LUND UNIVERSITY
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Exploring Young Adults' Relationship to Forest Visits in Sweden: A Grounded Theory Study with Implications for Policy Planning.

Swedish young adults' experiences and perceptions on forest visits from a mental health perspective, and suggestions for policy measures to increase interest in forest visits in their age group

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Abstract

Background: Mental illness is a significant public health issue among young adults in Sweden, who are also spending less time in nature despite its proven positive health effects. However, there is limited research on young adults' relationship with forest visits from a mental health perspective.

Aim and Research questions: This study aimed to explore young adults' experiences and perceptions of forest visits from a mental health perspective, and understand what aspects play a role in shaping their interest in forest visits. Furthermore, the aim was to provide an explanatory foundation based on the findings, for the design of preventive methods against mental illness through forest visits.

Method: The study used qualitative constructivist Grounded Theory methodology as described by K. Charmaz and collected data from 10 focus group discussions with a total of 58 participants aged 16-25. Initial sampling focusing on sociodemographic factors was applied to achieve maximum variation in the sample. Additionally, theoretical sampling based on family and cultural background was further utilized throughout the analysis to achieve theoretical saturation.

Results: The analysis found one core category and six themes that emerged from the data. Furthermore, the analysis found two conditional dimensions that were found to shape young adults' interest and preferred interventions in connection with forest visits. An explanatory model was constructed as a final product of the analysis, where a reconstruction of the participants' suggestions for interventions were plotted in relation to the two conditional dimensions. The core category revealed that young adults like the idea of being in the forest, but they rarely visit it. The six emerging themes aimed to support the core category and explain why this is the case. The two conditional dimensions to which suggested policy interventions were related were: the level of perceived familiarity with forests and the preferred degree of independence during forest visits.

Conclusion: The study identifies emotional and material barriers that prevent young adults from visiting forests, despite experiencing positive health effects from doing so. The proposed measures to increase forest visits in this age group are presented through a two-dimensional explanatory model, which can be adapted to local contexts based on the level of familiarity and preferred independence of the target population. Variations in family and cultural background seemed to be connected to the conditional dimensions, in turn influencing the incentive for forest visits among young adults and thus the type of policy intervention preferred. In conclusion, this study provides new insights into Swedish young adults' relationship with forest visits from a mental health perspective. The findings can serve as a theoretical foundation for future research and as a basis for preventive public health policies to address stress-related mental illness among young adults in Sweden.

Table of content

1. Introduction

This study focuses on young adults' relationship to forest and forest visits. In my judgement, there are several research fields that are relevant to this study. Initially, the mental health of young adults in Sweden will be discussed, both presently and historically. Following this, research on the effects of forests and nature on health will be introduced. Finally, I will highlight the less explored field of research on Swedes' relationship to forests and nature. The presentation of these fields clarifies what has been done in research so far. Additionally, I will identify the knowledge gap and the ways in which this study can contribute to new knowledge and improved public health.

1.1 Mental illness among young adults in Sweden

In Sweden, there is a growing problem of mental illness, especially among teenagers and young adults (YAs) (Ahrén & Lager, 2012; Hagquist, 2011; Lager, 2009; Stefansson, 2006). Mental disorders and syndromes account for a significant proportion of the disease burden among children and young people in Sweden. The latest study on global disease burden shows that depression, anxiety disorders, and self-harm are some of the conditions that cause the greatest disease burden among young men and women aged 15-24 years in Sweden (Institute for Health Metrics and Evaluation, 2019). Psychotropic medication, particularly antidepressant drugs, is increasingly prescribed to young adults, with an increasing proportion of diagnosed depression, anxiety disorders, and prescribed antidepressant drugs among all young adults, but particularly among young girls aged 10-17 years (Public Health Agency of Sweden, 2022).

The use of stress as an indicator of self-rated ill-health has become more common in recent years (Lindblad & Lindgren, 2009). For instance, statistics from the Swedish National Agency for Education (Swedish National Agency for Education, 2001) reveal that 31% of upper secondary school students reported feeling stressed often or always in 1997, while in 2022, statistics from the national health survey by the PHA (2022) show that 36.9% of women and 17.1% of men aged 16-29 reported feeling stressed. In Sweden, as well as in many other Western societies, there has been a growing concern about the increased prevalence of mental illness among children and young people (Bremberg, 2013; Collishaw et al., 2004). According to a report by the PHA (Public Health Agency of Sweden, 2018), several presumed reasons for this trend include increased stress and pressure from school, societal changes, the use of mobile phones, and a more sedentary, digitally based lifestyle. However, research suggest that the increased reporting of mental illness among young people may be due to a more open climate

for discussing mental illness (Jorm et al., 2017). Another possible explanation for the increase in mental illness is the individualizing society, which can lead to stress from unattainable expectations and a belief that social problems and failures are caused by individual shortcomings (Bauman, 2001; Elliot & Lemert, 2006). Furthermore, a report from the Swedish PHA has been able to demonstrate differences in mental health in relation to socio-economic conditions, where children who report that they do not have good financial conditions are more likely to report mental and psychosomatic problems than other children and young people (Public Health Agency of Sweden, 2019a). A survey conducted by Linnaeus University (Novus & Linnaeus University, 2016) found that young people aged 18-25 felt pressured to live up to an ideal image, with 8 out of 10 of those who believed in an ideal image experiencing stress or pressure to achieve it. Additionally, 42% of young people aged 18-25 stated that they worried about their own future. A survey on the website ungdomar.se found that, regardless of age, the most challenging perceived accomplishment for 13-24-year-olds to achieve in the future was being happy, followed by getting a permanent job (Mentor & Ungdomar.se, 2016).

Depression and anxiety disorders are the primary contributors to the increased prevalence of mental illness among children and youth, with substance abuse and addiction also on the rise (National Board of Health and Welfare, 2020). The Swedish National Board of Health and Welfare predicts that the increase in mental illness among this population will continue to grow, as new cases of depression and anxiety disorders are diagnosed and become part of a larger population of affected youth with long-term health needs. The Board further notes that the increasing prevalence of mental illness among children and young adults may result in a larger group of individuals who struggle to establish themselves in the job market and adult life, and who may also face additional psychological burdens, such as the stress of being unemployed (National Board of Health and Welfare, 2020). Researchers have presented this trend as a global public health challenge that should be prioritized and addressed in research contexts (Kleinman, 2009; Kolip et al., 1999; McGorry et al., 2022; Währborg, 2009;). Recent research has further suggested that the number of young adults in Europe with mental health problems has doubled since the COVID-19 pandemic (OECD, 2021), and that symptoms of depression or anxiety are between 30% to 80% more likely among young adults compared to adults in this region (OECD, 2021; Eurofound, 2021). According to the "Health on equal terms" survey by the Public Health Agency of Sweden (PHA), there has been a significant increase in the percentage of women and men in the age group 16 − 29 years who have reported mild or severe symptoms of anxiety, worry, or unease over time, with both mild and severe symptoms

being reported more often by young women than young men (Public Health Agency of Sweden, 2022). As visualized in figure 1, the biggest changes occurred in the last four years, which can be partly explained by the COVID-19 pandemic, followed by Russia's invasion of Ukraine and their effects on society and future outlook.

(Insert figure 1)

1.2 Forest and health

Numerous studies have shown that spending time in natural environments, including forests, has positive effects on human health (Uddenberg, 1995; Andersson & Cocq, 2014). However, the terms used to describe these environments are often used interchangeably without a clear standard for terminology. In this study, the term forest is used as an emic category. An emic category is a concept or term that is defined and understood from within the culture or group being studied, rather than imposed from an external perspective (Mostowlansky & Rota, 2020). In this study, forests are defined from the perspective of the group of people being studied; young adults residing in Sweden.

Research on the positive health effects of nature can be divided into two categories: strictly chemical-medicinal effects and psychological effects. Studies have found that spending time in forests can lead to a decrease in blood pressure and strengthened immune function (Ideno et al., 2017; Li et al., 2008). Proximity to green spaces has also been linked to a longer life expectancy and a lower risk of cardiovascular disease (Bowler et al., 2010; Tsunetsugu et al., 2007). Exposure to natural environments has also been found to reduce levels of the stress hormone cortisol and increase self-reported well-being (Hunter et al., 2019; White et al., 2019). The psychological benefits of exposure to nature are particularly strong, including reductions in stress and improvements in mental health (Kuo, 2018; Adevi & Mårtensson, 2013; Eriksson et al., 2011; Lee et al., 2011; Nordh et al., 2009; Pálsdóttir et al., 2014; Sonntag-Öström et al., 2015; Sonntag-Öström et al., 2014; Ulrich et al., 1991; Kuo, 2015; Währborg et al., 2014). Even exposure to nature through films and images has been found to have a calming effect on people (Laumann et al., 2001; van den Berg et al., 2003). These benefits have been observed in, among others, individuals with burnout syndrome, post-traumatic stress disorder or depression, attention deficit hyperactivity disorder, and cancer patients (Kaplan & Kaplan, 1989; Kellert & Wilson, 1993; Ahmadi & Ahmadi, 2015).

Researchers have presented chemical-medicinal and psychological explanations for the beneficial effects of nature on human health. One chemical-medicinal explanation is the

release of phytoncides, odorants released by plants, which may have a calming effect on humans (Park et al., 2009; Craig et al., 2016). One psychological explanation is the Attention Restoration Theory, which suggests that spending time in nature encourages a restorative, energy-giving type of attention (Kaplan & Kaplan, 1989; Kaplan, 1995). Edward O. Wilson's theory of Biophilia suggests that humans have a natural inclination towards nature that has been shaped by evolution (Wilson, 1984). This theory is supported by research showing that people prefer open landscapes with a variety of species and a view of water (Ulrich, 1983). Wilson further argued that people appreciate the sensory impressions of nature because of their historical dependency and inclination towards the richness and abundance of nature, which have promoted human survival in nature.

1.3 Swedes' relationship to forests and nature

The cultural aspect is important but often overlooked in understanding the relationship between humans and nature. Thurfjell argues in his book "Granskogsfolk" that Swedes' strong affinity for nature is partly due to the benevolent Scandinavian nature that invites opportunities for people to psychologically interact with it (Thurfjell, 2020). This relationship with nature largely depends on what nature can invite in terms of behaviour, which Gibson terms as "affordance". From an existential perspective, nature can invite humans to a place that evokes well-being and tranquillity for humans, if we ourselves are consciously or unconsciously attuned to this as part of nature's affordance (Gibson, 1977; 1979). The concept of predictive coding in neuropsychology follows the same reasoning, where our emotions and experiences largely depend on what the brain expects from the situation (DeLancey, 2004). Expectations are believed to have a significant impact on mental health conditions such as anxiety, stress, worry, or pain (Miller et. al., 2009). Furthermore, Thurfjell suggests that Swedes' experience of the forest as calming, and health-promoting is largely due to the culturally coloured image of the forest as a calming and beautiful place in Sweden's cultural history (Thurfjell, 2020).

Swedish citizens who have been shaped for generations by the culture that reveres the beautiful Nordic landscape can be considered to have an overall positive expectation of and thus a health-promoting effect of spending time in the forest and nature. However, research has shown that Swedes' relationship to the forest and forest visits differs significantly across subgroups of the population, such as cultural background, age, and socio-economic background. For example, Swedish immigrants feel more afraid of forest visits than native Swedes, especially concerning being alone in the forest. Blomqvist (2003) discusses some potential reasons behind this behaviour to be: fear of becoming a victim of crime in the forest,

negative feelings of boredom when being in the forest alone, negative past experiences in nature settings from home country, and lack of knowledge about nature and relevant citizen rights in Sweden..People living in rural areas engage in outdoor activities in forests and nature to a greater extent than urban dwellers (Statistics Sweden, 2021). Young people aged 18-20 belong to the group that spends the least time in the forest (Statistics Sweden, 2021), and in the age group 16-24 years, only 15-20% report visiting the forest or nature once a week according to a PHA survey (Public Health Agency of Sweden, 2019b). This is, however, based on the questioning of whether one has "visited forest or nature to experience nature, pick mushroom or berries". Here, PHA problematizes that there might be a generational risk that the younger population is not reached correctly due to the formulation of the question. The share of young adults who visited forests at least once a week increased to 40% during the COVID-19 pandemic (Statistics Sweden, 2021), but there are currently no public statistics on outdoor habits in different age groups after the pandemic. Outdoor activities are more common among 15-16-year-olds with parents from the upper- and middle class than among those with parents from the working class, which shows that young adults' outdoor activities increase in frequency and variety the better off their families are financially, and vice versa (Backman, 2003). Overall, there are many cultural and social determinants for Swedes' relationship to and health effects of forest visits, including socio-economic background, age, cultural heritage, and urban/rural residence.

1.4 Research gap and public health relevance

Young adults in Sweden are increasingly experiencing mental illness and are at the same time spending the least amount of time in forests and nature (Public Health Agency of Sweden, 2019b). A lack of studies on young adults' relationship with forests has been noted, with only one study conducted, using a forest management perspective (Kronholm & Staal Wästerlund, 2017). This study will be the first to explore Swedish young adults' relationship with forests from a public health perspective, focusing on mental health. The high proportion of young adults suffering from mental illness in Sweden poses significant challenges to public health and society, with the World Health Organization recognizing the severity of the problem as a global public health challenge (World Health Organization, 2005). Nevertheless, forests and nature provide an easily accessible opportunity for stress relief and mental recovery, and forest visits could be used preventively against stress-related illness for this age group. By examining young adults' relationship to forest visits from a mental health perspective, the study can contribute to a deeper understanding of young adults' experiences and perceptions of the forest.

2. Aim and Research Questions

The aim of this study is thus to investigate the significance of forest visits for the mental health and well-being of young adults (aged 16-25) and their experiences and perceptions about the forest and forest visits. Furthermore, the study aims to construct an explanatory model through the exploration of potential conditional dimensions that affect young adults' interest in forest visits, in relation to suggested policy interventions. The aim of the model is to serve as a foundation for the design of preventive methods against mental illness through forest visits. Thus, the study aims to answer the following two main research questions:

1. **What are young adults' experiences and perceptions of forest visits from a mental health perspective?**
2. **What aspects shape young adults' incentive for forest visits, and how can they be addressed and related to interventions to increase interest in forest visits?**

By answering these main questions, the study aims to explore young adults' perspectives and interpretations of their experiences, and how these perspectives are shaped by broader contextual, social, and cultural factors. The following sub-questions guide the process:

- *What are young adults' attitudes towards and ideas about the forest?*
- *What experience do young adults have of being in the forest?*
- *How do young adults feel that their health is affected by being in the forest?*
- *What do young adults experience as barriers to being in the forest?*
- *What ideas and suggestions do young adults have for public health policies to increase the group's interest in forest visits?*

According to Dahlgren et al. (2019) in the book "Qualitative Methodology for International Public Health," the aim of grounded theory is to begin with data from real-world contexts and use it to develop an abstract understanding and explanation of the phenomenon under investigation. This involves collecting data to form a substantive case, which is then transcended through conceptualization and ultimately results in the construction of a formal theory. The use of sub-questions guides the data collection process and analysis, ensuring that the resulting theory is nuanced and comprehensive.

3. Methods

3.1 Study design

The present study aims to explore individuals' experiences, attitudes, perceptions, thoughts, and personal suggestions, and thus, a qualitative methodology is deemed most appropriate (Dahlgren et al., 2019). Moreover, the population under investigation is vast and diverse, necessitating the need to adjust recruitment procedures continually to achieve a realistic representation of the sample. The current dearth of theories on the relationship between young adults and forests/forest visits facilitates the use of an unpredictable and emergent methodology. These considerations align with the principles of constructivist grounded theory, as posited by Kathy Charmaz (2006). Charmaz asserts that Grounded Theory (GT) offers a robust approach to examining qualitative data since it allows researchers to construct theories based on the data rather than preconceived notions or theories (Charmaz, 2006). The study adopts a constructivist standpoint, where theories are constructed by analysing how participants interpret their subjective reality and role in the phenomenon during the interview process, as well as how contextual aspects shape the findings. The results are therefore grounded in the participants' subjective reality (Charmaz, 2006). Despite the project's relatively short timeline, GT was deemed appropriate, notwithstanding that this methodology is typically deprioritized in shorter projects due to impossibilities to reach theoretical saturation. However, a pilot study that primarily studied young adults with a Swedish cultural background demonstrated a homogeneous interest in and experience of forest visits, which prompted the need for and the possibility of theoretical sampling to further explore emerging conditional aspects in relation to variations in cultural background. Therefore, theoretical sampling focused on young adults with various foreign cultural background to approach theoretical saturation. To obtain data, focus group discussions (FGD) were deemed appropriate, which will be further discussed under the heading of “Data collection”.

3.2 Setting

The study was conducted with a focus on two cities in southern Sweden and the rural areas in between. One city is medium sized with high access to urban forests and nature, while the other city is a metropolitan area with lower access to urban forests and nature. One FGD was conducted with young adults living in a third, larger city. The setting was deemed representative of a larger Swedish population because the cities differ significantly in terms of access to urban green spaces and are also subject to different municipal and regional governance.

3.3 Sampling

This study focused on young adults between the ages of 16 and 25 in Sweden, with an upper age limit extension to 25 for logistical reasons. Inclusion criteria were thus individuals aged 16-25, residing in Sweden, and proficient in Swedish. The study followed a grounded theory approach adopting both initial and theoretical sampling, meaning participants were recruited initially with the goal of maximum variation, and thereafter concurrently with data collection and analysis to saturate and achieve variation within the emerging themes, rather than using predetermined recruitment criteria or randomization (Charmaz, 2006; Dahlgren et al., 2019). Physical FGDs were deemed most appropriate, and the researcher initially used personal contacts to reach out to groups that were convenient to access. Participants were thereafter initially sampled based on sociodemographic factors in order to achieve maximum variation in terms of gender, age, urban/rural residence, and college preparatory/vocational preparation programs, and recruited through high schools or folk high schools with varying geographical locations. During the analysis, the aspect of variations in terms of foreign cultural background proved relevant to fully explore conditional dimensions that seemed to influence young adults' attitudes towards and interest in forest visits, and theoretical sampling was used to delve into and find variation within these dimensions. Three aspects were considered when sampling on foreign cultural background. A participant was considered to have a foreign cultural background if the participant was born abroad. Furthermore, participants who considered themselves not belonging to a Swedish cultural background, or who perceived their upbringing or families as non-Swedish, were also considered to have a foreign cultural background. A demographic overview of the participants' characteristics collected through an anonymous survey is presented in the results section (Figure 3), and an overview of the composition of characteristics within each FDG, including perceived cultural background, is presented in Table 2. During the recruitment process, participants were orally informed about the study. Upon arriving in the room for the group discussion, participants were also provided with written information before giving their written consent to participate. Compensation in the form of home-baked treats and candy was offered to participants.

The composition of the group was a factor to consider when sampling for the FGDs, with familiarity between participants considered appropriate to require less time to build trust within the group. A disadvantage of this strategy can be the risk of over disclosure, and that participants do not explain themselves in detail because they feel it unnecessary (Hennink, 2014). However, forest visits were considered an unusual topic of conversation in the age group,

and the young adults therefore needed to explain themselves thoroughly anyway. Participants from the same school class were sampled to achieve homogeneity, which was desirable to ensure that everyone would feel confident to speak without barriers.

3.4 Data collection

As stated earlier, FGDs were considered the most suitable method for data collection. This type of interview is capable of identifying a wider range of opinions and experiences of a phenomenon within a specific group (Hennink, 2014), making it ideal for investigating experiences, opinions, and norm systems (Dahlgren et al., 2019). The number of participants in the FGDs was planned in accordance with widely accepted guidelines, with a range of 6-8 people being considered sufficiently small for everyone to have a chance to speak, but sufficiently large to achieve a group-level discussion (Hennink, 2014). However, due to the unavoidable element of unpredictability, group sizes varied between 5 and 9 people. The FGDs took place at an agreed-upon location near where the participants were recruited. Generally, the FGDs took place in a group room or small classroom in the participants' school building, which meant that the environment was highly familiar and presumably safe for the participants. The location of each group interview, as well as the fact that the discussions usually took place during class time, eliminated potential recruitment barriers such as transportation and time constraints.

Data were collected from December 2022 to March 2023 through 10 FGDs. After obtaining written consent from all participants, they were given an anonymous demographic questionnaire to complete, consisting of multiple-choice questions about age, perceived gender, upbringing environment, current rural or urban residence, highest education completed, and current occupation (see Appendix 1 for the questionnaire and Figure 3 under the heading of “Results” for the summary of the questionnaire results). The questionnaire was used to guide the initial sampling in order to achieve maximum variation. The participants were thereafter informed about the importance of mutual respect for each other's thoughts and feelings during and after the discussion. Participants were further informed that they would be recorded on two separate devices, and about their rights to withdraw their consent and discontinue their participation at any time, how the data would be presented in the study, and how the data would be stored until then. The discussion was guided by an open-ended interview guide divided into three different phases according to the interview guide structure presented in the book "Designing and conducting focus group research" by Monique Hennink (2014). According to Hennink, the interview guide should be designed according to an hourglass model, with broader

introductory questions at the beginning to create rapport among participants, specific questions in the middle that encourage discussion and aim to answer the research question, and again, broad concluding questions with summarizing elements and room for other thoughts. Initially, participants where thus asked questions such as “When are you in the forest?” and “What are you doing there?” followed by questions such as “How are you feeling when in the forest?” and “What do you think other people your age think of the forest?”. See Figure 2 for a more detailed review of the interview guide's themes according to Hennink's hourglass model, and Appendix 2 for the entire interview guide translated to English.

(Insert figure 2)

The final part of the key topics and specific questions phase began with the question, "What suggestions or ideas do you have for measures to increase interest in forest visits among your age group?" The construction of ideas and proposals occurred in the forming of a mind map that all participants could view. Incorporating interactive mind-mapping during the interview session is a modification of Charmaz's clustering technique, which shares some similarities with conceptual or situational mapping in grounded theory. As noted in Charmaz's book (2006), mind-mapping permits a non-linear and randomized way of thinking and reasoning, which enhances and guides creativity and imagination. In this study, interactive mind-mapping serves as a tool for constructing knowledge among the participants during the group discussion since some level of interpretation is necessary for them to organize or reflect on the emerged "categories" in the form of bubbles on the map. Therefore, incorporating interactive mind-mapping during the discussion is a modification of Charmaz's grounded theory methodology and was deemed capable of providing guidance for the conceptualization process and contributing to the formation of a grounded theory.

3.5 Analytic approach

Following Charmaz's book "Constructing Grounded Theory," (2006), the ten FGDs were transcribed verbatim. Initial line-by-line coding, suitable for detailed data about empirical processes and where the researcher needs to remain open to the data (Charmaz, 2006), was conducted using NVivo software to generate codes that were linked to the corresponding transcripts. Data from the demographic questionnaires were used to guide the initial sampling into reaching maximum variation. The resulting initial codes along with memo-writing constituted the foundation for theoretical sampling, focusing on cultural background to achieve variation and approach saturation of categories and dimensions. The entire transcript with all

stages of the FGD, including the mind map session, was coded the same way. Focused coding was initiated when the data was considered rich in terms of maximum variation. During focused coding, all codes were exported to an Excel sheet and clustered to form subcategories or categories. In accordance with the constructivist grounded theory analytical approach, the process involved clustering the generated codes into subcategories and categories, along with memo writing and comparison of transcripts, resulting in the identification of six emergent themes that formed the basis for one core category. Table 1 illustrates an example of the process from initial coding to forming the category "Experiencing a sense of freedom from forest visits", one part of the basis for the theme "Positive mental health benefits of forest stays, including improved mood, relaxation and stress relief".

(Insert table 1)

All subcategories, categories, themes, and the core category are visualised in Table 3 under the heading of Description of the Results, providing a comprehensive overview that guided the investigation of both research questions. As for the following stage of the analysis, theoretical coding was addressed to conceptualize how the focused codes and categories were interrelated (Charmaz, 2006), resulting in the construction of two conditional dimensions. During the analysis, particular attention was given to the aspect of cultural background. After the exploration of the codes through memo writing, theoretical sampling focusing on variations in terms of foreign cultural background was utilized to further explore and approach saturation within the conditional dimensions that seemed to affect and shape young adults' interest and experience of forest visits During theoretical sampling, codes from all additional transcripts were compared and contrasted to each other and earlier codes to approach theoretical saturation within the dimensions. (Charmaz, 2006). As a final product of the analysis, an explanatory model was constructed to visualize how different levels of the dimensions could be related to young adults' interest in forest visits. The interventions presented in the explanatory model are rooted in the suggestions voiced and constructed by the participants during the focus group discussions, but reconstructed based on the analysis to ensure that the final suggestions are linked to the findings but remain descriptive in character. The model can serve as a guide for planning and implementing forest visits targeted at young adults. The entire process, both data collection and analysis, was conducted in Swedish. The results were subsequently translated into English, and some grammatical corrections were made to the quotes presented in the results section.

3.6 Choice of terminology in the study: Outdoor recreation ("Friluftsliv") and forest visits.

In Sweden, outdoor recreation, "Friluftsliv", is an established concept, albeit one that is often disputed in terms of its definition (Backman, 2004). The official Swedish definition was established in a report commissioned by the Swedish Government in 1999, which defines outdoor recreation as *the act of spending time and engaging in physical activity outdoors to achieve a change of environment and a nature experience without the need for performance or competition* (Friluftsgruppen, 1999, p. 13, author's translation). In this study, the term "outdoor recreation" is avoided, and instead the term "forest visits" is used to avoid potential preconceptions that young adults may associate with "outdoor recreation", particularly in light of their encounters and experiences with the term in schools and preschools. This is done to open for a broader discussion about forest visits on a personal level.

3.7 Ethical considerations

The study was conducted in accordance with the guidelines of the Swedish Ethical Review Authority, which state that individuals over 15 years of age may participate in research without requiring consent from a caregiver (Swedish Ethical Review Authority, 2023). Participants in this study were provided with detailed, written information regarding their right to withdraw their consent at any time, as well as how their data would be handled, stored, presented, and deleted. They were also informed that the discussion would be conducted in a low-risk environment for discomfort. In addition, participants were asked to treat each other with respect during the conversation, and to understand that what was said during the group discussion would remain confidential. However, despite these measures, ethical considerations still needed to be addressed in accordance with the four ethical principles proposed by Dahlgren et al. (2019).

The principle of beneficence was considered to reflect upon the potential benefits of the study. The study was considered beneficial as it contributed indirectly to reflection on mental health and strategies for well-being. Furthermore, the study as a whole aimed to improve the mental health of young adults in Sweden. However, the incentive for participation primarily consisted of sweets and home-baked treats, which could be perceived as contradictory to the principle of beneficence given the unhealthy nature of the compensation. Nonetheless, it was deemed a necessary compromise to mitigate potential selection bias that may arise if only individuals with a strong interest in the topic opt to participate without any form of incentive.

The principle of non-maleficence was approached by ensuring that the discussion did not cause discomfort for the participants. The remaining two principles proposed by Dahlgren et al. were those of autonomy and justice. *The principle of autonomy* was addressed by ensuring that participants were aware of their rights with regard to confidentiality, autonomy, and privacy through their informed consent. Participants were recruited through authority figures, usually teachers, and informed that participation was entirely voluntary. The ethical aspect unique to FGDs was emphasized to prevent discussion afterward. *The principle of justice* aimed to ensure that all participants were treated fairly, that the study contributed to a foundation for a fair and equitable life for all, and that the research reached a representative sample of the population. A heterogeneous subset of the study population was allowed to speak to ensure that everyone's voices were heard. However, a representative sample of the population over 20 and not studying was missing. This group proved difficult to reach, but their participation is necessary to answer questions and contribute to increased mental health for the entire population in as comprehensive and just a way as possible.

4. Results

4.1 Characteristics of participants

A total of 58 participants were interviewed, split into ten groups. One group consisted of 20-25-year-olds from a large city in middle Sweden, one group had mixed ages from a folk high school outside a large city in southern Sweden, six groups were from high schools within a large city (one group from a college-preparatory aesthetic program and five groups from vocational preparatory programs). Additionally, two groups from vocational preparatory programs at a high school in a medium-sized city in southern Sweden were interviewed. The median age of the participants were 17,5 years, with a nearly equal distribution between women and men. The largest share of the population had grown up in a Swedish urban environment, and the largest proportion currently resided in an urban environment. Nine participants had grown up abroad. All participants defined themselves as students. A detailed description of the participants is presented in Figure 3. As a result of a recruitment miscommunication, a group discussion was conducted with participants of whom two were above the age of 25. These individuals were asked to provide responses based on their “younger selves”, but any unique contributions made by them in the discussion that were not echoed by other participants were deemed non-representative and excluded from the data analysis.

(Insert figure 3)

In accordance with the Grounded Theory methodology, the results are presented below using quotations to demonstrate that the researcher's interpretation is grounded in the data (Charmaz, 2006). Each quotation with a line break is associated with its respective FGD. Table 2 presents a comprehensive list of all focus groups along with their demographic characteristics.

(Insert table 2)

4.2 Description of the results

The generated codes were clustered into subcategories and categories, from which six themes emerged, forming the basis for one core category: **young adults like the idea of being in the forest, but are rarely there.** Please refer to Table 3 for an overview of all subcategories, categories, and themes, which served as the foundation for addressing both research questions. Through the analysis of the entire data and after theoretical sampling, two conditional dimensions, namely **perceived familiarity**, and **preferred independence** in relation to forest visits, emerged as crucial for the final level of the analysis. These dimensions were constructed to explain the findings through an explanatory model; depending on the level of either preferred independence or perceived familiarity, there seemed to be different reasons behind level of interest, past experiences, and preferred interventions. The interventions presented in the explanatory model are rooted in the suggestions that arose from the participants during the focus group discussions and plotted in relation to the conditional dimensions. The results of the integrated analysis are presented below.

(Insert table 3)

4.3 Main findings

The emerging core category is ***young adults like the idea of being in the forest, but are rarely there.***

So, why is that? These findings aim to theorize the core category of young adults' attitudes towards spending time in the forest by exploring why they are attracted to this idea, as well as investigating the reasons for their infrequent forest visits. As visualised in Table 3, emerged categories were further analysed and clustered into six emerging themes, described in detail under the headings 4.2.1.1 to 4.2.1.6.

4.3.1 Positive mental health benefits from forest visits, including improved mood, relaxation, and stress relief

The young adult participants in the study associated numerous positive mental health benefits with forest visits. Reduced stress and anxiety were frequently mentioned, as well as improved mood and mental clarity. Participants often felt that the forest provided a sense of distance from many stressful factors and situations that are part of everyday life. *I often look for a real forest, (…) to get the real forest-experience, because I think it is healthy for me,* as one participant stated. They described a comfortable feeling of separation, which was amplified by sensory experiences from the forest, such as fresh air and the absence of urban noise: *one feels, (…) not so much society. It feels inside that everything is clean, fresh, new. It clears up one's soul.* Furthermore, young adults felt that the forest environment encouraged a different type of illogical feeling, *directionless, perhaps (…),* as one participant stated. *It's nice because one can't predict everything.* Another one argued in line with this:

> *"The nature is quite chaotic, and not logical, which becomes distracting, which means that one forgets about all musts and other things one otherwise thinks about, and become rapt in what one sees and starts to get ideas connected to what one sees [in the forest]."* (FGD8)

Sometimes, the forest created a feeling that the participants found difficult to describe in words, almost a magical feeling. This feeling was often linked to the sense that the forest is a natural place where we are meant to be. Additionally, young adults appreciated the lack of social norms and feelings of obligation associated with forest visits. *One doesn't need a to-do-list [in the forest], it is like an activity in itself,* as one participant recalled. Another participant stated that *I go there to breath, and let go (…) I am alone, I can do what I want, there are no rules and that makes me feel pretty free.* The association between forest and freedom was also based on forest visits being accessible to everyone under the Swedish concept of Allemansrätten (the right of public access to nature areas):

> *"Well, that it's free of charge, and available for all, not just something that a certain share of the population can use, I think that is nice that everyone has access to the forest and that everyone can be there no matter what they are like."* (FGD2)

Many participants reported using the forest as a place to contemplate, and think about *one's life, actually. What to improve, what to get rid of,* as one participant recalled. *One starts to think about the meaning of life, and such.* However, one participant noted that these individuals likely lack religion, as she herself, being religious, felt that she already had the answers to life's

mysteries and did not need to ponder them. The debate on when forest visits are most enjoyable never reached a consensus. Many felt that forest visits provided the most mental benefits during the summer and in good weather, but someone in almost every group disagreed, saying that forest visits were more enjoyable in inclement weather, or in all weather conditions.

4.3.2 Childhood experiences and family influence on building a positive relationship with forests

The reflection of one's association with the forest and nature was frequently founded on the manner in which the relationship was initiated. *I think that this amount of young people who like nature has to do with (…) families*, one participant stated, *or who have been allowed to stay in nature during their childhood.* For many young adults with limited experiences from forest visits with their family during childhood, the initial exposure to the forest and forest visits occurred during primary school, usually in connection with a sports event or lesson. It also has to do with family background, as articulated by a participant with a non-Swedish background:

> *"Compared to us who are not ethnic Swedish, it would have been crazy if my family had wanted to go visit the forest. (…) Swedish people are famous for their forest, it is obvious that they want to spend time there. (…) We do not have forests in the middle east."* (FGD4)

It was hence argued by young adults that Swedish populace is accustomed to the forest. The discussion frequently centred around the notion that a positive relationship with the forest is formed during childhood visits, and that a habit of spending time in the forest and its surroundings is essential to derive pleasure from it. *If you bring a kid to the forest, and he enjoys it,* one participant argued, *do you think he will stay inside and get stuck by the computer? He will prefer the forest.* Numerous respondents who had not spent much time in the forest during their early years disclosed that their introduction to the forest was through school excursions, which they often found to be enjoyable.

4.3.3 Socialization as important aspect of enjoyable forest stays, partly to avoid boredom

Young adults reported that socializing was a significant factor in their enjoyment of forest stays. They felt more comfortable and safer in the forest when they visited with friends or family. *When you go there alone, there are certain things one can do,* one participant stated, *but when you go there with friends or family, there are much more options of activities.* They also found the experience more enjoyable because they could share it with others, *perhaps one ends up in deeper conversations, (…) it gets more harmonic, and one listens more deeply to one another.* They appreciated meeting strangers in forests more than in cities and considered the setting

beneficial to making new friends. On the other hand, many believed that young adults do not spend much time in the forest because they have many other, more enjoyable options for activities, and that older people are in the forest because they do not have much else to do, or *they [old people] have more time, (…) but also because they prioritize their health*. The reason for wanting to be in the forest with others was often to avoid the risk of boredom. There seemed to be a connection between the level of appreciation of being alone in the forest, and the level of familiarity with forest visits. Some participants questioned *why would one want to be alone in the forest, what would one do there?* while many others preferred the forest precisely because they could avoid encountering *all the idiots out there*. The positive aspects of boredom also arose in many interviews, where one participant stated:

> *"Like I said, I think that it's part of the point, being bored in the forest, and I think one should be okay with that thought, because our brains are used with something happening constantly (…) and in the forest one can see the positive aspects with not having anything to do, but also no demands, one can just be present."* (FGD2)

Young people feel that they are dependent on their mobile phones, *it is like a prison, one could say,* one participant stated. Young adults often argued that the addiction to their phones and social media limits their opportunities for many important experiences, including forest visits.

4.3.4 Fear, irritation, and performance pressure in forests as potential barriers to positive mental health experiences

The common thread in all group discussions often began with positive superlatives about forest visits, but after a while, different negative aspects of the forest were brought up, such as fear of animals or being exposed to crime.. The forest is especially scary in the dark; *I would never walk into a forest alone at night-time*, one participant stated, *the forest is scary.* Irritation *from pesky insects* was also brought up as a negative aspect from forest visits. People who spend a lot of time in the forest had a harder time coming up with disadvantages of their visits, often citing human destruction like signs of civilization or littering as irritating factors. The experience was often that *one usually only hears the negative news about the forests,* perhaps news about rapes or dangerous animals, which was usually problematized through reflections that people do not have knowledge about the forest, that more information is needed, and that this is why people feel unsure when they are there. One aspect that was considered particularly relevant for this age group is the negative associations between forest visits and performance pressure. *It feels like if you're going out in the woods, you always have to do it properly*, one participant stated, *[I would prefer] that you might be able to go there and just chill*. Many young

adults feel that forest visits are often imposed by adults, either through family or school, and that this in itself is the reason for negative feelings about forest visits. Additionally, as phrased by one participant:

> *One likes to do things that are not good. One likes to eat junk food, to rest, to go out and party. Because to stay at home, go out and exercise or visiting the forest, it is like, I don't know, healthy, it is not fun.* (FGD5)

There is a notion that forest visits are still something that should be done to be good, and young adults prefer to do unhealthy things just to escape from all the pressure to perform and do good.

4.3.5 Material and physical barriers to accessing forests, including lack of time and energy

There were discussions about how the forest feels physically distant, and that public transportation to forest areas often feels complicated or time-consuming. People feel that having access to a car is usually necessary to get to a proper forest. *It feels like many forest sites require that [you have a car],* one participant recalled, *that there is a huge parking lot and then it's a reserve*. What was considered a "real" forest varied greatly among the participants; many prefer a forest that feels wild, without any buildings or other reminders of civilization. On the other hand, some controlled forest with facilities like toilets or maybe a nearby café were appreciated to some extent. One participant said that he *pretends that it is a forest, so it feels like a forest,* even if it might be a small grove of trees in the middle of a city. This was confirmed by other participants who believe that large parks are enough to get a sense of being in the forest. Other participants were more extreme and felt a greater need for untouched terrain, explore in the wilderness, and experience the feeling that the forest never ends to have an authentic forest experience. *When it is a forest that connects all cities or villages*, one participated argued, *then it is a real forest.* The complicated issue of getting to the forest often arose during the conversations. *I think it is such a project to get out in the forest*, one participant said, *you have to find a way to get there.* Many other young adults agree that forest visits, due to the feeling of remoteness, require a lot of planning and become too much of a project for it to happen, which in itself destroys the purpose of forest visits when finally getting there; *it becomes more counterproductive, you become more stressed by taking the public transport (…) and then you might just not do it.* In line with this, many young adults believe that if they have access to a forest near their home, it is much easier to spend time there and appreciate the forest. Young adults feel that they are lacking time, school takes up all their time on weekdays, and many prefer to party with friends on weekends. *But then, priorities too,* one participant argued, *I prefer to lay in the sofa after my work and, like, die, just sleep the entire day. I should go*

outdoors because I know that I, in fact, feel better then. On the other hand, the perceived laziness was considered a much-needed rest, and again, it was emphasized that forest visits risk becoming another stressful thing to do when it should only cause a feeling of relaxation and recovery. Furthermore, it was discussed that a potential barrier could be the limited access to equipment, *because it might be that young people don't get to try [forest activities],* one participant argued, *since they lack the right equipment.*

4.3.6 Acknowledging, but not agreeing, with general notion of forest visits considered weird

Some young adults stated that they experience a notion on group level of weirdness surrounding forest visits, that people of their age who spend time in forest are considered *lame or weird.* The ones stating this were always opposing the notion personally; *some people think that, but I don't agree,* as one participant stated. However, in some group interviews, the thought of spending time voluntarily in a forest setting evoked laughter or mocking between participants. As with many norms, what one says and what one acts on often differ and depend on setting, and it has been clear during the interviews that there are societal aspects concerning the phenomenon of forest visits in this age group, especially among the younger participants. However, one participant stated that she usually gets a positive picture of forest visits from social media, *during summer, when people are hiking or something, it looks really cosy.* Others argue that at this age, *people are very sensitive to what others think and believe,* and that their relationship with the forest largely depends on their friends' opinions. Every time the concept of the Scouts came up in discussions, the participants were positive about these groups and the people who engaged in them, even though they are rarely heard of: *they feel unreachable, like a cult,* one participant recalled. Other participants were not aware that the Scouts existed in Sweden. Some participants who shared positive experiences of *letting go and experiencing mother nature* sometimes excused themselves for being cliché, while some male participants expressed frustration about the apparent trend of using forest settings for contemplation: *One is in a completely different world than what is really the case (...) We would not have the same society, we would stop being able to see the problems in reality, I think.* This is in line with other comments about the perceived romanticization of the forest, with one participant arguing against another's thoughts that the forest is a forest because of the presence of wild animals by saying *I have squirrels outside my window, and I live on a courtyard [in the city].*

4.3.7 The conditional dimensions: preferred independence and perceived familiarity

During the analysis, two conditional dimensions emerged that seemed to influence young adults' interest in forest visits: the level of perceived familiarity with forest visits, and the level of preferred independence when visiting the forest. The conditional dimensions were constructed as scales, where young adults' experiences and opinions seemed to vary depending on the level (low/high) of perceived familiarity and preferred independence during forest visits. The dimensions further formed the two scales in a two-dimensional explanatory model where proposals for interventions to increase young adults' interest in forest stays were plotted, as visualized in Figure 4.. There seemed to be a connection between foreign cultural background and both low perceived familiarity and low preferred independence during forest visits. Similarly, young adults with a Swedish cultural background and/or native Swedish parents in general perceived themselves as more familiar and preferred more independence during forest visits. However, there were many examples of participants who did not fit into that explanation, such as a young woman whose foreign parents had taken the family out into the forest every week throughout her entire childhood, and participants with a Swedish cultural background who felt very unfamiliar with the forest and very reluctant to spend time there on their own.I Interventions initially constructed by the participants during the FGDs are reconstructed and plotted in relation to the conditional dimensions in the explanatory model, representing the final product of the analysis of all the collected data. Figure 4 strives to function as a guide to use when planning or initiating interventions to increase interest about forest visits among young adults in Sweden. Below, all suggestions are presented with reasoning on how each idea has been linked to the findings, starting from a low level of perceived familiarity and a low level of preferred independence.

(Insert figure 4)

4.3.8 Description of interventions aiming to increase incentive for forest visits among young adults in relation to conditional dimensions

Social activities in forests, preferred among YAs with low perceived familiarity and low preferred independence

Several of the interviewed young adults had no, or a very superficial relationship with the forest and forest visits, often only introduced through school trips. Many returned to the concept of boredom and argued that they could come up with very few reasons to spend time in the forest, at least alone. One participant argued that *it is a difference between whether you've been forced, or if you do it on your own initiative. If you sort of realize that it's fun first.* Therefore, young

adults believed that it is important for many people to have a thorough introduction to the forest and forest visits, and that this introduction needs to be fun for people to want to return there. As one participant stated:

> *"It has to be fun, otherwise it's nothing. The only reason why one would want to be alone, is something personal, and not for most people, so if you want to get people to be interested, it has to be fun. Something, that draws them again to it. It's just like going to an amusement park, if you're not having fun there, what would make one to come there again and spend money and. That's how you can relate it to this."* (FGD7)

Young adults further argued that social activities are a good opportunity to meet and interact with new people, and that these activities can create a sense of belonging in the forest, which was argued to be important when building a relationship with forest visits. A discussion that often arose in the aftermath of this was whether these activities should include competitive elements or not. Some argued that competitions attract more young adults, that it creates an adrenaline rush and makes it more fun. However, *if I was to visit a new social activity in the forest, and the first I hear is that I am supposed to partake in a competition*, one participant argued, *I would think that, nope, this is not for me*. Other participants reasoned in line with this, that competitions can cause negative associations with forest visits, if you come last, or if you experience the aforementioned performance pressure that was already considered to take up too much space during, for example, school trips to the forest. A combination of both, *something fun, but also with a chance of competing for those enjoying that*, was usually the resulting suggestion after discussion. Another argument for social activities that was raised was that young adults rarely have the energy to go to the forest alone, and an organized social activity would provide the "push" needed for it to happen.

Prolonging the period of regular school trips to forests to older ages, preferred among YAs with mixed perceived familiarity and low preferred independence

As previously mentioned, most young adults had positive memories of trips to the forest with the school when they were younger. However, it was felt that these school trips decreased in number from junior high, for some inexplicable reason. As one participant stated:

> *"It is true, it is like the school tells you that it's not cool anymore, or mature enough. (…) Then the school tells you that, okey, now we don't have to do this anymore. And you're like, but I liked it, but okay… And then you're like, I still want to, I miss it, there is something missing."* (FGD2)

The participants emphasize the importance of being introduced to the forest during their school years, as this provides a solid foundation and encourages people to revisit the forest later in life.

One participant emphasizes that *it is safer through school, as parents do not need to worry,* and another argues that there is a risk that young adults are afraid of being left alone, *that's why I think it's good if the school makes a system that involves all the students' friends*. Overall, participants expressed appreciation about their previous school trip experiences, and many proposed that trips with older student should focus on, i.e., *learning how to make a fire with rocks. (…) It's interesting to learn new things, instead of just repeating physical exercises that we already perform everyday in school.* Another participant argued similarly; *It would have been interesting to learn more about outdoor life, (…) we learn a lot of things about the forest when we are younger, like basic things, but I have forgotten everything now*. However, other participants requested *chill forest visits, just sitting by the bonfire or just hanging out there*. Evidently, older teenagers request school trips to forests, of which the content should be adapted to fit the wishes and desires among the students.

Addressing the negative attitudes about forest visits through discussion, preferred among YAs with high perceived familiarity and low preferred independence

Young adults feel that there is a notion of visiting forests to be considered weird by others. Many people who feel familiar with the forest feel that others do not talk about the forest or think that the forest feels silly. They feel that *you never talk about it [the forest], it doesn't appear in conversations* with others of the same age group. Many participants believe this, in line with the fact that one's relationship with forests are considered to be highly influenced by peer attitudes, may be a reason why forest visits are unusual in this age group. After the end of the recording, when reflecting upon the discussion, many participants expressed appreciation about the discussion, and felt relieved after thinking about happy childhood memories or strategies to reduce mental illness. Many vague proposals about *creating a new forest movement* or *introducing forest-influencers* on social media touches on this complex issue of addressing negative general attitudes on group level. Here, too, the role of the school as significant emerged in the shaping of young adults' relationship to the forest; *I also believe that if one had learnt more interesting stuff about the forest in school,* as one participant argued, *one would have appreciated it better. Because it's not like I have learnt any interesting things about the forest, only like names of trees and birds.* Many participants further argued that they get a skewed and insufficient image of the forest from school, often as a place where you only carry out (boring) orientation or too long hikes. The participants suggested that the school can be a place for information about forest activities, and a good place to start to address the negative attitude about forest visits. In addition, many believed that information to young adults about positive

health benefits from forest visits would increase interest and reduce negative attitudes towards visiting forests.

Leveraging social media to influence positive forest relationship, preferred among YAs with low perceived familiarity and mixed preferred independence

This suggestion is in line with much that has been said about the importance of changing the general social attitudes about forest visits. As previously mentioned, technology and the dependence on the phone are often barriers to forest stays, and one way to instead take advantage of the fact that today's young adults spend a lot of time on their phone is to promote forest stays through social media. As one participant suggested:

> *"It would have been fun to see a celebrity in the forest [on social media], who are usually not spending time there, to see what he/she thinks about it. Because then perhaps one would want to try it oneself, too."* (FGD10)

In addition to the suggestion about "forest-influencers" inspiring young adults on social media, suggestions about advertising or information on social media about forest stays often arose. *Advertising is very important,* one participant argued, *it is where we see everything.* Here, advertising or information can be designed depending on which target group is sought, but many believed that this is the information channel apart from school that can most effectively reach young adults.

Addressing the barrier of limited personal finances, preferred by YAs in general

The participants often raised concerns about the high cost of equipment required for forest activities, which they identified as a barrier preventing many individuals from trying and becoming familiar with such activities. Suggestions for providing free equipment lending, typically in the form of sports equipment like canoes or mountain bikes, were commonly proposed in the discussions. In addition, participants who reported less familiarity with forest stays mentioned that they lacked appropriate clothing to engage in such activities. This was usually argued against by participants with a higher level of perceived familiarity: *I could have gone out with what I am wearing now in the forest, perhaps whichever jacket I have at home, so I would say that it is not a barrier, one can wear almost anything in the forest*. This discussion is linked to the fact that some young adults perceive a lack of knowledge about staying in forests and nature, as well as a lack of experience in conducting activities in these settings, which could be addressed through information campaigns promoting forest visits. The discussions also highlighted the financial constraints faced by young adults, who expressed concern about the high cost of many forest activities and the need to work to earn money. To promote wider

participation, activities should therefore be made affordable or free. Suggestions like free public transportation, free equipment, or free cottages to lend in forest settings all touches upon the aspect of experiencing limited personal finances as a barrier. Nevertheless, some young adults did not consider money as a significant obstacle:

> *"It's only the transportation that would cost... If you choose to go with not just yourself with other things (...) like snacks, food, whatever, these are the extras that would cost but it's not really essential for such gatherings." (FGD7)*

Here we are dealing with uncertainty regarding what is required and what is available, which were suggested to be better addressed through information campaigns through schools or other channels.

Increase access to facilities such as toilets or drinking water in forests, preferred by YAs with high perceived familiarity and mixed preferred independence

In many cases, young adults who considered themselves to be familiar with forest stays have experienced a lack of certain facilities that would facilitate independent visits in forests. For instance, during a forest visit with friends, one participant reported that everyone had to go back *home after just one hour because there were no available toilets.* Another participant asked for drinking water pumps in forest settings, since she recalled that *when hiking during summer with friends, the problem is always that we need to bring a lot of water, and it always ends up with us only being able to stay one night.* However, some participants argued that introducing too many facilities and elements of human civilization in a forest environment would detract from the sense of wildness and nature one seeks when in the forest. They emphasized the importance of preserving the forest feeling and suggested that facilities should only be introduced in certain parts of the forest while leaving other parts untouched.

Access to cottages, cheap or free of charge, in forest settings, preferred by YAs with low perceived familiarity and high preferred independence

Numerous young adults who lacked prior experience in forest environments expressed a desire to rent cabins and spend the night there with friends, *because I personally feel that one feels better if one brings company, if one goes there alone, and is used to being around many people, one participant thought, one will not feel really, like, at home.* Often, participants presented the notion of a warm and welcoming atmosphere, where they could *gather around a bonfire, just chill, and discuss life.* Furthermore, discussions highlighted the financial barriers that prevented groups of friends or classes from affording the rental costs of forest cabins for excursions.

Additionally, long queues for available cabins limited accessibility during the summer season. *I think for the entire summer, that you won't get the chance to rent one [cabin in the forest],* one participant explained to another. Increasing access to forest cabins was suggested as a potential solution to foster an independent relationship with the forest among young adults, as it would provide a comfortable place to stay overnight and thus broaden the experience. This suggestion was predominantly raised by individuals who perceived themselves as having low familiarity with forest environments. Conversely, those who had high familiarity with the forest often had summer cottages or resided near forest environments and thus already spent considerable time in the forest.

Developing smartphone apps or maps for self-guided tours or games, preferred by YAs with mixed perceived familiarity and high preferred independence

During the discussions, a recurring theme was the frustration expressed by participants regarding the excessive time spent on phones and technology during their free time. Despite this, several suggestions were put forward that could utilize the fact that young adults are heavy mobile phone users. These included gamifying forest visits through activities such as Geocaching or treasure hunts. *It may work contra productive,* one participant argued, *if one gets totally stuck with looking at one's phone, but it might be a good start on the right track [towards liking forest visits].* Participants also expressed a desire for clearer and more up-to-date maps of forest areas, which could be made more interactive by digitizing them. *There are maps*, one participant stated, *but they are always very unclear*. Such measures were seen as a way to provide information and engage with visitors without introducing physical structures that could detract from the natural environment.

Providing convenient transportation to forest settings, preferred by YAs with high perceived familiarity and high preferred independence

In the upper corner of the model, a suggestion frequently proposed by individuals who are familiar with forests and prefer independent visits can be found. They feel that accessing the forest is currently a challenging task, mainly due to complicated or inadequate public transportation. As one participant put it, *often there is no bus stop [where one would want to go], there are no bus stops in the forest. (…) It should be.* The lack of transportation infrastructure in the forest is a major barrier to forest stays, particularly since individuals seldom have access to a car for independent visits and may feel uncertain about using public transport to get there. One participant who experienced the current public transportation to forests to be messy, proposed offering free buses from the inner city as a straightforward and cost-effective

way to attract many young adults to the forest. In line with this, another participant who himself lived close to the forest, suggested *some city bus track, that brings [city people] to the forest.*

5. Discussion

5.1 Overall findings

This study aimed to explore Swedish young adults' relationship to the forests and forest visits, focusing on mental health. Additionally, the study aimed to theorize what aspects that play a role in shaping young adults' incentive for forest visits, and how to address these to best increase the groups' interest in spending time in the forest. The study identified a core category that young adults like the idea of forests but rarely visit them. This was explored through six emerging themes, which revealed that young adults appreciate the positive emotions associated with being in the forest and the calm and free feelings it evokes. Childhood memories of positive experiences in the forest shape their perceptions of the forest as adults. However, young adults often feel bored in the forest, and many prefer to visit forests as a social activity. Performance demands associated with forest visits can counteract the calmness that they provide, and some young adults experience a fear of the forest, hindering them from staying for an extended period. To enable for the promotion of young adults' interest in forest visits, a two-dimensional explanatory model was developed, plotting nine interventions based on the participants' own ideas, in relation to two conditional dimensions that emerged from the data: the level of perceived familiarity and the level of preferred independence. The findings are showing variations in terms of an increased level of familiarity and preferred independence among young adults who either currently live close to forests, or who spent time in the forest with family during childhood, which refers to young adults who, generally, have a Swedish cultural background. Young adults' relationship with and interest in forest visits does not seem to differ much in terms of socio-economic conditions. On the other hand, the findings demonstrate the tendency that foreign-born young adults, who in this study were predominantly attending vocational high school programs, to a greater extent are connected to lower levels of both perceived familiarity and preferred independence during forest visits. Previous research has demonstrated variations in forest visiting behaviour depending on cultural, financial, and geographical factors, to name a few (Backman, 2003., Blomqvist, 2003., Public Health Agency of Sweden, 2019b., Statistics Sweden, 2021., Thurfjell, 2020). European researchers in the field of social integration and forest visiting behaviour have previously suggested that cultural and national background influence the type of preferred activity during forest visits, where (adult)

northern Europeans seem to prefer independent visits and hiking in forests, while (adult) people of non-European descent prefer social activities in a forest environment (Ek, 2011). The results of this report tend to align with these previous findings, but it is challenging to conduct this type of analysis without generalizing. Recruitment was carried out through initial sampling based on sociodemographic aspects, but during the process, the internal variation within the emerging dimensions was found to be too high to allow for generalization based on sociodemographic categorization. Through further exploration of variations in cultural background, the two emerging dimensions provides a clearer explanation for young adults' relationship with and preferences concerning forest visits. Through the construction of two dimensions instead of organizing findings based on sociodemographic categorization, the results are more strongly grounded in the participants' subjective perceptions of reality. However, it is worth noting that variations in cultural background seem to impact Swedish young adults' attitudes towards forest visits and should be taken into account when planning public health policies in this field.

The role of the school did not seem to affect the level of familiarity or preferred independence, as the students seemed to share roughly the same experience of forest visits from the school, regardless of other socio-demographic variations. However, it was clear that young adults are generally disappointed about the school not doing enough to get young adults out into the forest, especially in older ages. Regarding young adults' relationship with forest visits from a mental health perspective, the forest appears to positively affect young adults' mental health by acting as a counterpoint to elements that they believe negatively affect their mental health, such as addiction to technology, stress from school and society, and stressful urban environments. These findings align with previous research where a technology-oriented sedentary lifestyle and high demands on the individual from school and society are presented as potential causes for mental illnesses in the age group (Public Health Agency of Sweden, 2018).

5.2 Existing theories in relation to findings

The study confirmed the existing research on positive impact of forests on mental health, particularly in reducing stress and pressure from daily life, which young adults found calming and beneficial. This finding aligns with previous research on the calming effect of nature and is consistent with Kaplan's Attention Restoration Theory (1989) and Wilson's Biophilia theory (1984). The study also found that young adults' relationship with forests depends on their upbringing, time spent in the forest, and cultural background, which aligns with Gibson's theory

of affordance (1977). However, the lack of perceived affordance, prominent among participants with a lower level of perceived familiarity with forest visits, often leads to a feeling of boredom instead of engagement during forest visits. The study also identified the association between performance pressure and forest visits, which reduces young adults' intrinsic motivation to engage in such activities. This resonates with the Self-Determination Theory presented by Ryan and Deci (2000), which highlights the importance of autonomy, competence, and relatedness in promoting intrinsic motivation and engagement in activities. When young adults perceive forest visits as demanding and associated with performance pressure, it undermines their sense of autonomy and competence, and reduces their intrinsic motivation to engage in such activities. Therefore, promoting forest visits among young adults should focus on creating opportunities that enable them to experience the affordances of nature without the pressure of performance demands, offering activities that are more self-directed and exploratory, emphasizing the personal benefits of spending time in nature, and creating positive social experiences around forest visits. These findings provide insights for policymakers and forest managers to promote and enhance young adults' interest in forest visits, particularly in the context of mental health.

5.3 Existing policies and future strategies for planning public health policies.

The importance of promoting access and familiarity with natural environments to enhance young adults' perceived potential beneficial health effects from forest visits aligns with the social ecological model as well as the principles of health equity. The social ecological model suggests that an individual's development and behaviour are influenced by multiple interacting systems (Bronfenbrenner, 1981). In the WHO report “Promoting Health Equity” (Ramirez et al., 2008), it is argued that addressing the social determinants of health is essential to ensure health equity. These theories are in line with the explanatory model of the study, where two conditional dimensions were found to influence the experiences and desires of young adults regarding forest visits, which requires adaptable policies to ensure good health for the entire subpopulation. In Sweden, various initiatives and policies exist that aim to increase or preserve Swedes' interest in spending time in forests and nature, initiated by the Swedish Tourist Association (STF) and the Swedish Outdoor Association (Friluftsfrämjandet) among others. However, young adults report that their relationship with the forest is mainly shaped by schools or nearby youth organizations, and they feel that schools could do more to promote forest activities.

Young adults suggested that school trips are too performance-oriented and lack engaging activities such as learning about flora and fauna. Additionally, young adults would

like to see school trips to the forest continue up to high school and provide information and knowledge about forest activities to encourage more forest visits. The Swedish School Inspectorate has been able to demonstrate that the knowledge area of outdoor life and outdoor activities is given a very limited scope in almost all investigated schools (Swedish National Agency for Education, 2018). Debates about this are held regularly at the national political level, and the study's results are in line with officially noted structural deficiencies and insufficient follow-up of national school curricula regarding the subject (Nilsson & Klingberg, 2019). The lack of equipment for forest activities is another reason why many young adults do not get out into the forest and nature. The Leisure Bank initiative (Fritidsbanken, 2023) enables borrowing of equipment for outdoor activities free of charge, and it is growing in establishment throughout the regions of Sweden. However, this study demonstrates that young adults are not familiar with this initiative, indicating a need for further promotion.

Young adults also requested the possibility of being able to rent cabins or spend the night near the forest at a low cost. Such initiatives already exist (Enequist, 2023) but seems to require further promotion to reach young adults. In terms of social activities in forest environments, the majority of the participants had limited experience and perceived organizations, leisure centres, and the scouts as distant, particularly as they grew older. Individuals who were unfamiliar with forest stays suggested that social activities should prioritize being enjoyable rather than educational or competitive. The findings suggest a knowledge gap among young adults regarding existing opportunities for social activities in forests. Initiatives that provide young adults with a positive introduction to the forest and help develop a greater interest in different types of forest stays are needed. These initiatives should prioritize being enjoyable rather than educational or competitive. Such initiatives would help promote access and familiarity with natural environments among young adults and contribute to health equity.

5.4 Methodological considerations

This study used Charmaz's approach to Grounded Theory to construct a core category based on six emerging themes and a conceptual model to answer the research questions about young adults' relationships with forest visits. The study applied Charmaz's criteria for Grounded Theory studies to ensure the research achieved intimacy with the topic, provided new insights, portrayed the fullness of the studied experience, and offered useful interpretations to everyday life. The study also aimed to contribute new knowledge and construct a conceptual model that can be utilized in public health policies.

Physical rather than virtual FDGs were deemed suitable for the data collection. The advantages of physical discussions include ease of follow-up, interpretation of facial expressions, body language, underlying moods, and the ability to act as a reliable and responsible moderator (Barbour, 2007). Moreover, there are significant risks that participants may lose focus and engage in other activities during virtual group discussions (Hennink, 2014), which is a risk that was deemed particularly high given the participants' age and technological familiarity. Physical discussions were also more suitable given the recruitment method, which mainly took place on participants' physical home ground. Peer debriefing and both initial and theoretical sampling were utilized to increase the credibility and confirmability of the study and reduce the potential for bias or error in data collection. Maximum variation ensures a more reliable and credible result through the representation of the entire study population, and theoretical sampling increases credibility through assuring that the emerging findings are saturated with all conditions and proportions varying within the study population that are found to influence or affect the findings (Charmaz, 2006). The study also addressed the concepts of dependability and transferability when evaluating the trustworthiness of a qualitative study, as presented by Dahlgren et al. (2019). The transferability was enhanced by selecting diverse participants and offering home-baked treats and sweets as a form of compensation, encouraging even those individuals with limited interest in forests to participate in the interviews. Thestudy did not reach its goal of maximum variation in terms of current occupation nor age, consisting entirely of students, most of which were high school aged. While efforts were made to recruit a more diverse group, the study's endeavour to represent the entire study population as much as possible thus fails. Furthermore, sampling to achieve variation in terms of socioeconomic background was solely based on whether the participants study in a college-preparatory or vocational-preparatory high school program and could be more neatly addressed to ensure for maximum variation. Statistics from the Youth in Europe Study (YES!) show that only 37 percent of young adults aged 19 – 20 in Sweden are students, while 47 percent are job seekers and around 10 percent neither study nor work (Plenty et al., 2018). On the other hand, mainly young people aged 16 – 19 were interviewed, an age group where only a vanishingly small percentage in Sweden do not study at high school, which means that the representativeness and thus the credibility of the study is higher for young people in high school, and variations within this group, than for young adults aged 20–25. Furthermore, theoretical sampling was utilized based on cultural background, which during the analysis were found to influence young adults' relationship to and interest in forest visits. Thus, the sub-population of high school aged students can be considered well-represented. The study's documentation of the interviews may have been

damaged by the lack of a second researcher who takes notes in the background, which may affect its dependability.

6. Conclusion

This study examined the mental health perspective of young adults' relationship to forests and forest visits. Six emerging themes were identified, which show how young adults experience positive health effects of forest stays, such as stress reduction and a feeling of getting away from everyday pressures. However, the study found emotional and material barriers that hinder young adults from spending time in the forest, such as performance pressure and issues with transportation. By constructing a two-dimensional explanatory model as the final product of the joint analysis, the study theorizes what underlying conditional dimensions that shape and affect young adults' incentive for forest visits. By presenting a description of young adults' own suggestions for interventions, plotted in relation to the emerged dimensions of perceived familiarity and preferred independence, the model can be used and adapted to a greater extent according to local and regional needs. The study suggested that there is a huge potential for future public health policies to increase forest visits among young adults, and a great interest from young adults in the implementation of these policies. As mental ill-health among young people is a significant threat to public health, the knowledge gained from this study can provide a theoretical basis for further research in such a relevant field. The conceptual model presented can also be used to plan for preventive public health policies that may potentially reduce or prevent stress-related mental illness among young adults in Sweden. However, it is noteworthy that the findings of this study rely on a participant pool in which the goal of maximum variation was attained solely for high school students between the ages of 16 and 18. Consequently, forthcoming research pertaining to this topic should concentrate on the older segment of this age group to ensure optimal representativeness, in order for planned policies to improve the mental health of the entire group.

7. References

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Figures and Tables

Listed according to their order of presentation.

Figure 1

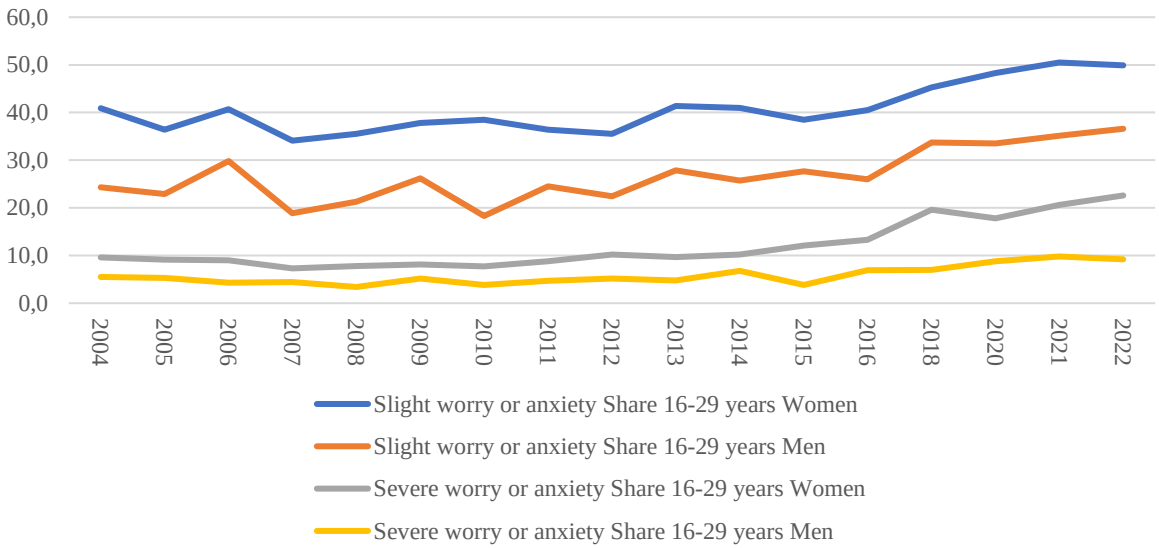


Figure 1. Share (in %) of self-reported mental health among 16 – 19-year-olds in Sweden, sorted by gender, 2004 – 2022.

Figure 2

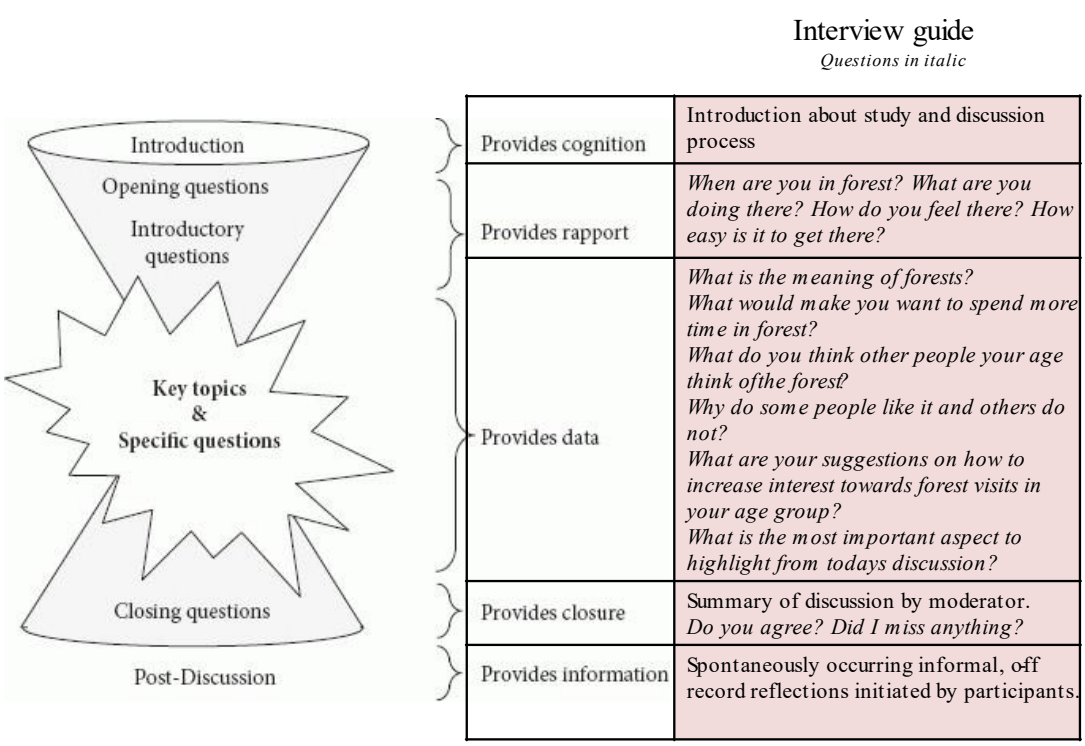


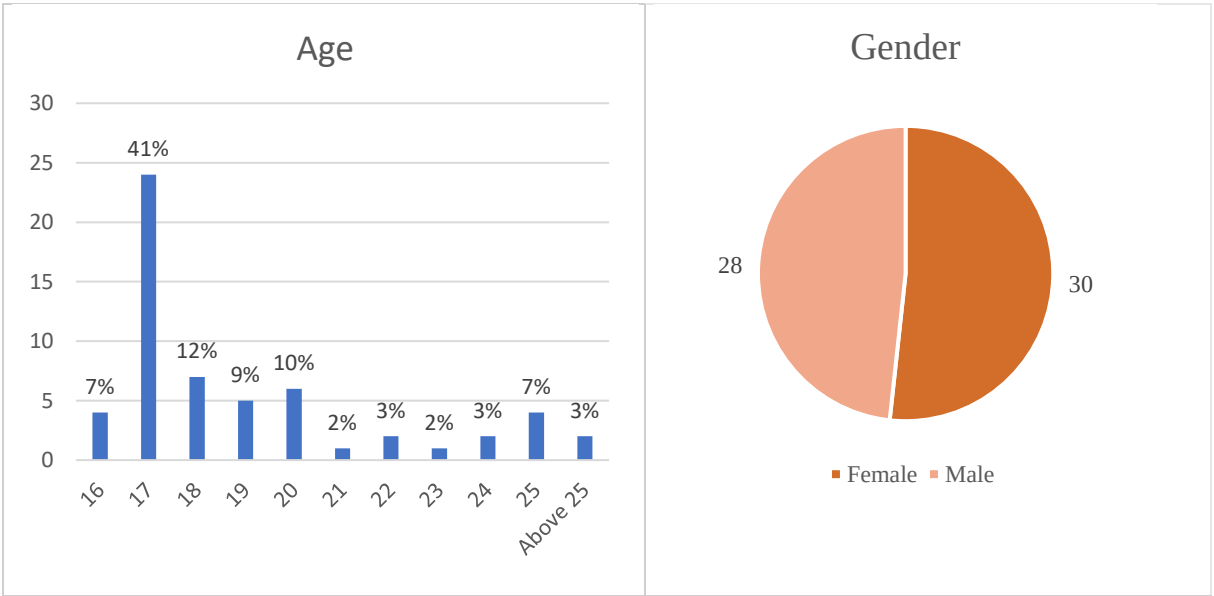
Figure 2: Description of the interview guide arranged in the hourglass design established by Monique Hennink. The original model is modified with the specifics for this study presented in the coloured box.

Table 1

Text	Code	Subcategory	Category	Theme
"It is just nice. No stress. It is harmony. One does what one likes."	Feeling that one can do what one likes in the forest	Feeling relieved by less restrictions in forest	Experiencing a sense of freedom from forest visits	Positive mental health benefits of forest visits, including improved mood, relaxation and stress relief
"…like, it is not human problems or human things one thinks of, it is more like one is becoming a creature *laughter*"	Thinking that one is allowed to be less human-like in forests			
"…one gets like, one feel free in general, one is free."	Getting a sense of freedom when in forest	Feeling free when in forest		
"Life, kind of. Mother nature. Freedom. Yes, freedom is a good word for it."	Thinking that forest reminds one of life and freedom			
"No, because in the forest there is no one judging you.	Believing the forest to be opposite of social norms	Feeling relieved by less social demands in forests		
"this is like, the forest, we are free! *laughs* And it's like, everyone are equal."	Feeling that everyone becomes equal when in forest			
"Well, it is free of charge and accessible for everyone and not something that only certain people can use."	Feeling that forest is freedom since it is accessible to all	Appreciating that everyone has access to forest		
"It is accessible for all, and that is very nice."	Feeling positively about that forest is for everyone			

Table 1: Illustration of GT focused coding process through clustering similar initial codes into emerging subcategories eventually forming the category Experiencing sense of freedom from forest visits, contributing to the theorizing of the theme Positive mental health benefits of forest visits, including improved mood, relaxation and stress relief.

Figure 3



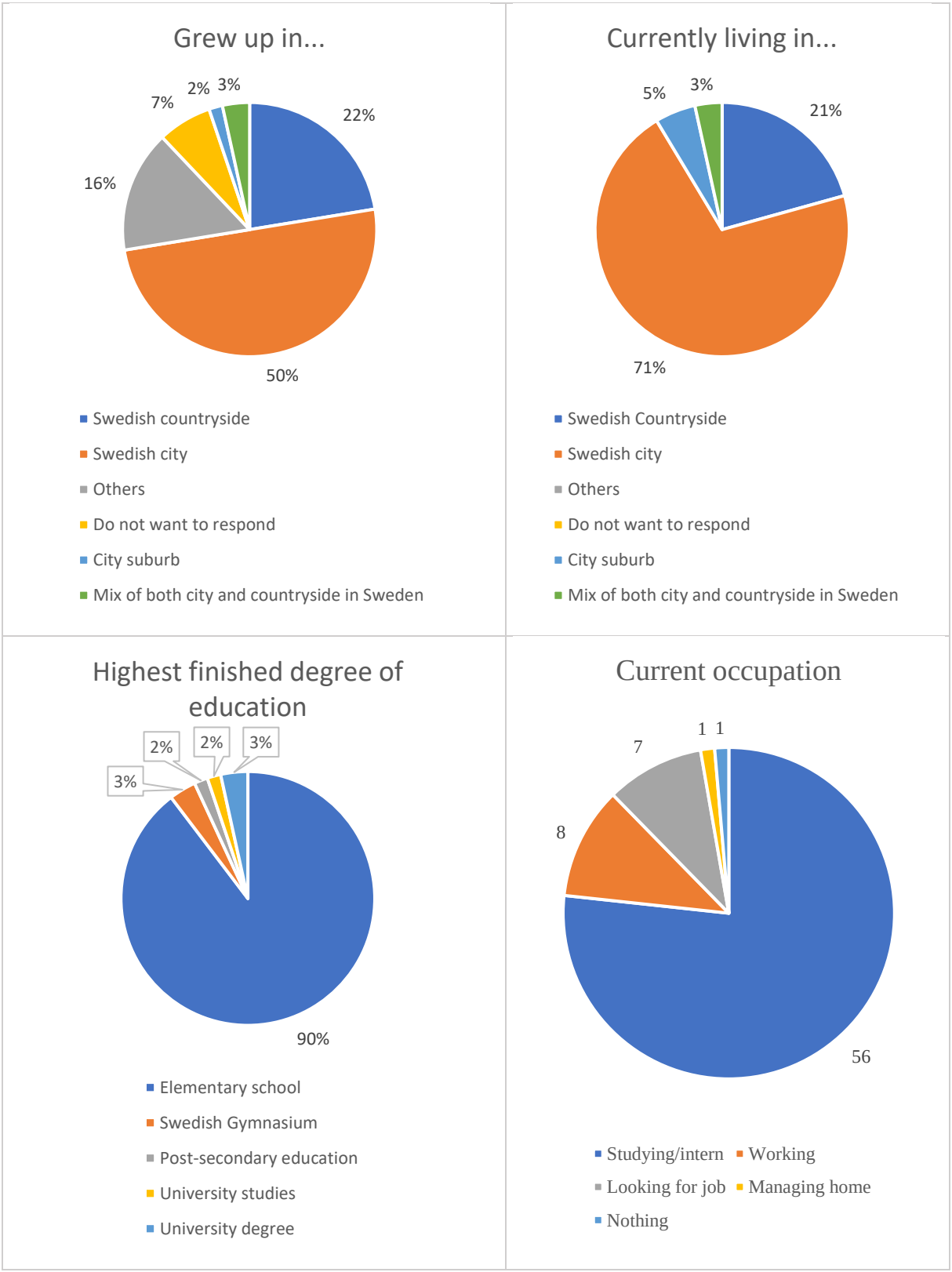


Figure 3: Participant demographics. Countries mentioned as others in Grew up in… were Bosnia, Syria, Morocco, Thailand, Moldova, Nigeria, Jordan, Pakistan, and Iraq, each representing one respondent. As the participants were allowed to tick multiple boxes under Current occupation, the shares are presented in total number of responses.

Table 2

Name of FGD	Overall demographic characteristics
FGD1	Mixed genders, Swedish cultural background, median age 17, mixed residence, university preparatory high school education
FGD2	Majority female, Swedish cultural background, median age 22, majority countryside residence, vocational high school education
FGD3	Males, foreign cultural background, median age 18, urban residence, vocational high school education
FGD4	Males, majority of foreign cultural background, median age 17, urban residence, vocational high school education
FGD5	Females, majority of foreign cultural background, median age 17, urban residence, vocational high school education
FGD6	Females, mixed cultural background, median age 17, urban residence, vocational high school education
FGD7	Males, foreign cultural background, median age 18, urban residence, vocational high school education
FGD8	Mixed genders, Swedish cultural background, median age 25, urban residence, university education
FGD9	Males, Swedish cultural background, median age 17, countryside residence, vocational high school education
FGD10	Females, mixed cultural background, median age 17, countryside residence, vocational high school education

Table 2: A list of all focus groups and their characteristics. Presented in the results section are line break quotes whose references correspond to the focus group names presented above. When the group is referred to as "mixed," it signifies an approximate 50/50 representation of a particular characteristic. When the group is referred to as "majority," it indicates that more than 50% of the participants possess the characteristic. In the absence of both "mixed" and "majority," 100% of the participants possess the characteristic.

Table 3

Subcategories	Categories	Themes	Core category
Using forest as a mental health resource	Experiencing mental health and well-being benefits from forests	Positive mental health benefits from forest visits, including improved mood, relaxation, and stress relief	Young adults like the idea of being in the forest, but are rarely there
Using the forest for contemplation and introspection			
Appreciating the feeling of forest to be distant (philosophically)			
Promotion of forest therapy for mental health benefits			
Enjoying being alone in nature			
Enjoying the forest looks	Appreciating sensory inputs from forests		
Enjoying the silence that the forest provides			
Enjoying the sounds of forest			
Enjoying the special forest air			
Enjoying the special forest scent			

Enjoying to exercise in forest	Considering forest to be a place for exercising		
Feeling that others exercise in forest			
Wanting to get away from disturbing urban elements	Feeling that forest stays provides opportunity to "get away"		
Not wanting to meet others in forest			
Feeling irritated that others disturb the calmness in forest			
Feeling that the forest activates another kind of thinking / attention	Experiencing amazing effect on mind from forest visit		
Being in forest creates special, more-than-words feeling			
Considering forest visits as a somehow religious act			
Feeling less stressed after forest visit			
Experiencing frustration about being addicted to technology	Experiencing worries that technology and constant entertainment affect today's YA negatively		
Thinking that the use of technology is barrier to forest visits			
Feeling that the hook on technology is damaging YA's future			
Experiencing an urge to be forced to be bored and leave phone behind			
Feeling free when in forest	Experiencing a sense of freedom from forest visits		
Feeling relieved by less restrictions in forests			
Feeling relieved by less social demands in forests			
Appreciating that everyone has access to forest			
Feeling that forest is natural	Considering forest to create sense of belonging and origin		
Feeling that body is meant for forest visits			
Feeling pressured and disturbed in city			
Experiencing a forest to be "real" only with no elements of civilization	Emphasizing and preferring sense of wilderness when defining forest		
Experiencing all distant forests to be equal in vibe			
Experiencing forest definition to be vague			
Experiencing that all forests nearby are less authentic, more controlled			
Experiencing a difference in feeling between park and forest			
Happy to see wild animals			
Appreciating that forest provides resources	Experiencing opportunity to gather resources from forest		
Considering others to use forest for resources			
Happy memories of childhood in forest	Valuing the role of childhood experiences in building a positive relationship with forests	Childhood experiences and family influence on building a positive relationship with forests	
Arguing that forest relationship gets stronger if initiated during childhood			
Recalling forest experiences with family	Experiencing positive family influence on forest experiences		
Reasoning that forest-positivity is shaped by family trips			
Recalling to have been introduced to forest through school	Recalling introductions to forest through organized activities		
Recalling having been in forest with youth organization			
Preferring being in forest with social company	Appreciating socializing in forests	Socialization as important aspect of enjoyable forest visits, partly to avoid boredom	
Positive feelings about new acquaintances in forests			
Experiencing higher quality on social hangout in forest			
Appreciating social activities in forest setting			
Negative attitudes towards being alone in the forest	Disliking being alone in nature		
Easily bored in forest when alone			

Wishing for school trips to forest in older ages	Promoting interest in forests through social activities		
Social activities as key to engage with forests			
Seeking and proposing organized activities for engaging with forest			
Suggesting competition and playfulness in forest setting			
Introduction and familiarization with forests may increase interest			
Experiencing fear and safety concerns in forests	Feeling scared in forests	Fear, irritation, and performance pressure in forest as potential barriers to positive mental health experiences	
Feeling that crimes are more common in forest setting			
Being aware that worries are irrational, still scared			
Being afraid of dangerous animals (humans included)			
Feeling that a deeper forest is more scary			
Considering forests scary only during nighttime			
Feeling that cities are safer than forests			
Disliking the sense of feeling obligated or forced to visit the forest	Negative feelings towards performance pressure and mandatory forest visits		
Feeling forced to perform well during forest stays ruins the nice forest effect			
Wishing for less demanding forest stays			
Experiencing a negative (compulsory) school effect on forest stays			
Being anti-sport/competition in forest setting			
Disturbed by insects in forests	Experiencing insects to be a negative aspect with forests		
Feeling that insects are necessary for forest			
Considering insects to be one of few negative aspects with forest			
Thinking that public transportation to forest is not doing good enough	Experiencing physical barriers to accessing forests	Material and physical barriers to accessing forests, including lack of time and energy	
Feeling that a car is needed to get to forest			
Feeling disconnected from nature due to physical distance from forest			
Experiencing lack of access to forest equipment	Experiencing material barriers to forest visits		
Suggesting free and normalized equipment for YA			
Wishing for free forest activities			
Believing in economic incentives to increase interest			
Preferring forest during nice weather	Preferring forest during nice weather		
Feeling to have less free time than other age groups	Experiencing lacking time as barrier towards forest visits		
Feeling pressured by too many musts			
Feeling pressured when thinking about future			
Only having time for forest during holidays			
Experiencing that limited free time is barrier to forest visit			
Easy to be in forest when living close	Feeling that vicinity to forests builds stronger relationship		
Arguing that uprising close to forest shapes relationship			
Arguing that access to summer houses builds forest relationship			
Arguing that the sense of familiarity increases time spent in forest			
Experiencing frustration about lack of facilities in forests	Appreciating facilities in forests		
Appreciating existing facilities in forests			

Calling for more facilities in forest settings			
Not having energy enough to get to forest	Experiencing that forest visits require too much energy		
Experiencing the need for someone to push one to forest			
Feeling that forest visits require too much planning			
Experiencing to not prioritize forest visits			
Experiencing transportation to forest to be easy	Feeling forest to be near		
Experiencing sense of living close to forest			
Not using forest for introspective reasons	Not supporting the idea of the forest as a place for contemplation	Acknowledging, but not agreeing, with general notion of forest visits considered weird	
Not using forest as mood-handling strategy			
Experiencing to be in forest to DO something			
Not supporting the concept of forest existentialism			
Wishing to learn more about forest in school / through organisations	Frustration about lack of information and knowledge about forest		
Feeling that information about forest activities are lacking			
Arguing that information about forests would increase interest			
Feeling that there are misconceptions about forests among YA			
Feeling that others are uninformed			
Considering young adults below 20 to spend least time in forest	Experiencing YA to be less interested in forest than other groups		
Connecting forests visits to sense of obsolescence			
Experiencing that YA prefer partying and being in city			
Reasoning forests visits occur in groups with fewer exciting options			
Experiencing that YA prefer unhealthy things			
Experiencing a positive view on forest visits on social media	Believing social media to influence forest relationship among YA		
Believing social media to impact YA's attitude towards forests			
Thinking social media could positively affect YA's attitude towards forest			
Experiencing that liking forest is sometimes considered weird / lame by others	Experiencing that attitudes towards forest visits are shaped by societal factors		
Experiencing not to agree with notion of liking forest to be weird / lame			
Experiencing that attitudes towards forest depends on social circle			
Experiencing society and culture to shape YA's attitudes towards forest			
Feeling that being in forest is a Swedish thing			
Experiencing that people with non-Swedish background are less in forest			
Experiencing that Swedish forest is part of national proudness	Experiencing a split towards national romantic forest idea		
Feeling that forests are too romanticized			
Preferring nature abroad			
Not spending any time in forest personally	Experiencing a lack of interest towards but general liking of forest visits		
Not interested at all in forests personally			
Considering forest stays to be boring in general			
Feeling to visit and appreciate forest more than average			
Feeling frustrated about other's lack of interest in forests			

Feeling that YA likes idea of forest but are rarely there			

Table 3: Visualisation of the first stage of the joint analysis: the sub-categories, categories, themes, and the core category. This table constitutes the foundation for the later stages of analysis, together with notes, memos, and demographic information.

Figure 4

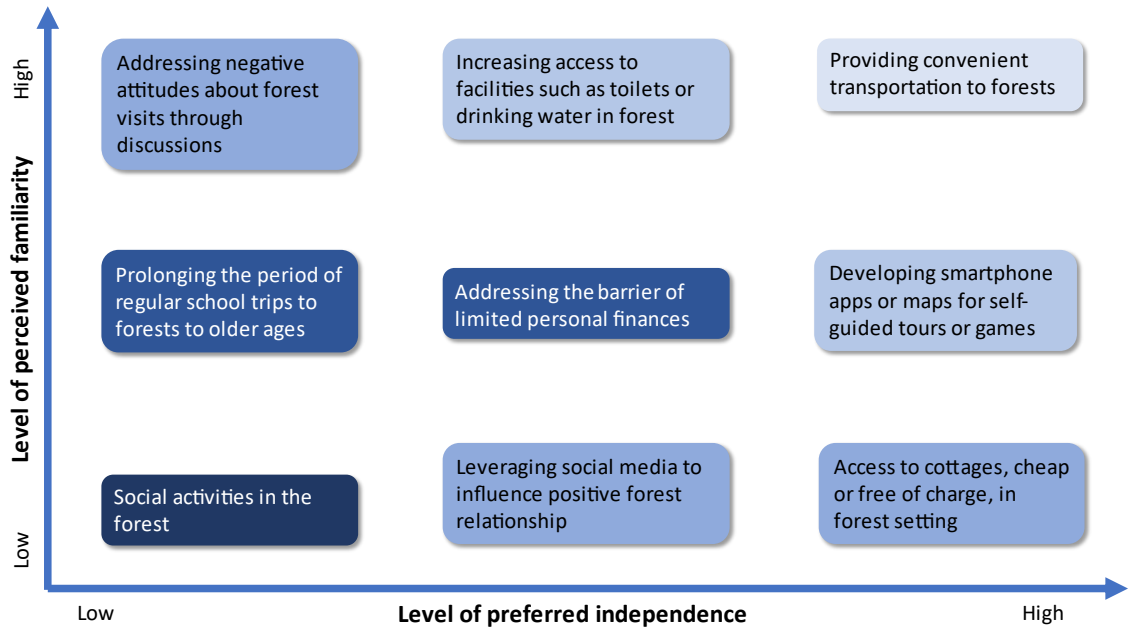


Figure 4: A two-dimensional conceptual model of young adult's own suggestions and ideas of how to increase interest about forest visits in their age group. The X-axis represents the level of preferred independence during forest visits. The Y-axis represents the level of percieved familiarity with forest visits. The presented interventions are grounded on the suggestions constructed by the participants during the discussions, but modified, adjusted, reconstructed and plotted in relation to the emerged dimensions, thus constituting the final product of the joint analysis.

Appendices

Appendix 1 – Demographic survey, translated to English

Demographic survey concerning the project "Young adults' relationship to forest visits"

What is your age?

☐ 16 ☐ 17 ☐ 18 ☐ 19 ☐ 20 ☐ 21 ☐ 22 ☐ 23 ☐ 24 ☐ 25

What gender are you? With gender we mean gender identity, i.e., the gender you identify yourself as.

- ☐ Woman
- ☐ Man
- ☐ Non-binary
- ☐ Other option
- ☐ I do not want to respond

Where did you grow up?

- ☐ In the countryside in Sweden
- ☐ In an urban environment in Sweden
- ☐ Other, please specify: _____
- ☐ I do not want to respond

Where do you currently live?

- ☐ In the countryside in Sweden
- ☐ In an urban environment in Sweden
- ☐ Other, please specify: _____
- ☐ I do not want to respond

What is your highest completed education?

- ☐ Primary school or equivalent
- ☐ High school diploma or equivalent
- ☐ Post-secondary education, not college/university
- ☐ Studies at college/university
- ☐ Degree from college/university
- ☐ I do not want to respond

What is your current occupation? You can choose multiple options

- ☐ Studying, practicing
- ☐ Professional worker
- ☐ Work leave or parental leave
- ☐ Labour market measure
- ☐ Job seeker
- ☐ Sick leave
- ☐ Long-term sick leave (more than 3 months)
- ☐ Taking care of own household
- ☐ Other, please specify: _____
- ☐ I do not want to respond

Appendix 2 – Interview guide, translated to English

Semi-structured Interview Guide

Young adults' relationship to forest visits

Area 1: Past experiences of forest visits When are you usually in the forest?

- When you are there, what do you usually do?
- How do you feel when in the forest?
- (What do you think about spending time in the forest?)
- (Why is it calming to be in the forest?)

Area 2: Access to forest

- What does "the forest" mean to you?
- How easy is it for you to get to the forest?
- What barriers are there that hinder you to spend time in the forest?
- (What would make you spend more time in the forest?)

Area 3: Group attitudes concerning forest visits

- What do you think other people of your age think about the forest?
- Why?

Area 4: Suggestions and ideas, guided by creation of mindmap

Do you have any suggestions or ideas for societal measures to increase the interest for forest visits in you age group? There are no limitations, you may say anything you want.

Ending question:

- What would you say is the most important thing to remember from this discussion? (or similar question)

Summary by the moderator

- Do you all agree? Have I missed anything?

Appendix 3 – Information and consent, translated to English

Young adults' relationship to forest visits

Information about participating in the research project.

Information about the project

I am a master's student in the Public Health program at Lund University and plan to conduct a study within the framework of my program. I want to ask you if you would like to participate in a study within a research project called "Young Adults' Relationship to Forest Visits"? Through this project, I want to gather knowledge about the importance of forests for health and well-being, focusing on young people and young adults (aged 16-25) and their thoughts on forests and forest visits. In addition, I want to gather young adults' suggestions and ideas on societal actions to increase the group's interest in the forest, in order to later design useful prevention methods aimed at young people and young adults to limit the development of stress-related mental illness. The reason I'm asking you to participate in the study is that you're part of the target group of young people and young adults aged 16-25. The research principal for the project is Linnaeus University. By research principal is meant the organization responsible for the project.

What does a yes entail?

If you agree to participate, you will be part of a focus group discussion lasting about 40 minutes with 5-7 other participants in the same age range. The group discussion will be conducted at a location we agree on. On-site, before the discussion, an individual survey will be answered that requests simple demographic information (age, gender, origin, etc.). The discussion will be led by me as moderator and will follow a semi-structured interview template that addresses questions such as "How do you feel in the forest?" or "What do you usually do in the forest?" and concludes with a workshop where the group creates a common mind map. The group discussions will be recorded and transcribed verbatim. All collected information, both from the survey and recorded material, will be coded during the process. Thus, there is no risk that a certain statement or information will be linked to you as a person. Since the project aims to gather knowledge about your thoughts and feelings, there is a risk that the discussions will occasionally touch on sensitive topics that feel uncomfortable to talk about. To minimize this risk, I, as the person responsible for the project, will participate and lead the group discussions.

Information about the study's results

You will be able to access the study's results in the form of a master's thesis that is preliminarily completed in late spring 2023.

Participation is voluntary

Participation in the project is entirely voluntary. You can choose not to participate at any time, and you do not need to say why. If you choose not to participate anymore, this will not affect your future relationship with Linnaeus University or the person through whom you were recruited for this study. If you no longer wish to participate, please notify one of us responsible for the project, see contact information below.

Processing of personal data

If you choose to participate, the project will use certain information about you, namely your thoughts and experiences about the forest, as well as a small amount of background information. This information will be collected through a focus group discussion and a survey in connection with it, but will be coded and de-identified during the processing of the results. In addition, mainly data at the

category level, where several statements have been collected in a category with common content, will be used for publication. Any quotes used will be coded so that no individual can be identified. The electronic material will be stored on Linnaeus University's server with password-protected login, and only the researchers will have access to the material. The information will thus be treated confidentially. When the project is completed and published, all data will be deleted after a maximum of 10 years. Audio files will be deleted after the publication of the results.

According to the EU's General Data Protection Regulation and national supplementary regulation, you have the right to:

- Withdraw your consent without affecting the lawfulness of processing based on consent before its withdrawal
- Access your personal data
- Correct your personal data
- Delete your personal data
- Restrict processing of your personal data

Refreshments and home-baked treats and sweets are provided in connection with the group discussion.

Contact information

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Popular Science Summary

Mental illness is a growing public health issue among young adults in Sweden. Spending time in nature, particularly forests, has been shown to have positive health effects, especially concerning stress-reduction and mental recovery. At the same time, young adults in Sweden are spending increasingly less time in forests.

This study used qualitative grounded theory methodology to investigate young adults' relationship with forest visits and construct a conceptual model with suggestions on how to increase interest in forest stays in the age group. Data from ten groups with a total of 58 participants were collected through focus group discussions.

The study found that young adults like the idea of being in the forest but rarely visit there. Barriers preventing them from visiting included emotional and material aspects, such as performance pressure and complicated public transportation, to name a few. The proposed measures to increase forest visits in this age group are presented through a conceptual model based on the level of perceived familiarity and preferred independence of the target population. These findings can serve as a basis for preventive public health policies to address stress-related mental illness among young adults in Sweden.