promoters identify their exposure to such underlying risk factors.

Data on life satisfaction enable the quantification of the value of feelings and emotions of individuals. For instance, the psychological advantage of having a trustworthy community they live in, the emotional cost from unsatisfactory life events, the benefit of timely investigation of mental health problems, the value of protecting young people from adverse circumstances such as smoking, drug addiction, sexual abuse, and bullying victimization, and the advantage of training with social and emotional skills to upgrade their overall quality of life (23). Thus, identifying the predictors and risk factors influencing adolescents' life satisfaction is crucial for forming a base for early prevention, health promotion, and positive psychological development (24-27).

Life satisfaction is often studied among the adult population, and only limited studies have been able to capture findings on the happiness or well-being of adolescents (3-5). Moreover, life satisfaction in the adult population involves influencing factors such as job satisfaction, workplace ties, and married life and children (6), which may not be relevant to adolescents' lives. Elements including the academic environment, school setting, relationship with peers, and leisure activities are more pertinent for children (4) that life satisfaction studies among adults fail to address. Thus, it is crucial to determine the components of adolescent well-being and to gain insights into adolescent life satisfaction.

Furthermore, past studies suggest that adolescents are generally less satisfied than school-age/primary school children and older people (14, 28). The gap in life satisfaction between these groups is likely due to adolescents' various characteristics, such as mood swings, unusual behavior, psychosocial challenges, and cognitive maturity, which affect their actions, rational thinking, and emotional well-being during adolescence (28). It was also found that gender differences influence life satisfaction, as found by previous research (5, 29). Boys and girls differ in the emotional aspects of well-being (28), reacting to life experiences, and showing feelings (30). These characteristics affect life satisfaction, and thus it is significant to explore gender-specific predictors of life satisfaction for a comprehensive understanding of their needs in life and psychosocial development during adolescence (28).

1.4 Evaluation of life satisfaction

Life satisfaction can be measured using various methods and scales (5). Rose's tool, which includes a general question of "*How satisfied are you with your life?*" with a five-point Likert scale response ranging from very satisfied to very dissatisfied, was used in 1955 (31). The Life Satisfaction Rating (LSR) is also used for the satisfaction score of specific subcategories, for example, older adults (32). Furthermore, a short five-statement question in the Satisfaction with Life Scale (SWLS) has a seven-point scoring system from 1 (strongly disagree) to 7 (strongly agree), which is mainly used to evaluate one's cognitive judgment of their satisfaction with life (33).

A practical tool to assess general well-being, mental health, happiness, and general life satisfaction in various age groups is the Cantril Scale (CS) or Cantril Ladder. It is a vertical visual scale in the form of a ladder numbered from 0 to 10, where 0 at the bottom represents the worst possible life and 10 at the top represents the best possible life. This one-item scale is self-anchored, easy to administer, and efficient for respondents and the interviewer (34). CS became popular after its use in Gallup's World Poll of more than 150 countries in rating respondents' well-being in three distinct categories: thriving, struggling, and suffering (35). Since 2002, CS has been used in Health Behavior in School-aged Children (HBSC) surveys in more than 30 countries in Europe and North America among children aged 11, 13, and 15 years to evaluate the life satisfaction of adolescents in different countries and to perform a trend analysis (36). Investigators in the past have used this scale for QOL assessment (37), self-esteem studies (38), and social status evaluation (39). CS is considered a reliable scale for

measuring life satisfaction in adolescent samples and demonstrates good convergent validity in subjective health, perceived health, and emotional well-being (5).

Scales such as the Student's Life Satisfaction Scale (SLSS) and The Multidimensional Student's Life Satisfaction Scale (MSLSS) are also used to assess life satisfaction among children and adolescents. Moreover, the SLSS is a seven-statement question with a six-point scoring system from 1 (strongly disagree) to 6 (strongly agree) and adapted from the SWLS scale for children and young people aged eight and above (33, 40). Similarly, the MSLSS is a longer-scale questionnaire containing 40 statements and a 4-point Likert response ranging from 1 (never) to 4 (almost always). This scale was developed to assess positive psychological well-being among students, particularly those with differing cognitive abilities, and incorporates five key domains of life: family, friends, school, living environment, and self (24, 33).

Additionally, the Brief Multidimensional Students' Life Satisfaction Scale (BMSLSS), which is derived from MSLSS, is commonly used for swift and easy measurement of life satisfaction and perceived quality of life across the five specific domains of life among children and adolescents aged 8–18 years (24, 41). The BMSLSS is considered a reliable scale for measuring student life satisfaction and has acceptable internal consistency (42). This scale also demonstrates convergent solid validity with other life satisfaction scales, such as the MSLSS and SLSS (43, 44).

1.6 Research question and objectives

What are the factors influencing life satisfaction among adolescents in Norway?

The following are the objectives of this study to shed light on life satisfaction among Norwegian adolescents:

- To investigate the life satisfaction scores of Norwegian adolescents.
- To assess the predictors of life satisfaction (gender, education level, family wealth, satisfaction with parents, friends, school, local environment, and self, physical activity, bullying, and depressive symptoms) among Norwegian adolescents.
- To identify the gender-specific life satisfaction predictors among Norwegian boys and girls.

CHAPTER II: MATERIALS AND METHODS

2.1 Study design

This study was a quantitative cross-sectional study. The questionnaires used in this study were obtained from the National Ungdata Survey. The data for 2021 were considered the latest for adolescents' life satisfaction in this study.

2.1.1 About Ungdata

Ungdata is an annual Norwegian national youth survey conducted online during school hours. It is a comprehensive database that aims to collect information about adolescents' health and well-being from students at intermediate (grades 5-7), lower secondary (grades 8-10), and upper secondary school (years 1-3) at the municipal and national levels. The survey covered a comprehensive subject area via questions regarding parents, friends, school, local environment, leisure activities, health, and well-being. The students voluntarily participated in the survey and completed an anonymous web-based questionnaire. They are informed of the purpose of the survey and matters of privacy and preparedness. Parents of children below the age of 18 years also have the right to reserve their children from participating. Parents can inform the contact teacher about their children's participation before the survey. Thus, data from Ungdata are used in planning preventive and public health measures for young people at the municipal level (45).

2.2 Study population

The study population included adolescents from lower and upper secondary schools in Norway (grades 8-10 and years 1-3, respectively). A total of 139 841 adolescents participated in the Ungdata Survey in 2021. Adolescents who gave consent to participate in the survey and who scored the life satisfaction question (*Figure 3*) were included in this study (n=136, 498 adolescents). Adolescents who provided consent to participate but did not score the life satisfaction question were excluded from this study (n= 3, 343 adolescents). Adolescents who participated in the survey before or after 2021 were also excluded from this study. A clear view of the study population is shown in *Figure 2*.

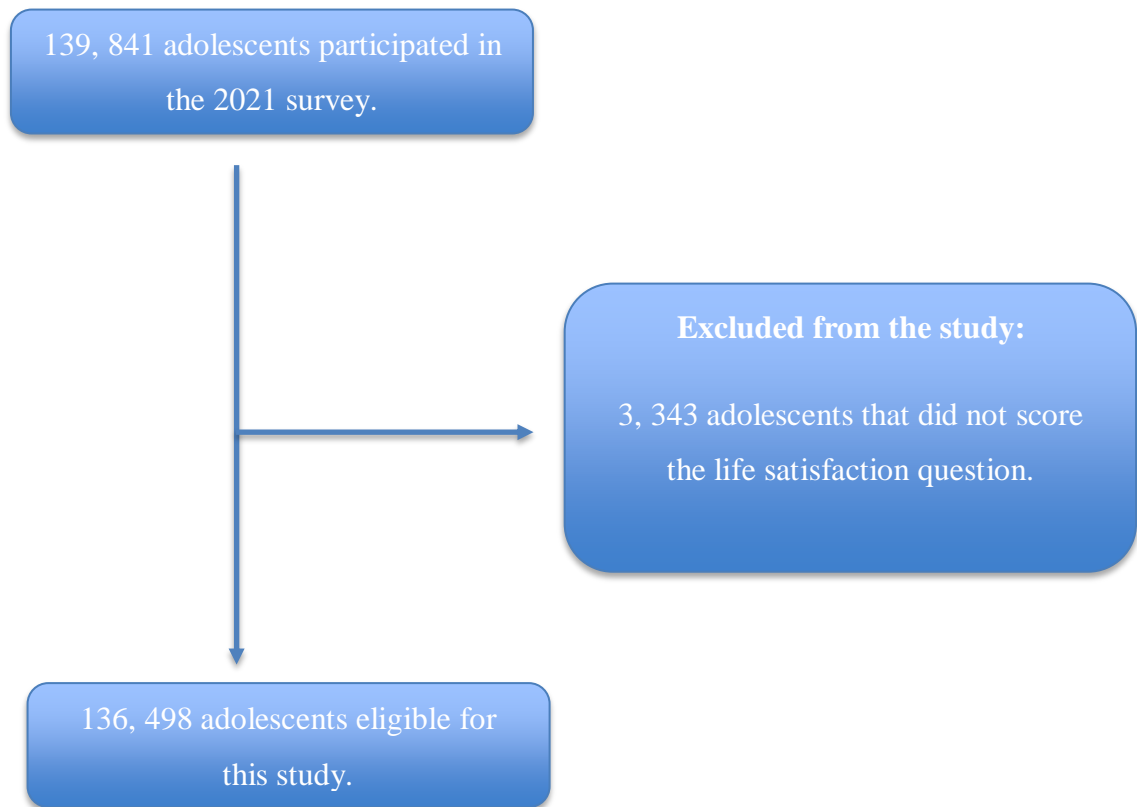


Figure 2: Flowchart of selection of study population

2.3 Study variables

2.3.1 Exposure variables

The demographic characteristics included in this study are as follows:

Gender: Gender was categorized as 1= boys and 2= girls.

Education level: The education level of the adolescents was an ordinal categorical variable, with grades 8-10 as lower secondary school and years 1-3 as upper secondary school.

Family wealth: Adolescents' family wealth was measured using the following questions:

1. "Financially, has your family been well off, or badly off, over the past two years?"
2. "My parents have almost no money to pay for the essentials (food, rent, telephone, and the like)."

Responses were recategorized as 1. Well-off (*We have been well off the whole time, or rarely or never is the case that my parents cannot afford the essentials*) 2. Neither well off nor badly off (*We have neither been well off nor badly off, or sometimes my parents cannot afford the*

essentials), and 3. Badly off (*We have been badly off the whole time, or often my parents cannot afford the essentials*).

The exposures based on the key domains of BMSLSS (24) are as follows:

i) Living environment: The living environment was measured using the following questions:

1. “How well do you feel in the immediate area where you live?”
2. “When you are out in the evening, do you feel safe to travel in the vicinity where you live (street, road, city center, or town)?”

Responses were recategorized as 1. Good and safe (*very/quite good or yes; very/quite safe*) 2. Unsure (*neither good nor bad, or not sure*) 3. Bad and unsafe (*very/quite bad or no, I do not feel safe*).

ii) Relationships with parents: This consists of four sub-variables.

Having parent's company: The company with parents was measured using the following questions:

1. “If you feel out of sorts or sad, do you have someone to talk to?”
2. “Do you experience family meals as cozy or pleasant?”

Responses were recategorized as 1. Yes (*yes or yes; as a rule or yes; always*) 2. No (*no or no; never or no; rarely*), and 3. Do not know.

Time spent with parents: The frequency of time spent with their parents was measured by the question, “In everyday life, how often are you with your parents?” Responses were recategorized as 1. Barely (*never or rarely*), 2. Occasionally (*sometimes*), and 3. Usually (*often or almost always*).

Feeling loved by parents: Feeling loved by parents was measured by the statement, “I felt loved by my parents or guardians.” Responses were recategorized as 1. Barely (*never or rarely*) 2. Occasionally (*sometimes*), and 3. Usually (*often or almost always*).

Family arguments: Arguments in the family were measured using the following statements:

1. “There are often arguments between the adults in my family.”
2. “I often argue with them.”

Responses were recategorized as 1. Yes (*very or quite true*), and 2. No (*not very true or not at all true*).

iii) Relationship with friends: This consists of two sub-variables.

Having a close and trustworthy friend: The friends' company was measured by the question, “Do you have at least one friend that you can completely trust and confide in about anything?”

Responses were recategorized as 1. Yes (yes; definitely or yes; I think so), and 2. No (I do not think so, or I have no one I would call a friend at the moment).

The feeling of fitting well with classmates: Fitting along with classmates was measured by the statement, “I feel that I fit in among the students at school.” Responses were recategorized as 1. Yes (*totally agree*) 2. Neutral (*somewhat agree or somewhat disagree*), and 3. No (*totally disagree*).

iv) School environment: This consists of five sub-variables.

Enjoyed school: School enjoyment was measured by the statement “I enjoy school.” Responses were recategorized as 1. Yes (*totally agree*) 2. Neutral (*somewhat agree or disagree*), and 3. No (*totally disagree*).

Bored at school: School boredom was measured by the statement “I am bored at school.” Responses were recategorized as 1. Yes (*totally agree*) 2. Neutral (*somewhat agree or disagree*), and 3. No (*totally disagree*).

Care from teachers: Receiving care from teachers was measured by the statement, “My teachers care about me.” Responses were recategorized as 1. Yes (*totally agree*) 2. Neutral (*somewhat agree or disagree*), and 3. No (*totally disagree*).

Dread going to school: Dreaded by the school was measured by the statement, “I often dread going to school.” Responses were recategorized as 1. Yes (*totally agree*) 2. Neutral (*somewhat agree or disagree*), and 3. No (*totally disagree*).

School stress: School stress was measured by the statement, “I get stressed by schoolwork.” Responses were recategorized as 1. Yes (*often or very often*) 2. Occasionally, and 3. No (never or rare).

v) Satisfaction with self: This consists of two sub-variables.

Opinion about their body: The opinion about their body was measured by the following questions:

1. “How satisfied are you with your weight?”
2. “Would you say about yourself that you are?”

Responses were recategorized as 1. Thin (*I weigh too little or very/quite thin*) 2. Just right (*I weigh the right amount*), and 3. Fat (*I weigh too much or very/quite fat*).

Satisfaction with body and appearance: Body and appearance satisfaction was measured using the following statements:

1. “I am happy with my body and changes to my body.”
2. “Physically, I feel healthy and strong.”

3. "I wish my body or looks were different."
4. "I am satisfied with how I want to look in the future."
5. "I often think I am ugly and unattractive."
6. "I look good."
7. "I am not happy with my appearance."
8. "I really like my appearance."

Responses were recategorized as 1. Yes (*very or quite true*), and 2. No (*not at all or not very true*).

Other important exposures are as follows:

Physical activity and training: This consist of three sub-variables.

Frequency of engagement in physical activity: The frequency of physical activity was measured by the question, "How often are you so physically active that you become short of breath or sweaty?" Responses were recategorized as 1. Never 2. Rarely active (*1-2 times a month*) 3. Lightly active (*1-2 times a week*), and 4. Moderately vigorously active (*at least three times a week or more*).

Engagement in organized training: Organized training included activities such as dance, martial arts, or similar. Responses were recategorized as 1. Never 2. Rarely active (*1-2 times a month*) 3. Lightly active (*1-2 times a week*), and 4. Moderately vigorously active (*at least three times a week*).

Engagement in unorganized training: Unorganized training included running, swimming, cycling, walking, and exercising independently. Responses were recategorized as 1. Never 2. Rarely active (*1-2 times a month*) 3. Lightly active (*1-2 times a week*), and 4. Moderately vigorously active (*at least three times a week*).

Bullying: This consists of two sub-variables.

Physical bullying: Adolescents getting bullied physically was measured by the question, "Are you yourself subjected to bullying, threats, or ostracism by other young people at school or in your free time?" Responses were recategorized as 1. Often (*several times a week or once a week*) 2. Sometimes (*approximately every 14 days or approximately once a month*) 3. Rare (*almost never*), and 4. Never.

Online bullying: Adolescents getting bullied online was measured by the question, "Are you being bullied, threatened, or banned online?" Responses were recategorized as 1. Often (*several times a week or once a week*) 2. Sometimes (*approximately every 14 days or approximately once a month*) 3. Rare (*almost never*), and 4. Never.

Depressive symptoms: The prevalence of depressive symptoms was measured using the Hopkins Symptom Checklist (HSCL-10), with six questions for depressive symptoms and four questions for anxiety symptoms (45). A cutoff point of 1.85 was considered. Those with a score <1.85 were considered not to have mental distress, whereas those with a score ≥ 1.85 were considered to have mental distress (46).

2.3.2 Outcome variable

Life satisfaction: Life satisfaction, the dependent variable in this study, was measured using the Cantril Scale, as shown in *Figure 3*. Adolescents were asked the question, “Where are you currently on a scale of 0-10 where 10 (top of the scale) represents the best possible life and 0 (bottom of the scale) represents the worst possible life?” (45). The Cantril Scale was derived from the HBSC study (36). Levels of life satisfaction were also categorized into low life (0-6), average life (7-8), and high life (9-10) based on guidelines from the HBSC protocol (34).

Imagine a scale from 0 to 10. The top of the scale (10) represents the best possible life for you, and the bottom (0) represents the worst possible life for you.	
In general, where are you currently on this scale?	
<input type="checkbox"/>	10 Best possible life (top of the scale)
<input type="checkbox"/>	9
<input type="checkbox"/>	8
<input type="checkbox"/>	7
<input type="checkbox"/>	6
<input type="checkbox"/>	5
<input type="checkbox"/>	4
<input type="checkbox"/>	3
<input type="checkbox"/>	2
<input type="checkbox"/>	1
<input type="checkbox"/>	0 Worst possible life (bottom of the scale)

Figure 3: Cantril Scale or Cantril ladder to measure life satisfaction among Norwegian adolescents on a scale of 0 (worst possible life) at the bottom of the scale to 10 (best possible life) at the top of the scale (45, 47).

2.4 Statistical analysis

An anonymous dataset from Ungdata was analyzed using STATA/MP 17.0, and bar diagrams and line graphs were generated using SPSS 28.0. The descriptive statistics of the mean and standard error (SE) were calculated for all independent variables of the continuous dependent variable (life satisfaction) on a CS of 0-10, as shown in *Table 1* and *Tables 5 and 6* in the

Appendix. Based on the HBSC protocol, three levels of life satisfaction were classified (34), and the proportion of adolescents at each level was computed. Chi-square (χ^2) was calculated to determine whether different independent variables were related to the dependent variable.

Multiple linear regression was carried out to examine the relationship between life satisfaction and the independent variables or to simply identify the predictors of life satisfaction, as shown in *Table 2*. All independent variables were entered simultaneously into the regression model to determine their overall effect on life satisfaction. Additionally, multiple linear regression analysis with a dummy coding scheme was carried out to determine the significant impact of each independent variable on life satisfaction. The results shown in *Table 3* thus helped to make comparisons between each category of independent variables and its specific reference category. Furthermore, the interaction between gender and life satisfaction was statistically significant; hence, a gender-stratified analysis was performed, as shown in *Table 4*.

In the regression tables, the standardized beta coefficient (β) was used to identify the direction of the relationship (positive or negative) with life satisfaction and to compare the magnitude of multiple predictors to determine the strength of the relationship. The key positive and negative predictors of life satisfaction in the gender-specific analysis were determined based on the comparison of the larger absolute values of β . The standardized beta coefficient (β) for each independent variable was interpreted in comparison to 1 S.D. and holding other variables constant. The reference category for each variable is denoted by *Ref*, as listed in *Table 5*. The p-value <0.05 was considered statistically significant at the 5% significance level. Before running the analysis, the statistical assumption of linearity was verified by running the test for linearity. Significant linearity was found between life satisfaction and the independent variables. A multicollinearity diagnostic test was run to check for multicollinearity between the independent variables. No multicollinearity was found between them, as VIF was less than 4 (VIF <4) (48).

2.5 Missing data:

Out of 139 841 Norwegian adolescents participating in the Ungdata survey for the year 2021, there were 3 343 missing data on the dependent variable (Life satisfaction). This missing number of 3 343 were adolescents who did not score the life satisfaction question on a 0-10 scale. In addition, each of the independent variables had missing data that were not excluded during the analysis. The missing data for each variable are noted on the leftmost side of the table, as shown in *Table 1* and *Tables 5* and *6* in the Appendix. Moreover, variables with a high

percentage of missing data (90% or more) were excluded from the analysis. These variables were the prevalence of depressive symptoms and satisfaction with oneself (opinion on one's body weight and satisfaction with one's body and appearance).

2.6 Data Safety

NOVA took care of the confidentiality of participants' answers in the survey. A data protection officer at Oslo Met approved the Ungdata survey. Only the researchers in the project and the company that registers the responses will have access to the dataset. In addition, the dataset did not contain any direct personal data. Once the survey is completed, the data cannot be corrected or erased (45).

2.7 Ethical approval

REK was not required in this study as the data were anonymous, and it was impossible to recognize any participants. The Ungdata survey conducted online during school hours is voluntary, and participants can choose to answer all questions or skip them. The survey data were processed based on participants' consent (45).

CHAPTER III: RESULTS

3.1 Demographic findings

Table 1: Descriptive statistics of the demographic characteristics of Norwegian adolescents based on the CS score and the levels of life satisfaction.

Variables	Total %	Cantril Scale Score		Cantril Level (N=136 498)			Missing %
		Mean	S.E.	Low life N=42 993	Average life N=61 469	High life N=32 036	
Life satisfaction	-	7.08	0.005	31.5%	45.0%	23.5%	-
Gender							
Boys	48.6%	7.52	0.007	22.3%	47.4%	30.3%	2.22%
Girls	49.2%	6.71	0.008	39.5%	43.4%	17.0%	
Education level							
Year 8	19.5%	7.28	0.012	28.1%	42.6%	29.3%	2.5%
Year 9	19.3%	7.09	0.012	31.7%	44.2%	24.1%	
Year 10	19%	7.07	0.012	31.7%	44.5%	23.9%	
Year 1 Upper SS	16.6%	7.08	0.013	31.8%	46.0%	22.3%	
Year 2 Upper SS	14%	6.99	0.014	33.0%	47.6%	19.5%	
Year 3 Upper SS	9.2%	6.85	0.016	35.6%	48.4%	16.0%	
Family wealth							
Well off	78.3%	7.33	0.006	26.5%	47.0%	26.5%	2.7%
Neither well off nor badly off	15.1%	6.34	0.014	47.6%	41.0%	11.4%	
Badly off	4%	5.19	0.033	67.1%	25.5%	7.5%	

Note: The χ^2 test had the p-value <0.001 i.e. statistically significant for the above independent variables

Table 1 presents the demographic characteristics of Norwegian adolescent boys and girls. Of the 136 498 adolescents who scored on the life satisfaction scale (*Figure 3*), the majority (about 60,000) reported an average level of life satisfaction, with a mean Cantril Scale score of 7.08 on a scale of 0-10. In Norway, more adolescent boys (30%) reported having higher levels of life satisfaction than adolescent girls (17%). The mean CS score was 7.52 and 6.71 on a scale

of 0-10 among boys and girls, respectively. As adolescents reached upper secondary school (Year 3), there was a decline in adolescents reporting high levels of life satisfaction in more than half of the adolescents in lower secondary school (Grade 8). Furthermore, most of the adolescents who reported having an average and high level of life satisfaction were from well-off families, and the majority of adolescents who reported having a low level of life satisfaction were from badly-off families.

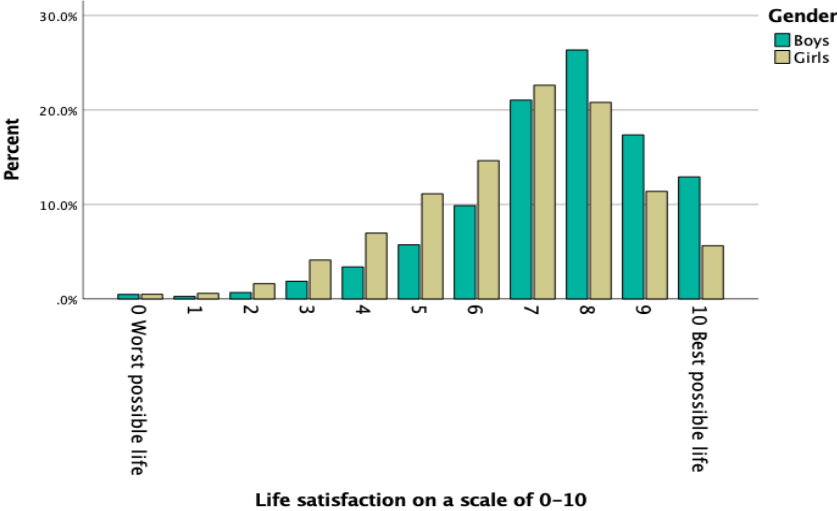


Figure 4: Life satisfaction on a Cantril Scale of 0-10 among Norwegian adolescents by gender.

Figure 4 depicts the life satisfaction of Norwegian boys and girls on a Cantril Scale of 0-10, where the majority of boys scored 8, and the majority of girls scored 7 on 0-10, illustrating that they had an average level of life satisfaction.

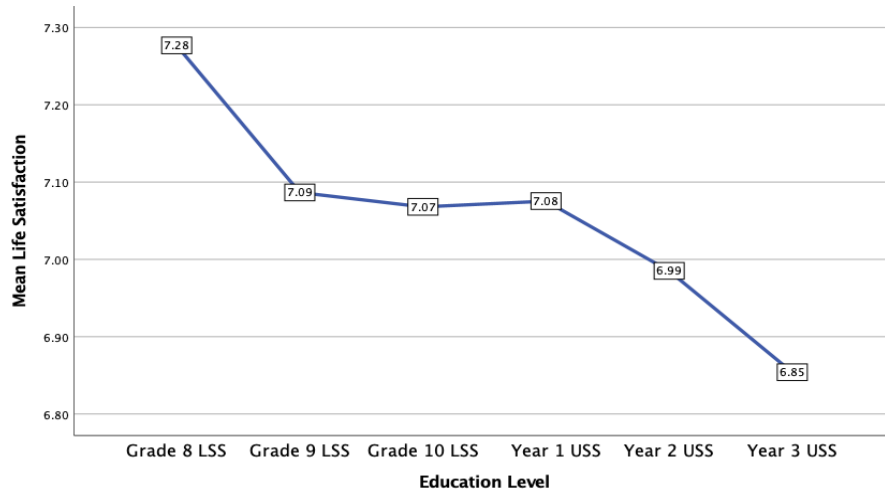


Figure 5: The mean CS score of Norwegian adolescents by their education level.

Figure 5 depicts Norwegian adolescents' mean CS score based on their educational level, where life satisfaction declined as they upgraded from lower secondary to higher secondary school.

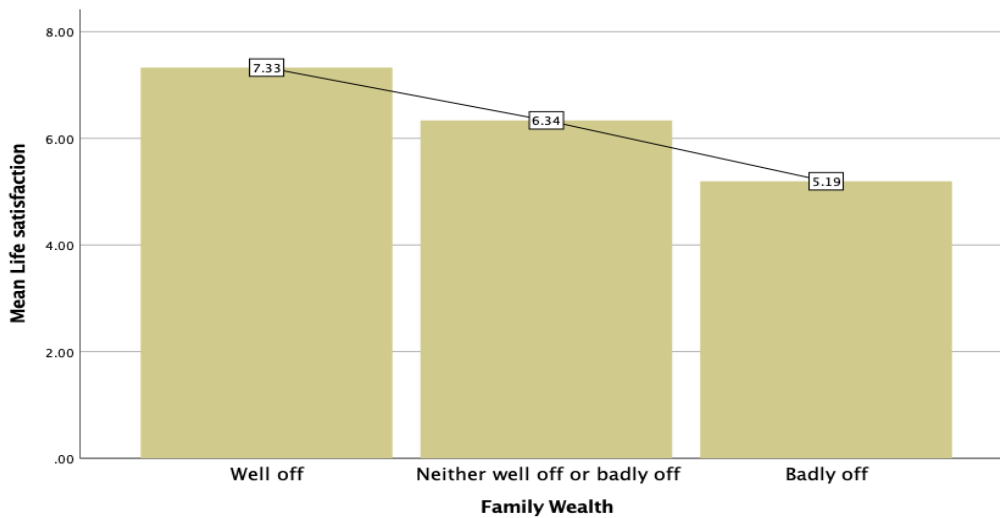


Figure 6: The mean CS score of Norwegian adolescents by family wealth.

Figure 6 depicts the mean CS score of Norwegian adolescents based on their family wealth, showing a decrease in life satisfaction with a reduction in family wealth.

3.2 Descriptive findings of independent variables

As shown in *Table 5* in the Appendix, under the key domains of the BMSLSS, the majority (about 50%) of adolescents' average level of life satisfaction was determined by a good and safe living environment, having parents' company, spending time with parents occasionally or usually, feeling loved by parents usually, having no arguments in the family, having a close/trustworthy friend and fitting well with classmates, enjoying school, not dreaded going to school, getting stress by schoolwork occasionally, having just right body weight, and satisfaction with their body and appearance.

In addition, as shown in *Table 6* in the Appendix, the majority (about 50%) of adolescents' average level of life satisfaction was determined by involvement in moderate-vigorous physical activity, lightly active in organized and unorganized training, never being bullied physically and online, and not having depressive symptoms.

3.3 Regression analysis

Table 2: A multiple linear regression analysis between life satisfaction and independent variables (without categories) among Norwegian adolescents: Output of multiple linear regression

Independent variables	Standardized β	S.E.	p-value
Gender (Girls)	-0.123	0.009	<0.001*
Year 3 Upper SS (Education level)	-0.051	0.003	<0.001*
Badly-off family wealth	-0.090	0.009	<0.001*
Bad and unsafe living environment	-0.052	0.009	<0.001*
No parents' company	-0.087	0.006	<0.001*
Time spent with parents usually	0.079	0.007	<0.001*
Felt loved by parents usually	0.159	0.010	<0.001*
No family arguments	0.035	0.013	<0.001*
Not having close/trustworthy friend	-0.037	0.015	<0.001*
Not fitting well with classmates	-0.111	0.009	<0.001*
Not enjoying school	-0.163	0.010	<0.001*
Not bored at school	0.034	0.009	<0.001*
Not receiving care from teachers	-0.024	0.009	<0.001*
Not dreaded going to school	0.081	0.009	<0.001*

Not stressed by schoolwork	0.099	0.006	<0.001*
Engagement in physical activity (PA)	0.016	0.006	<0.001*
Involved in organized training	0.012	0.005	<0.001*
Involved in unorganized training	0.002	0.004	0.362
Never being bullied (physically)	0.035	0.007	<0.001*
Never being bullied (online)	0.057	0.009	<0.001*
<i>Adjusted R²</i>	0.3962		
* Statistically significant at 0.05 level			

Table 2 shows the results of the multiple linear regression analysis of life satisfaction and the various independent variables. A negative relationship between gender and life satisfaction was found, illustrating that Norwegian adolescent girls had a life satisfaction score of 0.123 standard deviations (S.D.) lower than adolescent boys. Adolescents also had decreasing life satisfaction scores in upper secondary school (Year 3). Additionally, family wealth was found to affect the life satisfaction of adolescents. Norwegian adolescents from badly-off families had a life satisfaction score of 0.090 standard deviations (S.D.) lower than that of well-off families.

In addition to that, factors including bad/unsafe living environment, detachment from social relationships (not having a parent company or a close/trustworthy friend), and adverse school environment (not fitting well with classmates, not enjoying school, not receiving care from teachers) had a negative effect on the life satisfaction of Norwegian adolescents. Similarly, good relationships with parents and a suitable home environment (having no family arguments, an increase in the level of feeling loved by parents, and time spent with parents from barely to usually) had a favorable impact on their life satisfaction. Moreover, school satisfaction (not being bored or dreaded of school and not being stressed by schoolwork) also had a notable positive effect on their life satisfaction. The other factors that positively affected the life satisfaction of adolescent boys and girls were engagement in physical activity and organized training and never encountering bullies physically or online.

Thus, all the listed independent variables in Table 2 had a statistically significant association with life satisfaction ($p < 0.001$), except for the independent variable engagement in unorganized training ($\beta = 0.002$; S.E. = 0.004; $p = 0.362$) in this study. Among the statistically significant variables, feeling loved by parents (an increase in life satisfaction by 0.159 S.D. from barely to usually) was the strongest positive predictor of life satisfaction among

Norwegian adolescents. On the other hand, school dissatisfaction or not enjoying school (a decrease in life satisfaction by 0.163 S.D.) was a robust negative predictor of life satisfaction in Norwegian adolescents. Thus, the listed independent variables explain 39.6% of the total variability in life satisfaction.

Table 3: A multiple linear regression analysis between life satisfaction and independent variables (with categories) among Norwegian adolescents: Output of multiple linear regression

Independent Variables	Standardized β	S.E.	p-value
<i>Gender</i>			
<i>Boys</i>	<i>Ref</i>	<i>Ref</i>	<i>Ref</i>
Girls	-0.124	0.009	<0.001*
<i>Education level</i>			
<i>Grade 8 Lower SS</i>	<i>Ref</i>	<i>Ref</i>	<i>Ref</i>
Grade 9 Lower SS	-0.011	0.014	< 0.001*
Grade 10 Lower SS	-0.002	0.014	0.605
Year 1 Upper SS	-0.037	0.015	<0.001*
Year 2 Upper SS	-0.042	0.016	<0.001*
Year 3 Upper SS	-0.047	0.018	<0.001*
<i>Family wealth</i>			
<i>Well-off</i>	<i>Ref</i>	<i>Ref</i>	<i>Ref</i>
Neither well off nor badly off	-0.059	0.013	<0.001*
Badly off	-0.072	0.024	<0.001*
<i>Living Environment</i>			
<i>Good and safe</i>	<i>Ref</i>	<i>Ref</i>	<i>Ref</i>
Unsure	-0.041	0.013	<0.001*
Bad and unsafe	-0.030	0.024	<0.001*
<i>Parents Company</i>			
<i>Yes</i>	<i>Ref</i>	<i>Ref</i>	<i>Ref</i>
No	-0.077	0.019	<0.001*
Do not know	-0.080	0.013	<0.001*
<i>Time spent with parents</i>			
<i>Barely</i>	<i>Ref</i>	<i>Ref</i>	<i>Ref</i>
Occasionally	0.039	0.018	<0.001*

Usually	0.106	0.017	<0.001*
<i>Felt loved by parents</i>			
<i>Barely</i>	<i>Ref</i>	<i>Ref</i>	<i>Ref</i>
Occasionally	0.085	0.026	<0.001*
Usually	0.212	0.024	<0.001*
<i>Arguments in the family</i>			
Yes	<i>Ref</i>	<i>Ref</i>	<i>Ref</i>
No	0.033	0.013	<0.001*
<i>Close and trustworthy friend</i>			
Yes	<i>Ref</i>	<i>Ref</i>	<i>Ref</i>
No	-0.026	0.015	<0.001*
<i>Fit well with classmates</i>			
Yes	<i>Ref</i>	<i>Ref</i>	<i>Ref</i>
Neutral	-0.086	0.011	<0.001*
No	-0.093	0.025	<0.001*
<i>Enjoy school</i>			
Yes	<i>Ref</i>	<i>Ref</i>	<i>Ref</i>
Neutral	-0.130	0.011	<0.001*
No	-0.126	0.031	<0.000*
<i>Bored at school</i>			
Yes	<i>Ref</i>	<i>Ref</i>	<i>Ref</i>
Neutral	0.027	0.011	<0.001*
No	0.033	0.022	<0.001*
<i>Care from teachers</i>			
Yes	<i>Ref</i>	<i>Ref</i>	<i>Ref</i>
Neutral	-0.021	0.010	<0.001*
No	-0.014	0.028	<0.001*
<i>Dread going to school</i>			
Yes	<i>Ref</i>	<i>Ref</i>	<i>Ref</i>
Neutral	0.063	0.02	<0.001*
No	0.128	0.021	<0.001*
<i>Stress by schoolwork</i>			
Yes	<i>Ref</i>	<i>Ref</i>	<i>Ref</i>

Occasionally	0.071	0.011	<0.001*
No	0.098	0.013	<0.001*

Frequency of physically active

<i>Never</i>	<i>Ref</i>	<i>Ref</i>	<i>Ref</i>
Rarely active	-0.014	0.035	0.029*
Lightly active	-0.002	0.034	0.763
Moderately-Vigorously active	0.004	0.034	0.650

Engagement in organized training

<i>Never</i>	<i>Ref</i>	<i>Ref</i>	<i>Ref</i>
Rarely active	0.009	0.018	<0.001*
Lightly active	0.008	0.017	0.001*
Moderately-Vigorously active	0.008	0.020	<0.001*

Engagement in unorganized training

<i>Never</i>	<i>Ref</i>	<i>Ref</i>	<i>Ref</i>
Rarely active	0.000	0.013	0.983
Lightly active	-0.003	0.013	0.322
Moderately-Vigorously active	0.003	0.014	0.280

Bullied by others physically

<i>Often</i>	<i>Ref</i>	<i>Ref</i>	<i>Ref</i>
Sometimes	0.006	0.030	0.108
Rarely	0.019	0.026	0.001*
Never	0.052	0.025	<0.001*

Bullied or banned online

<i>Often</i>	<i>Ref</i>	<i>Ref</i>	<i>Ref</i>
Sometimes	0.010	0.041	0.007*
Rarely	0.056	0.036	<0.001*
Never	0.099	0.035	<0.001*

* Statistically significant at 0.05 level

Note: Standardized coefficient (β) for each independent variable was interpreted in comparison to 1 S.D. and holding other variables constant. Reference category for each variable is denoted by Ref.

Table 3 illustrates the results of the multiple linear regression analysis between life satisfaction and the independent variables with their categories. The significant effects of each category on life satisfaction can be explained by the findings in *Table 3*. Adolescents' educational level was found to influence their life satisfaction. For instance, the coefficient was steeply dropped from -0.011 S.D. in grade 9 of the LSS to -0.037 S.D. in year 1 of USS. The declining trend continued until adolescents progressed to year 3 of the USS. Thus, the decreasing beta coefficient with the increasing education level of the adolescents illustrates that adolescents in upper secondary school (year 1 to year 3 USS) were less satisfied with life than those in lower secondary school (grade 8 to grade 10 LSS).

Most findings on the relationship between the independent variables and life satisfaction in the regression analysis with categories remained unchanged. However, the results for some specific categories of the independent variables in *Table 3* showed a non-significant relationship with life satisfaction on further expansion. For example, adolescents from grade 10 of lower secondary school ($\beta=-0.002$; S.E.=0.014; $p=0.605$), those who were engaged in light physical activity ($\beta=-0.002$; S.E.=0.034; $p=0.763$) to moderate-vigorous physical activity ($\beta=0.004$; S.E.=0.034; $p=0.650$), and those who were sometimes physically bullied ($\beta=0.006$; S.E.=0.030; $p=0.108$) were found not statistically significant. Earlier regression analysis without categories in *Table 2* concealed these findings.

Additionally, adolescents' engagement in physical activity had a two-edged effect on their life satisfaction. The overall impact of physical activity on life satisfaction, as shown in *Table 2*, indicated a statistically significant relationship ($\beta=0.016$; S.E.=0.006; $p<0.001$). However, the results of categories-wise regression in *Table 3* illustrate that there was no significant association between life satisfaction and adolescents' engagement in light and moderate-vigorous physical activity ($p=0.763$ and $p=0.650$, respectively). Thus, engagement in physical activity positively impacted adolescents' life satisfaction, but the increase in life satisfaction was not necessarily influenced by engagement in light- to moderate-vigorous physical activity.

Table 4: Independent variables and life satisfaction among Norwegian adolescents specific for gender subgroup: Output of multiple linear regression at a 5% significance level.

Independent Variables	Boys		Girls	
	Standardized β	S.E.	Standardized β	S.E.
Year 3 Upper SS (Education level)*	-0.081	0.004	-0.027	0.004
Badly-off family wealth*	-0.106	0.013	-0.081	0.013
Bad and unsafe living environment*	-0.051	0.015	-0.052	0.012
No parents' company*	-0.082	0.009	-0.092	0.009
Time spent with parents usually*	0.085	0.010	0.076	0.011
Felt loved by parents usually*	0.152	0.016	0.166	0.014
No family arguments*	0.028	0.019	0.042	0.018
Not having close/trustworthy friend*	-0.039	0.020	-0.038	0.022
Not fitting well with classmates*	-0.137	0.013	-0.087	0.014
Not enjoying school*	-0.165	0.014	-0.166	0.015
Not bored at school*	0.034	0.012	0.036	0.013
Not receiving care from teachers*	-0.024	0.013	-0.025	0.013
Not dreaded going to school*	0.052	0.012	0.109	0.013
Not stressed by schoolwork*	0.097	0.008	0.102	0.011
Engagement in PA*	0.010	0.008	0.022	0.008
Involvement in organized training*	0.019	0.009	0.009	0.007
Involvement in unorganized training	-0.005	0.006	0.007	0.007
Never being bullied (physically)*	0.037	0.009	0.035	0.010
Never being bullied (online)*	0.057	0.012	0.060	0.013
<i>Adjusted R²</i>	<i>0. 3551</i>		<i>0. 3821</i>	
<i>Statistically significant at 0.05 level</i>				

Table 4 depicts the results of multiple linear regression analysis between life satisfaction and gender-specific independent variables to identify better predictors of life satisfaction among boys and girls. The listed independent variables explain 35.5% and 38.2% of the total variability in life satisfaction among boys and girls, respectively.

Among boys, independent variables, particularly upper secondary school, badly-off family wealth, not having a close/trustworthy friend, and not fitting well with classmates better reflected the negative influence on their life satisfaction. Similarly, variables such as time spent with parents usually, being involved in organized training, and never being physically bullied predicted a larger positive effect on the life satisfaction of boys.

Among girls, independent variables, particularly bad/unsafe living environment, not having parents' company, not enjoying school, and not receiving care from teachers, better reflected the negative influence on their life satisfaction. Similarly, variables such as feeling loved by parents usually, having no family arguments, not being bored or dreadful going to school, not being stressed by schoolwork, engaging in PA, and never being bullied online predicted a larger positive effect on the life satisfaction of girls.

Additionally, one S.D. increase in education level from lower to upper secondary school was associated with a more pronounced decrease in life satisfaction in boys than in girls. Boys engaged in organized training from never to moderate-vigorous were roughly double as satisfied with their life as the girls, suggesting that boys experience more life satisfaction from participating in organized training such as dance and martial arts. Furthermore, girls with no family arguments and who do not dread going to school were almost twice as satisfied with their life than boys, showing that a peaceful family and school environment has a more profound positive influence on their life satisfaction.

It is also evident that boys and girls who usually felt loved by their parents ($\beta = 0.152$ and $\beta = 0.166$ respectively) are twice as much happier in life than the girls and boys who usually spend time with their parents ($\beta = 0.076$ and $\beta = 0.085$ respectively). Hence, parents' care and affection were vital for their life satisfaction. Also, boys and girls who never got bullied online reported having about twice as much life satisfaction as those who never got physically bullied. This indicates that cyberbullying, which has emerged as a novel rage in the new generation, can have a severe detrimental impact on the life of adolescents (49).

CHAPTER IV: DISCUSSION

4.1 Summary of main findings

This study's main aim was to discover the factors influencing life satisfaction among Norwegian adolescents. Life satisfaction was measured on the Cantril Scale of 0-10, adapted from the HBSC study. This study found that Norwegian adolescents have an average level of life satisfaction with a mean CS score of 7.08 on a scale of 0-10. A positive statistically significant association was found between life satisfaction and the independent variables, including good relationships with parents (having no family arguments, an increase in the level of feeling loved by parents, and time spent with parents from barely to usually), school satisfaction (not being bored or dreaded of school and not being stressed by schoolwork), engagement in physical activity and organized training, and never encountering bullies physically or online at a 5% significance level. Similarly, a negative statistically significant association was found between life satisfaction and the independent variables, including bad/unsafe living environment, detachment from social relationships (not having a parent company or a close/trustworthy friend), and an adverse school environment (not fitting well with classmates, not enjoying school, not receiving care from teachers) at a 5% significance level. However, no statistically significant association was found between life satisfaction and engagement in unorganized training at a 5% significance level.

Additionally, loving parents and school dissatisfaction (not enjoying school) were the key positive and negative influencers of life satisfaction among Norwegian adolescents. Family wealth was also found to influence life satisfaction, with Norwegian adolescents from badly-off families having low life satisfaction than those from well-off families. Another significant finding was the decrease in life satisfaction of adolescents with the increase in the education level from lower to higher secondary school. This effect was more pronounced in boys than in girls.

The interaction between gender and life satisfaction was found to be statistically significant. Norwegian boys had higher life satisfaction than girls. The better predictors of life satisfaction also varied between Norwegian boys and girls. For example, boys from upper secondary school and those without friends' company had profound life dissatisfaction, while girls without parents' company, having bad/unsafe living environments, and dissatisfied with school (not enjoying school, not receiving care from teachers) had greater life dissatisfaction. Similarly, in

boys, variables such as time spent with parents usually, being involved in organized training, and never being physically bullied had a positive impact on their life satisfaction while, in girls, variables such as a good relationship with parent (feeling loved by parents usually and having no family arguments), school satisfaction (not being bored or dreadful going to school and not being stressed by schoolwork), engagement in PA, and never being bullied online, had a positive impact on their life satisfaction.

4.2 Comparison with previous studies

The World Happiness Report 2022 found that Norwegians had an average level of life satisfaction with a mean CS score of 7.36 on a scale of 0-10, similar to my study findings on Norwegian adolescents. Similarly, other Nordic countries were found to have an average level of life satisfaction in general (approximate CS score of 7 on 0-10), with Finland being the happiest country (CS score of 7.08 on 0-10) between 2019-2021 (12). The possible explanation for satisfaction with life in Nordic countries is that people prioritize life balance, harmony, and peace, which are the essential aspects of life satisfaction (12). Additionally, these aspects are determined by people's social and economic situation (50). Thus, families and social environments are the foundation of nurturing positive attitudes and behavior, moral values, and peace and harmony among children and adolescents (51). Such a balanced and harmonious environment that families and communities of these countries create, for the emotional development of the adolescent (52), along with the country's economic stability (53), may explain the average level of life satisfaction in Norwegian adolescents.

Previous studies have found the results consistent with my study concerning life satisfaction predictors. In earlier studies, factors such as good relationships with parents, interaction with friends, and the favorable school environment positively influenced adolescents' life satisfaction, which is similar to my study results. For example, having social support from parents/families and friends/peers had a positive effect on the life satisfaction of adolescents regardless of belonging to different countries, such as in China (54-56), Korea (57), and Poland (34). School environment and school life satisfaction were also considered the significant predictors of academic success, perceived school/college stress, and life satisfaction in American and European adolescents, including the Latino (58), Hispanic (59), Polish (34), and mid-Norwegian (60) students. Thus, the fact that parents, friends, and school are the major components of adolescents' surrounding environment (61), source of support and happiness (62), contributors to adolescent's social development (63) and healthy lifestyle adoption (64)

may help explain such consistent positive findings between these predictors and life satisfaction.

Among the relationship with parents, feeling loved by parents better predicted the positive life satisfaction of the adolescents in my study. Such intrinsic support, i.e., the perception of adolescents on feeling loved and cared for by their parents, was also evident in a study by the Foundation for Child Development and Child Trends of the United States (65). The multifaceted parental support provides ground for adolescents' happiness and well-being through acceptance, responsiveness, affection, and companionship. In addition, adolescents with parental support develop an open-communication, expressive nature, and strengthened rapport (66, 67). Thus such a warm parent-child relationship from parental support is likely to explain the positive dynamics between loving parents and adolescents' life satisfaction.

Moreover, adolescents not enjoying school better predicted the negative life satisfaction in this study. School-related satisfaction and dissatisfaction were found particularly among girls in my study, illustrating that the school environment substantially affected their life. School life, where adolescents spend most of their time and have several life experiences, provides an important context for their development (68). The factors that make school life unenjoyable maybe not having a friendly and supportive school environment, an unsatisfactory teacher-student relationship (68), poor peer networks and socializing (69), conflict with their peers (70), and mental stress and psychological distress (71). Adolescent girls in my study reported that not receiving care from teachers had a negative impact on their life satisfaction. Also, the previous study by NOVA found that negative psychological symptoms were higher in Norwegian girls than in boys (72, 73). Such perception of teachers' care and psychological distress in girls may explain the negative relationship between school dissatisfaction and life satisfaction.

Similarly, the life satisfaction of Norwegian adolescents decreased with a decrease in the family wealth from well-off to badly off in my study. The earlier investigations also found similar results on family wealth influencing adolescents' life satisfaction. For instance, a pronounced increase in adolescents' life satisfaction with an increase in family wealth was found among Polish (34) and Chilean and Spanish adolescents (74). Family wealth is likely to be associated with adolescents' life satisfaction as it determines the accessibility to necessities and subsequent quality of life (75), their cognitive development, educational outcome, and stress in the family (76), and the situation of their parent's well-being and parenting practices (77).

The past research has found the results congruent with my study on bullying and adolescents' life satisfaction. For example, elevated bullying was associated with lower levels of life satisfaction among adolescents from Canada and North America in the HBSC 2013/14 study, among Spanish (78), Chilean (49, 79), Brazilian (49), and in the Asian such as Chinese (80) and Vietnamese (81) adolescents. The possible explanation for bullying victimization related to adolescents' low life satisfaction may likely be associated with its negative psychological consequences such as poor mental health, anxiety, and depression (82, 83), problems in maintaining relationships, loneliness, difficulty in expressing feelings, and increased school absenteeism and school failure (84). Moreover, adolescents who reported never being bullied online were more satisfied with life in my study. Online bullying may seriously impact adolescents' life satisfaction. The upsurge of advanced communication technologies has allured children and adolescents to the time-consuming usage of social media applications (85). Such engagement has exposed them to aggressive and insulting messages and feedback in online interactions (86), misuse of their personal information and photos, and risky interactions with many strangers (87). Cyberbullying, which occurs at any time of the day or night by an anonymous attacker (88), thus increases adolescents' vulnerability to psychological and emotional impacts (86).

Another finding of my study was a decrease in life satisfaction as adolescents transitioned from lower secondary to upper secondary school, with a more pronounced change in life satisfaction among boys than girls. Earlier research on children from different countries across Africa, Asia, Europe, and North and South America also revealed that older children reported lower life satisfaction as their age increased (89). The declining life satisfaction with an increase in age or as they reach upper secondary school may be related to increased school-related challenges and stress and peer-related problems (90). As factors such as not having a close/trustworthy friend and not fitting well with classmates predicted the negative life satisfaction of Norwegian boys in my study, the peer relationship may account for such a decrease in their life satisfaction with a progression to upper secondary school. The reserved communication, lack of intimacy, and mutual understanding in boys' friendship in adolescence which is unlikely in girls' friendship (91), may also suggest the reduced level of life satisfaction in boys.

In line with my findings on Norwegian boys having higher life satisfaction than girls, a similar result was found in the study on mid-Norwegian adolescents (29). Even from entirely different cultures than Norway, previous studies have also seen consistent findings on life satisfaction disparities among boys and girls, for instance, a study in Urumqi city of Western China (54),

Korea (57), and Scotland (92). Such consistent findings on lower life satisfaction in girls than in boys could be linked to girls' lower perceptions about their body image (93, 94), their added sensitivity towards attachment with parents and peers (95), and experiences of drastic physical change during puberty, clash with societal beauty standards and imbalanced emotions (28). The increased negative psychological symptoms in Norwegian girls, as found in previous research by NOVA than in boys (72, 73), may also add up to lower life satisfaction among girls. Also, the ability of the girls to identify and express the emotional distress in their life compared to boys (96) may have resulted in open and honest answers about their life experiences. On the other hand, the boys have difficulties admitting their problems or can hide them (96), which may have led to underreporting of their life problems or life dissatisfaction aspects.

Furthermore, the findings related to gender differences in life satisfaction are contradicting. Prior surveys, for example, the study done in 43 countries and regions of the WHO European Region and North America in 2009/2010 (97), among Chilean and Spanish adolescents (74) and Polish adolescents (34) found that adolescent boys did not differ significantly than the adolescent girls, which are contrary to my study findings. Earlier research has also found a weak and modest relationship between demographic variables such as gender and life satisfaction (98, 99). These study outcomes reflect that gender has little or no influence on adolescents' life satisfaction. However, such inconsistent findings may need to be revised. Past studies such as on mid-Norwegians (29) and Scottish adolescents (5) found gender differences in life satisfaction, which may be explained by the differing changes in physical, psychological, social, and hormonal characteristics between boys and girls during adolescence (100). Life satisfaction, a part of subjective well-being (SWB), vastly depends on individual perceptions about life and how they rate their lives (12, 98), and hence the boys' and girls' perception of life varies. Also, gender differences in cross-national life satisfaction results may be attributed to cultural differences, impacting adolescents' thoughts and reporting on the quality of life (12).

4.3 Strengths of this study

The primary strength of this study is a large number of participants in the annual youth survey Ungdata across Norway, with an overall response rate of 75% in 2021 (101), illustrating a greater representation of the study population. This representation further increases the generalizability of the findings and reduces the selection bias in this study. Secondly, the anonymous participation of the respondents in this study resulted in unbiased answers from the respondents, reducing the possibility of a response bias. Such responses may have yielded an actual identification of general life satisfaction predictors among adolescents. Identifying the

factors influencing life satisfaction may provide a base for health promoters and decision-makers to enhance the quality of life of adolescents further. Thirdly, this study is based on online data collection during school hours, which minimizes the observer bias and the probable influence of the researchers on the respondents. Fourthly, the Cantril Scale, derived from the HBSC study, is considered a reliable and valid scale to measure emotional well-being, subjective health, and perceived health among adolescents (5). Finally, the gender-stratified results on the predictors of life satisfaction in this study facilitate prioritizing the respective life-promoting interventions among boys and girls.

4.4 Limitations of this study

The limitation of this study includes the cross-sectional study design. The nature of the data collected at a single point in time in this study design may have influenced adolescents' responses depending on the circumstance they were in or their current mood. For example, 2021 was the post-pandemic period, or when COVID-19-related restrictions were gradually lifted in Norway (102). Thus, the Cantril Scale and the answers to subjective questions may have been scored compared to the 2020 pandemic rather than the general life events they had before COVID-19. Adolescents are thus likely to give optimistic answers to quality-of-life questions in 2021 compared to the life experiences in the pandemic year of 2020. Additionally, this study cannot infer that these predictors cause adolescent life satisfaction as the cause-and-effect relationship is difficult to ascertain in this study design. The causality pathway between life satisfaction and the predictors (i.e., predictors influencing life satisfaction vs. life satisfaction influencing the predictors) is challenging to determine in cross-sectional studies. Hence, the findings of this study should be considered preliminary for further longitudinal studies. Another limitation of this study may be the misinterpretation of the subjective questions that may have influenced their answers, causing the non-differential misclassification bias. Besides this, previous studies suggested that factors including the prevalence of depressive symptoms (22) and satisfaction with body and appearance (93, 94) affected life satisfaction among adolescents. Influences of such factors could not be addressed in this study due to the high percentage of missing data, due to which better predictors of adolescents' life satisfaction may have been missed out.

CHAPTER V: CONCLUSION

The purpose of this study was to investigate the influential factors on the life satisfaction of Norwegian adolescents from the national youth data "Ungdata" for the year 2021. Norwegian adolescents were found to have an average level of life satisfaction with a mean CS score of 7 on a scale of 0-10, a measure adapted from an HBSC study. Norwegian boys had a higher life satisfaction (mean Cantril Scale score of 7.52) than Norwegian girls (mean Cantril Scale score of 6.71), and gender differences were found among the predictors of life satisfaction. The investigated predictors of life satisfaction included a wide range of variables such as gender, education level, family wealth, satisfaction with parents, friends, school and living environment, engagement in physical activity, and bullying, all of which showed a statistically significant association with life satisfaction. There was no association found between life satisfaction and engagement in unorganized training. The loving parent and school dissatisfaction were among the essential factors that positively and negatively influenced Norwegian adolescents' life satisfaction.

However, further studies could examine the reasons behind these associations found by the current research with life satisfaction. Such information can be used to maintain well-being and health indicators or improve the adolescent population's quality of life in other countries. The longitudinal studies could also conduct a trend analysis of Norwegian adolescents' life satisfaction over the years. The cause of gender-specific disparities and adolescent life satisfaction could be the subject of future research.

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APPENDIX

Table 5: Descriptive statistics of the independent variables under the five domains of BMSLSS based on the CS score and the levels of life satisfaction of Norwegian adolescents.

Independent Variables	Total %	Cantril Score		Cantril Level (N=136 498)			Missing %
		Mean	S.E.	Low life N=42 993	Average life N=61 469	High life N=32 036	
<i>Living Environment</i>							
Good and Safe	78.2%	7.33	0.005	26.4%	47.6%	26.0%	3.7%
Neither good nor bad	14.1%	6.18	0.015	51.4%	37.3%	11.3%	
Bad and unsafe	4.1%	5.44	0.035	61.5%	27.0%	11.5%	
<i>Relationship with parents</i>							
<i>Company when sad, unwell, or having family meals</i>							
Yes	73.2%	7.43	0.006	24.4%	48.4%	27.3%	4.1%
No	7.3%	5.51	0.024	62.5%	27.7%	9.8%	
Do not know	15.4%	6.19	0.014	51.0%	38.7%	10.3%	
<i>Time spent with parents in everyday life</i>							
Barely	9.2%	5.74	0.021	57.0%	32.6%	10.4%	0.9%
Occasionally	28.1%	6.75	0.009	38.0%	46.0%	16.0%	
Usually	61.7%	7.44	0.006	24.6%	46.6%	28.8%	
<i>Felt loved by parents/ guardians</i>							
Barely	4.9%	4.45	0.029	79.4%	17.1%	3.5%	1.22%
Occasionally	9.4%	5.79	0.017	59.7%	35.2%	5.1%	
Usually	84.5%	7.38	0.005	25.5%	47.9%	26.6%	
<i>Arguments in the family</i>							
Yes	15%	6.21	0.015	50.2%	36.5%	13.4%	2.7%
No	82.4%	7.25	0.006	28.0%	46.8%	25.2%	
<i>Relationship with friends</i>							
<i>Have a close and trustworthy friend</i>							
Yes	86.9%	7.22	0.005	29.0%	46.6%	24.5%	1.8%

No	11.3%	6.08	0.019	51.4%	34.2%	14.4%	
<i>Fit well with classmates</i>							
Yes	41.8%	7.89	0.007	15.6%	47.5%	37.0%	2.5%
Neutral	50.4%	6.67	0.007	40.1%	46.0%	13.9 %	
No	5.3%	4.69	0.029	75.0%	19.1%	6.0%	
<i>School Environment</i>							
<i>Enjoy school</i>							
Yes	48.7%	7.87	0.006	15.5%	48.7%	35.9%	1.7%
Neutral	46%	6.47	0.007	44.7%	43.8%	11.6%	
No	3.7%	4.40	0.037	77.1%	15.5%	7.3%	
<i>Bored at school</i>							
Yes	28%	6.48	0.011	44.4%	38.9 %	16.7%	2.2%
Neutral	64.1%	7.30	0.006	26.6%	48.8%	24.5%	
No	5.8%	7.64	0.027	22.3%	34.9%	42.8%	
<i>Care from teachers</i>							
Yes	36.7%	7.69	0.008	20.3%	45.2%	34.5%	2.3%
Neutral	57.6%	6.80	0.007	36.8%	46.3%	16.9%	
No	3.5%	5.44	0.042	59.1%	26.4%	14.5%	
<i>Dread going to school</i>							
Yes	7.1%	5.60	0.027	60.8%	24.3%	15.0%	2.2%
Neutral	46.7%	6.67	0.007	40.4%	45.3%	14.3%	
No	44%	7.77	0.007	17.2%	48.5%	34.4%	
<i>Stress by schoolwork</i>							
Yes	51.5%	6.53	0.008	42.7%	43.0%	14.4%	1.5%
Occasionally	28.4%	7.53	0.008	21.6%	50.5%	28.0%	
No	18.6%	7.95	0.011	15.4%	43.3%	41.3%	
<i>Satisfaction with Self</i>							
<i>Opinions about own body weight</i>							
Thin	0%	5.2	1.393	60.0%	40.0%	0.0%	
Just right	0.3%	7.49	0.096	23.1%	46.4%	30.5%	99.6%
Fat	0.1%	6.29	0.179	45.0%	37.6%	17.4%	
<i>Satisfied with their body</i>							
Yes	1.4%	7.86	0.039	15.6%	46.1%	38.3%	96.9%

No	1.7%	6.54	0.041	41.9%	44.8%	13.3%	
Satisfied with their appearance							
Yes	1.4%	7.99	0.034	13.0%	48.2%	38.8%	96.9%
No	1.7%	6.43	0.043	44.3%	43.0%	12.7%	

Note: From χ^2 test, p -value <0.001 i.e. statistically significant at 0.05 level for all the above variables.

Table 6: Descriptive statistics of the independent variables based on the CS score and the levels of life satisfaction of Norwegian adolescents.

Independent Variables	Total %	Cantril Score		Cantril Level (N=136 498)			Missing %
		Mean	S.E.	Low life N=42 993	Average life N=61 469	High life N=32 036	
Physical activity							
Frequency of engagement in physical activity (PA)							
Never	2.1%	6.25	0.054	47.4%	27.3%	25.4%	5%
Rarely active	13.8%	6.56	0.015	43.6%	39%	17.5%	
Lightly active	25.4%	6.96	0.010	34.0%	45.6%	20.3%	
Moderately- Vigorously active	53.7%	7.31	0.007	26.6%	47.5%	25.9%	
Engagement in organized training (dance, martial arts or similar)							
Never	73.3%	7.09	0.006	31.1%	45.8%	23.1%	8.2%
Rarely active	6.5%	6.99	0.021	34.0%	44.0%	22.0%	
Lightly active	6.8%	7.04	0.019	32.2%	45.8%	22.0%	
Moderately- Vigorously active	5.2%	7.09	0.025	32.2%	42.0%	25.8%	
Engagement in unorganized training (running, swimming, cycling, walking)							
Never	20.1%	6.87	0.013	35.8%	42.4%	21.7%	7.2%
Rarely active	27.2%	7.04	0.009	32.2%	46.6%	21.2%	
Lightly active	24%	7.20	0.009	28.6%	48.0%	23.5%	

Moderately- Vigorously active	21.5%	7.21	0.011	29.5%	44.1%	26.4%	
Bullying							
Being bullied, threatened, and ostracized by others							
Often	4.4%	6.21	0.055	58.7%	30.2%	11.1%	2.8%
Sometimes	5.2%	6.63	0.041	53.8%	35.8%	10.5%	
Rarely	21.9%	6.91	0.013	39.6%	45.7%	14.7%	
Never	65.7%	7.16	0.006	25.1%	46.8%	28.1%	
Being bullied, threatened, or banned online							
Often	2.4 %	5.59	0.033	65.3%	24.0%	10.7%	2.4%
Sometimes	3.3%	6.04	0.025	60.5%	29.5%	10%	
Rarely	16.3%	6.68	0.011	44.5%	42.8%	12.7%	
Never	75.7%	7.41	0.006	26.3%	47.0%	26.7%	
Depressive symptoms							
Not mentally distressed (<1.85)	6.0%	8.05	0.015	10.8%	51.3%	37.9%	89.3%
Mentally distressed (>1.85)	4.6%	5.93	0.025	55.9%	36.8%	7.3%	

Note: p-value calculated from (χ^2) is 0.000 for all the above variables (<0.05).

