

Young Adults in Nature-Based Services in Norway—In-Group and Between-Group Variations Related to Mental Health Problems

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Abstract

Young adults with mental health problems who do not attend school or work constitute a significant welfare challenge in Norway. The welfare services available to these individuals include nature-based services, which are primarily located on farms and integrate the natural and agricultural environment into their daily activities. The aim of this study is to examine young adults (16–30 years old) not attending school or work who participated in nature-based services in Norway. In particular, the study analyses mental health problems among the participants and in-group variations regarding their symptoms of mental health problems using the Hopkins Symptoms Checklist (HSCL-10). This paper compares symptoms of mental health problems among participants in nature-

based services with those of a sample from the general population and a sample of those receiving clinical in-patient mental healthcare. A questionnaire was developed for the study and was completed by 93 participants in nature-based services. The majority of these participants were recruited from the Norwegian Labour and Welfare Administration (NAV), local mental health services, and school authorities. Results indicate that just more than half of the respondents exhibited symptoms of mental health problems based on their HSCL-10 scores. In general, they reported fewer symptoms than the clinical in-patient sample (18–30 years old) and more symptoms than the general population sample (18–19 years old). Among the participants in nature-based services, those recruited through NAV and local mental health services exhibited no differences in symptoms. Half of the participants older than 23 years in nature-based services had not completed upper secondary school. The participants, including those with symptoms of mental health problems and low expectations at the outset of their participation, generally expressed high satisfaction with the services.

Keywords: nature-based services, HSCL-10, mental health problems, young adults

Introduction

The aim of this study is to examine young adults (16–30 years old) not attending school or work who participated in nature-based services in Norway. In particular, we focus on mental health problems among the participants and in-group variations regarding their symptoms of mental health problems, as measured using the Hopkins Symptoms Checklist (HSCL-10). Mental health problems are a leading cause of illness and disability worldwide (WHO, 2015, 2018) and are widespread among the adolescent and adult populations in Norway (Reneflot, Aarø, Aase, Reichborn-Kjennerud, Tambs, & Øverland, 2018).

Unless otherwise indicated, references to mental health problems in this paper are based on the HSCL-10, which measures symptoms of anxiety and depression. We are well aware that mental health problems are comprised of additional parameters. However, for the aims of the current comparative research, the HSCL-10 instrument is considered useful. When the concept of mental health problems is applied in a more general sense, and based on participants' subjective reporting in the first part of the questionnaire, we refer to ailments that are troublesome, reduce quality of life, and reduce ability to function, but that are not necessarily manifested in psychiatric diagnoses.

There is growing concern of young adults' mental health in Norway. Mental health problems may affect their ability to participate in different areas of society—for instance, in working life (Nes & Clench-Aas, 2011). Knowledge about how mental health problems among young adults in Norway developed over time is limited. Hence, there exists uncertainty about whether or not the prevalence of mental health problems among young adults has increased over the last three decades, although some international research indicates this is, indeed, the case (Collishaw, Maughan, Natarajan, & Pickles, 2010; Potrebny, Wium, & Lundegård, 2017). However, there are indications that at least the consequences of having mental health problems have increased among young adults in Norway in recent years. For instance, the number of young adults receiving disability pensions in Norway increased from 7,657 individuals in 2009 to 16,879 in 2018 namely for diagnoses of mental health- and behaviour-related problems (Guldvåg, 2017; NAV, 2018c). Work assessment allowances given for the medical reason of mental health problems also increased during that time (NAV, 2018b). In August 2018, almost 70% of the 26,260 recipients of work assessment allowance under the age of 30 suffered from mental health problems (NAV, 2018a); this indicates that a large number of young adults in Norway are not in school or employed due to mental health problems. According to a qualitative study conducted by Ramsdal, Bergvik, and Wynn (2018), mental health problems are one reason young adults drop out of school. Young adults with mental health problems can experience difficulty completing their education, and disappointments in school may intensify their mental health problems. The labour market's increasing emphasis on communication competence and relational and social skills poses special challenges for this population. This might partly explain the increased public benefit costs related to mental health problems (Berg & Thorbjørnsrud, 2009; von Soest & Hyggen, 2013). Norway offers various welfare services to young adults with mental health problems who are not in school and do not work. The services are offered through schools, local mental health services, and the Norwegian Labour and Welfare Administration (NAV).

Nature-based services as social work interventions for young adults with mental health problems

The welfare services offered to young adults with mental health problems outside school or work in Norway include nature-based services usually termed Green Care or Green Work. These are offered through public services (e.g., NAV, local and specialised mental health services, or schools) in collaboration with private providers (e.g., farms). In principle, NAV offers Green Work, while

the public health sector and schools provide Green Care. However, the provided services possess strong similarities, and one service can simultaneously include Green Care and Green Work participants who are receiving identical interventions. This study treats nature-based services as a unified concept including both Green Care and Green Work. By our definition, these nature-based services often, although not necessarily always, use a farm setting to deliver specifically designed, structured, and facilitated services to individuals with defined needs (Bragg & Atkins, 2016).

The nature-based services utilise no single model of organisation. In some cases, the service providers directly contract with and report to public health or welfare services. In other cases, third parties, such as NAV, are responsible for securing the services and ensuring their quality. The services combine components from traditional labour-market measures with more flexible and personal adaptive solutions (Kogstad, Eriksson, Granerud, Hummelvoll, Lauritzen, & Batt-Rawden, 2012). This strategy recalls a fundamental approach in social work: to find and adapt interventions that make it possible for an individual to overcome social problems (Levin, 2004). These services share a connection to nature. For the most part, they are located on farms and utilise nature in their daily activities, including maintenance work, cooking, and caring for animals and plants (NAV, 2011).

Previous research on nature-based services for people with mental health problems

Nature-based services are available for a range of various groups of participants worldwide (Artz & Davis, 2017; Berget & Braastad, 2008; Elings & Hassink, 2008; Mallon, 1994; Sahlin, Matuszczyk, Ahlborg, & Grahn, 2012; Toyoda, 2013). Participation in nature-based services is found to be related to improved mental and physical health for participants with mental health problems, both in Norway and internationally (Berget & Braastad, 2008; Elings & Hassink, 2008; Ellingsen-Dalskau, Berget, Pedersen, Tellnes, & Ihlebæk, 2016a; Ellingsen-Dalskau, Morken, Berget, & Pedersen, 2016b; Granerud & Eriksson, 2014; Hassink, Elings, Zweekhorst, Van den Nieuwenhuizen, & Smit, 2010; Kogstad, Agdal, & Hopfenbeck, 2014; Pedersen, Ihlebæk, & Kirkevold, 2012a; Steigen, Kogstad, & Hummelvoll, 2016).

Health-promoting factors in nature-based services for people with mental health problems include work tasks that facilitate experiences of mastery (Granerud & Eriksson, 2014) and flexibility—meaning, for example, that participants can participate irrespective of their daily functioning (Hassink et al., 2010). Support

from the social community, including the farmer and other participants, is important. This support helps participants feel safe and experience a sense of belonging while utilising the services (Elings & Hassink, 2008; Hassink et al., 2010; Pedersen et al., 2012a). Participants appreciate their interactions with animals, as they may feel understood, accepted, and not judged by the animals as they otherwise might be by humans. In addition, participants feel valuable when caring for the animals (Pedersen et al., 2012a). For many participants, nature represents a sanctuary in which they may escape from everyday stressors (Ellingsen-Dalskau, 2017).

An increasing number of studies address nature-based services in Norwegian and international contexts. Nevertheless, scholars emphasise the need for more research, particularly on content regarding nature-based services, the groups who are offered these services, and the effects of the services (Iancu, Hoogendoorn, Zweekhorst, Veltman, Bunders, & van Balkom, 2015). Most of the published research studies use qualitative approaches, although there are some studies focusing on nature-based services that use quantitative methods (Ellingsen-Dalskau et al., 2016a). Most of the national and international quantitative research focuses on specific interventions, mostly within research experiments. For example, such an intervention may measure health outcomes from interacting with animals for a certain number of hours per week (Berget, Ekeberg, Pedersen, & Braastad, 2011; Pedersen, Martinsen, Berget, & Braastad, 2012b). Consequently, the existing research does not provide much information about participants in nature-based services that are not part of research projects. Moreover, to the best of our knowledge, there exists no previous study using quantitative approaches with a focus on young adults with mental health problems participating in nature-based services. In addition, no previous research studies on this topic have used comparative approaches. Additional knowledge about participants in nature-based services may contribute toward the development of services adapted to participants and their needs.

The aim of this paper is to examine mental health problems among young adults participating in nature-based services in Norway. We focus on variations related to mental health problems among sub-groups of participants in relation to, for example, gender, age, and the circumstances of their recruitment. Furthermore, this study utilises a comparative design.

Method

In this comparative study, data from a general population sample and a clinical in-patient sample of individuals receiving mental health care are analysed alongside the sample of participants in nature-based services.

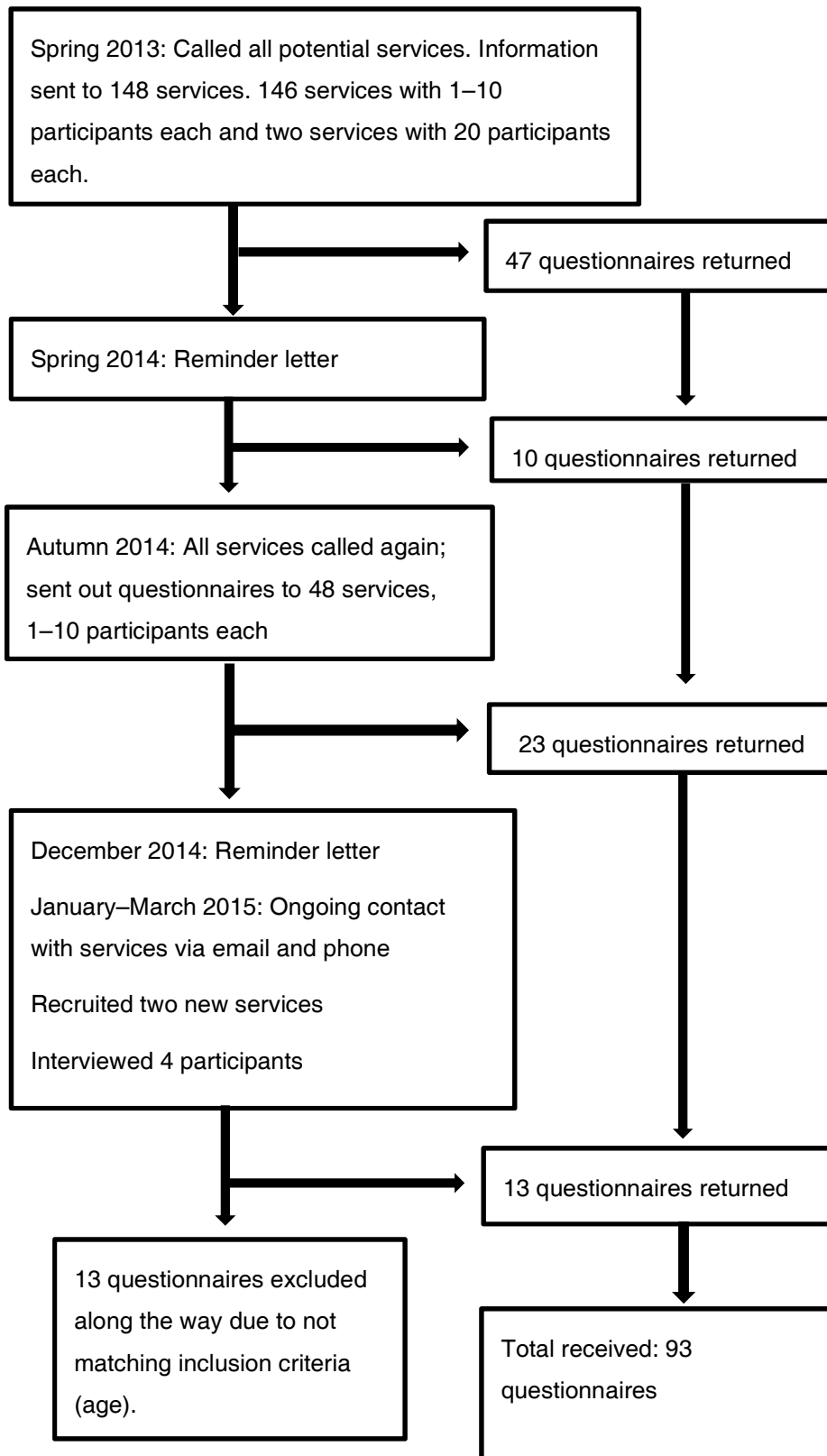
Material and data collection in the nature-based services sample

The study participants consisted of young adults 16–30 years old who only partly or never attend school or work and are enrolled in services due to mental health-related problems, drug-related problems, or both. They participated in any of the available nature-based services in Norway, such as Green Care or Green Work. We excluded potential participants without Norwegian language skills sufficient enough to understand the questionnaire.

We recruited participants from all regions of Norway. We mapped all nature-based services through NAV, agricultural interest organisations, Matmerk (a nongovernmental organisation responsible for authorisation of Green Care farms), and online searches. In spring 2013, we contacted approximately 600 services by phone to determine whether they had participants in the target group who met the inclusion criteria. In total, 148 nature-based services reported they had potential informants for our study. We calculated the number of questionnaires necessary to distribute based on the number of participants in the services. In addition, questionnaires for potential new participants were distributed. The service and NAV leaders were responsible for distributing informative letters and questionnaires to potential informants. We also administered the service leaders a form to record the number of participants informed about the study so we were able to determine the response rate. Unfortunately, many leaders did not return the form; consequently, the response rate could not be calculated using this method.

In August 2014, we again contacted all 148 services by phone. Some services did not have any new participants. Approximately two-thirds of the service leaders determined that, after receiving the questionnaires and the informative letters, they did not have participants in the target group. Thus, at the time we facilitated the second round of calls, only 48 services had relevant participants. When possible, we offered to allow the participants to respond to the questionnaire in structured, face-to-face interviews, and four participants at two services chose to do so. Due to this small number, this data collection method likely did not influence the overall results. The first author conducted the interviews. A total of 93 participants living in sixteen of nineteen Norwegian counties participated in the study (see Figure 1 for details of the data collection).

Figure 1: Flow chart of the data collection process



Response rates

Challenges associated with accurately estimating the size of the population of young adults participating in nature-based services made it difficult to estimate the response rate. Based on the information obtained during localisation of potential informants, we concluded that the size of the target group was smaller than initially anticipated. The information from service leaders in August 2014 indicated that the study population during the time of our data collection included 150–200 individuals.

The questionnaire

The questionnaire consisted of three parts. The first included questions about the participants, the second included questions about the nature-based services in which the participants were enrolled, and the third consisted of three standardised instruments related to mental health, social support, and sense of coherence. In this paper, we report on the two first parts of the questionnaire and the Hopkins Symptoms Checklist-10 (HSCL-10) (Derogatis, Lipman, Richels, Uhlenhuth, & Covi, 1974; Strand, Dalgard, Tambs, & Rognerud, 2003), the latter of which is utilised in part three of the questionnaire.

HSCL-10 is a short version of the Hopkins Symptom Checklist-25 (HSCL-25) that is used to measure symptoms of depression and anxiety (Derogatis et al., 1974; Strand et al., 2003). Studies targeted toward youth have widely utilised this instrument (Haavet, Sirpal, Haugen, & Christensen, 2010; Kleppang & Hagquist, 2016; Strand et al., 2003; Sjøgaard, Bjelland, Tell, & Røysamb, 2003). The questionnaire consists of ten items describing common symptoms or problems. Participants rate the extent to which these symptoms or problems bothered or distressed them during the previous week. Examples of items include: 1) how much has 'feeling suddenly scared for no reason' bothered or distressed you in the past week? and 2) how much have 'feelings of worthlessness' bothered or distressed you in the past week? The participants selected their responses from four response alternatives: (1) not troubled, (2) slightly troubled, (3) quite troubled, and (4) very troubled. After summing the variable values (raw scores) for each person, we calculated a total score to be used in the analysis. Additionally, we compared the value obtained by dividing the total score by the number of items with a cut-off score. Previous studies commonly set this cut-off at 1.85 and considered individuals with mean scores higher than 1.85 as having symptoms of anxiety and depression (Strand et al., 2003).

To test psychometric properties, we conducted a Rasch analysis of the HSCL-10. The scale shows satisfactory psychometric properties with a Person

Separation Index of 0.869 (a working paper—available upon request from the first author—describes details of this analysis). As explained above, the concept of mental health problems used in this paper is primarily related to the results from the HSCL-10, which specifically measures symptoms of anxiety and depression. This has also been done in other studies (see e.g. Kleppang, Thurston, Hartz, & Hagquist, 2017). This use of the HSCL-10 to measure mental health problems does not deny that the concept can be, and usually is, interpreted in a wider sense.

Brief description of the clinical and the general samples

The clinical sample consists of 31 individuals 18–30 years of age (mean = 24.74; SD = 3.44; median = 24). These participants were recruited from a specialised psychiatric centre in Norway that treats patients with long-standing or treatment-resistant trauma, anxiety, eating disorders, and depressive disorders. The multidisciplinary clinical staff consists of psychiatrists, psychologists, nurses, art therapists, occupational therapists, social workers, and pastoral staff. The centre does not admit patients with severe self-destructive behaviour, psychotic disorders, or substance use disorders (SUDs), although some patients had comorbid SUDs. Data were collected at the start of a twelve-week rehabilitation programme. The data collection was active from March 2015 through April 2016. Data were collected as part of a major study entitled DARCY (for details on DARCY, see Toft, Neupane, Bramness, Tilden, Wampold, & Lien, 2018).

We used ten items corresponding to HSCL-10 from the Symptom Checklist 90 Revised (SCL-90-R) (Derogatis, 2010; Siqveland, Moum, & Leiknes, 2016; Strand et al., 2003), as this scale was used with the clinical sample. The SCL-90-R has five response categories: (0) not at all, (1) slightly, (2) medium, (3) much, and (4) very much (Derogatis, 2010). We recoded the responses to allow for a comparison of mean values across the samples. We collapsed categories 2 (medium) and 1 (slightly), and recoded the response categories so they had values of 1–4, similar to the HSCL-10 instrument used in the sample of participants in nature-based services. Cronbach's Alpha was 0.869 for the scale with five response categories and 0.872 for the scale with four collapsed response categories. The scales with five and four response categories had a high correlation, with a Pearson's $r = 0.993$.

We drew data for the general population sample from Ungdata (data on young people), conducted by NOVA (Norwegian Social Research) in cooperation with regional centres for drug rehabilitation (KoRus). Ungdata is an annual cross-national data collection scheme designed to conduct youth surveys at the

municipal level in Norway. The Norwegian Directorate of Health, the Ministry of Children, Equality and Social Inclusion, and the Ministry of Justice and Public Security are financiers of Ungdata (for more information, see NOVA, 2016). We analysed the 2014 Ungdata data on young adults in the third grade of upper secondary school (18–19 years old) throughout Norway. We included data exclusively from respondents who answered all the items measuring symptoms of anxiety and depression, resulting in a sample of 9,459 respondents (male = 3,829, female = 5,278, missing value for gender = 354). NOVA (2014) includes more information about the 2014 Ungdata data.

The Ungdata survey includes nine items corresponding to nine items in HSCL-10. We use these nine items for comparison with the clinical and nature-based populations. Ungdata 2014 does not include the item 'feeling useless, of little worth', thus we excluded this item from the HSCL-9 scale items. First, we compared the clinical sample and the nature-based services sample based on all ten items in HSCL-10 and obtained a cut-off score for the two samples. Second, we compared all three samples based on the nine common HSCL-10 items (hereafter, HSCL-9). When using HSCL-9, we were unable to calculate a cut-off score.

Statistical analysis

We analysed all data using SPSS 24.

Ethics

The Norwegian Regional Ethics Committee for Southeast Norway (2012/372) approved this study on young adults in nature-based services. The participants received a letter regarding the study, which informed them that participation was voluntary and that the published results would not identify individuals. We mailed pre-paid envelopes to the participants with instructions for returning the questionnaire. We also offered to let them respond to the questionnaire by phone, as we expected some potential respondents to possess difficulties concentrating, reading, and/or writing. However, none chose this option. Initially, we asked the participants to sign a written consent form and return it along with the questionnaire. The service leaders informed us that this procedure might decrease some potential participants' willingness to participate. Therefore, we changed the procedures so that returning the questionnaire counted as providing consent. The ethical committee approved this method, and the participants who responded to the questionnaire in structured, face-to-face interviews signed written consent forms.

The distribution of the questionnaire by the service leaders could have posed an ethical difficulty due to the risk that some participants might have felt obliged to participate or respond in such a way they believed would please their leaders. However, we mitigated this risk by allowing all participants to return the questionnaire themselves (using pre-paid envelopes) as well as complete the questionnaire at home.

The Norwegian Regional Ethics Committee for Southeast Norway (2014/2189) approved the clinical study. The fourth author informed all potential participants about the study, handed out written information, and distributed a consent form to each potential participant. The Norwegian Social Science Data Services approved the Ungdata study, which includes an anonymous survey and voluntary participation. For more information on the ethical considerations in Ungdata, see NOVA (2016).

Results

Background variables and descriptive statistics of the sample from participants in nature-based services

The sample included slightly more female participants (56%) than males (44%) and a mean age of 22.66 years (SD = 3.84). Dividing the informants into three groups based on age revealed that the largest group was aged 21–25 years (Table 1). The highest completed level of education was lower secondary school for approximately 57% of the sample, upper secondary school (vocational and specialisation in general studies) for 39%, and university for 4% (Table 1). Among the informants 23 years and older, 50% had not completed upper secondary school. Additionally, 11% and 78% of the informants reported that drug-related problems and mental health problems, respectively, contributed to their reasons for participating in the service. Combining these variables indicates that nearly all respondents who reported drug-related problems as a contributing reason also confirmed mental health problems contributed to their reason for participation.

Most informants accessed nature-based services through NAV (71.4%), while others accessed them through local mental health services (14.3%), school (9.9%), and services (4.4%), such as child welfare (Table 1). The participants possessed varying levels of knowledge regarding nature-based services when they started the programme; 37% had heard about nature-based services, approximately 57% had not, and 7% claimed they did not know whether or not they had heard about the services. The majority of participants (64.1%) reported

positive or no expectations before starting the service, while one-third (35.9%) reported negative or mixed expectations (Table 1).

Table 1. Background variables and descriptive statistics of the sample from nature-based services.

Variable	Categories	N	%
Gender (n = 93)	Female	52	56.0
	Male	41	44.0
Age (mean = 22.66, SD = 3.84, mode = 16) (n = 89)	16–20 years old	27	30.3
	21–25 years old	42	47.2
	26–30 years old	20	22.5
Highest completed education (n = 91)	Lower secondary school	52	57.1
	Upper secondary school (vocational and specialization in general studies)	35	38.5
	Higher education (university college and university)	4	4.4
Mental health reasons for participation (n = 89)	Yes	69	77.5
	No	20	22.5
Drug-related reasons for participation (n = 90)	Yes	10	11.1
	No	80	88.9
Referral for a place at the service (n = 91)	NAV*	65	71.4
	Mental health service	13	14.3
	School	9	9.9
	Other/don't know	4	4.4
Expectations for the stay (n = 92)	Positive or no expectations before start	59	64.1
	Negative or mixed expectations before start	33	35.9
Duration of stay at the service (n = 91)	3 months or less	28	30.8
	4–11 months	37	40.6
	12 months or longer	26	28.6
Frequency of attendance at the service (n = 89)	4–7 days a week	50	56.2
	3 days a week or less	39	43.8
Overall satisfaction with the service (n = 91)	Very or quite pleased	85	93.4
	Mixed	5	5.5
	Quite or very displeased	1	1.1

*NAV: Norwegian Labour and Welfare Administration

At the time of data collection, the duration of time the participants had been involved in the services ranged from one week to more than twelve months. Regarding frequency of visits to the service, the majority of respondents attended their respective services four or more days a week (Table 1). The majority of respondents (93.4%) reported feeling overall very or quite pleased with their respective services (Table 1).

Comparative analysis of mental health by HSCL-10 and HSCL-9 between the three samples

We used HSCL-10 to measure the participants' mental health (anxiety and depression symptoms) and found a mean value of 20.88 (SD = 8.46) among the respondents in the nature-based sample. We summed each participant's answers to calculate a raw score and divided that score by the number of items answered to obtain a cut-off score, as suggested by Strand et al. (2003). With a cut-off score of 1.85 (Strand et al., 2003), slightly more than half of the participants reported symptoms of mental health problems (54.4%) (Table 2). The clinical sample had a mean value of 24.81 (SD = 6.60) for HSCL-10, and 80.6% of the clinical sample had scores higher than the cut-off score of 1.85 (Table 2).

Table 2. Comparison of reported symptoms of mental health problems (HSCL-10) in the

Sample	N	Mean [median] (SD)	% over 1.85
Nature-based service sample	93	20.88 [20] (8.46)	54.4
Clinical mental health sample	31	24.81 [25] (6.60)	80.6

nature-based service sample and the clinical mental health sample.

Cut-off score on HSCL-10 is 1.85, meaning those scoring higher than 1.85 are considered as having mental health problems.

As previously mentioned, we selected nine items from the HSCL-10 to compare all three samples (but without the possibility of calculating a cut-off score). On HSCL-9, the nature-based sample had a mean value of 18.80 (SD = 6.66), the clinical sample had a mean value of 22.23 (SD = 5.88), and the general population sample had a mean value of 16.79 (SD = 6.02) (Table 3).

Table 3. Comparison of reported symptoms of mental health problems (HSCL-9) in the nature-based service sample, the clinical mental health sample, and the general

Sample	N	Mean [median] (SD)
General population sample	9459	16.79 [16] (6.06)
Nature-based service sample	93	18.80 [18] (7.66)
Clinical mental health sample	31	22.23 [23] (5.88)

population sample.

These findings indicate that the participants in nature-based services generally reported fewer symptoms of mental health problems than did the clinical sample, while they generally reported more symptoms than did the general population sample.

In-group analysis of the participants in the nature-based services related to HSCL-10. Gender and age related to symptom score.

Considering HSCL-10 scores and gender, female participants (mean = 23.2, SD = 8.55) reported significantly more symptoms of mental health problems than did male participants (mean = 17.80, SD = 7.39). The rate of participants with scores greater than the cut-off score also differed significantly by gender (Table 4), supporting findings from previous studies (Bremnes, Martinussen, Laholt, Bania, & Kvernmo, 2011; NOVA, 2014; von Soest & Hyggen, 2013; Wichstrøm, 1999). An analysis of age differences in reported symptoms of mental health problems discovered statistically significant differences in the mean symptom scores ($p < 0.05$) between the youngest age group (16–20 years old) and the middle age group (21–25 years old). Additionally, the number of participants with scores higher than the cut-off point in these two age groups differed significantly. We detected no significant differences between the participants aged 26–30 years old and the other two age groups (Table 4).

In-group variation related to recruitment criteria, recruitment sites and subjective expectations

As mentioned previously, the participants were recruited through NAV, local mental health services, school authorities, and smaller services, such as child welfare. The participants who were recruited through schools exhibited significantly fewer symptoms of mental health problems than those who were recruited through NAV and mental health services (Table 4).

More than three of four participants subjectively reported mental health problems as contributing reasons for their participation. Slightly more than half of the participants had scores for symptoms of mental health problems greater than the cut-off value of HSCL-10. The available data did not determine differences in symptoms of mental health problems, as measured by HSCL-10, related to whether drug-related problems were a contributing reason for participation (Table 4). The respondents with positive expectations or no expectations prior to starting the services exhibited significantly fewer symptoms of mental health problems related to HSCL-10 than did those with mixed or negative expectations (Table 4). We found no significant differences related to HSCL-10 scores between groups with different durations of participation in their respective services.

Table 4. Statistical tests of differences in the groups related to HSCL-10.

Variable	Categories (N)	Mean [median] (SD)	% over 1.85
Whole group	93	20.88 [20] (8.46)	54.4
Gender	Male (52)	17.80 [17] (7.39)**	41.0
	Female (41)	23.2 [23] (8.55)	64.7
Age	16–20 years old (27)	17.86 [13] (9.05)**	35.7
	21–25 years old (42)	23.60 [23.5] (8.21)	65.0
	26–30 years old (20)	20.95 [20] (6.62)	60.0
Referral for a place at the service	NAV*** (65)	21.98 [20.5] (8.66)*	59.7
	Mental health service (13)	22.00 [21] (7.43)	61.5
	School (9)	13.89 [12] (6.53)	11.1
	Other/don't know (4)	16.25 [16] (7.23)	50.0
Mental health reasons for participation	Yes (69)	23.48 [23] (8.07)**	68.2
	No (20)	12.91 [12] (3.54)	9.1
Drug-related reasons for participation	Yes (10)	24.0 [25.5] (7.67)	75.0
	No (80)	20.49 [19] (8.54)	51.9
Expectations for the stay	Positive or no expectations before start (59)	18.23 [17] (6.98)**	40.4
	Negative or mixed expectations before start (33)	25.41 [26] (9.08)	78.1
Duration for stay at the service	3 months or less (28)	19.33 [15] (9.20)	44.0
	4–11 months (37)	21.84 [21] (8.25)	64.9
	12 months or longer (26)	21.44 [21] (8.06)	52.0

Frequency of attendance at the service	4–7 days a week (50)	20.08 [17.5] (8.88)	46.0
	3 days a week or less (39)	21.82 [21.5] (8.07)	63.2

*Differences in median values were calculated using Mann–Whitney and Kruskal–Wallis tests. Significant results are marked with asterisks * $p < 0.05$, ** $p < 0.01$.*

Differences in proportions were calculated with two-tailed z-tests. Significant differences in proportions ($p < 0.05$) are marked with brackets.

Cut-off score on HSCL-10 is 1.85, meaning those scoring higher than 1.85 are considered as having mental health problems.

**** NAV: Norwegian Labour and Welfare Administration*

Discussion

In this study, we examined mental health problems among young adults not attending school or work who participated in nature-based services in Norway using both in-group and between-group comparisons.

Mental health problems among young adults participating in nature-based services

Our results indicate that slightly more than half of the participants in the nature-based sample reported symptoms of mental health problems according to their HSCL-10 scores. There is limited knowledge from previous research regarding mental health problems in this group. However, Ellingsen-Dalskau, Berget, Tellnes, and Ihlebæk (2017) reported that more than 70% of participants (aged 19–65) in prevocational training on care farms in Norway reported symptoms of anxiety and depression. This study used a different instrument for measuring mental health (not HSCL-10), and thus the results are not directly comparable although they nevertheless support the finding that many participants in nature-based services in Norway struggle with mental health problems. The results are additionally in line with the overall trend showing that the majority of young adults receive social insurance due to mental health problems (Ellingsen-Dalskau et al., 2017).

Furthermore, the results from this study indicate that 50% of the participants older than 23 years of age have not completed upper secondary school. Overall, in Norway, nearly 30% of young adults fail to complete upper secondary school within five years after initial enrolment (Statistics Norway, 2017). Previous studies also report that participants in nature-based services generally have a low level of education (Ellingsen-Dalskau et al., 2017).

Some considerations are raised by the differences between HSCL-10 scores and the number of participants who subjectively reported (in the first part of the questionnaire) mental health problems as a reason for participation. These differences might indicate that participants' assessments of their own mental health is not always in accordance with standardised measurements of mental

health problems. However, the participants' mental health might have also improved during participation. In addition, it is important to keep in mind that mental health problems may encompass challenges other than those measured by the HSCL-10.

Expectations and satisfaction

Nearly all participants reported that they were pleased or very pleased with the nature-based services. These results are in accordance with previous studies using qualitative approaches on similar target groups in Norway (Ellingsen-Dalskau et al., 2016b; Granerud & Eriksson, 2014; Kogstad et al., 2014; Pedersen et al., 2012a). An interesting proposal for further research would be to compare the satisfaction rates among this group with similar groups participating in other types of services.

The participants' expectations prior to attending the services might also have influenced their satisfaction with the services. Nearly two-thirds of the participants had positive expectations, which might have resulted in high satisfaction with their respective services. The participants who had negative or mixed expectations reported more symptoms of mental health problems according to HSCL-10 than those who had positive expectations. However, the participants expressed that they were pleased or very pleased with the services regardless of earlier expectations or symptoms of mental health problems. These findings are important, as positive experiences and subjective satisfaction with services could potentially contribute to increased self-esteem and thus play an important role in the recovery process.

In-group differences in the nature-based sample related to mental health problems.

The analysis did not show any positive correlation between duration of participation in the services at the time of data collection and symptoms of mental health problems. The group was not homogeneous, and those with the most severe problems at the outset might require a longer duration of participation.

When considering recruitment, one might expect that participants recruited from local mental health services would have higher symptom scores than those recruited from NAV, the latter of which focuses on clients who are expected to be able to return to work within a relatively short time. However, as previously mentioned, the findings indicate no differences in symptoms of mental health problems among people recruited through NAV or through local mental health services. These results may indicate that it is not possible to classify the participants into clear categories based on the method of recruitment. A more

productive method may include focusing on participants' individual adaptations, resources, strengths, and interests. An earlier study indicates that recruitment into nature-based services largely occurs by happenstance (Steigen & Kogstad, 2014). The overlap between the samples further confirms this observation.

Participants in nature-based services compared to the clinical and the general population samples

Overall, the participants in the nature-based services had higher scores for symptoms of mental health problems than did the general population sample, and lower scores than did the clinical sample. These results support the assumption that the nature-based group possesses different needs than do the other two samples. That is, these participants may benefit from low-threshold services as represented by the nature-based services in this study.

Even given the finding that the participants in nature-based services fall between the general population sample and the clinical sample along the HSCL-10 continuum, it is still difficult to achieve a congruent picture of this group. For instance, compared to the clinical sample, the nature-based sample showed greater variation in their duration of participation at the time of data collection, which might affect the differences between these groups in terms of reported symptoms of mental health problems. The standard deviation (SD) in these two group samples confirmed this possibility, with a higher SD in the nature-based services sample. The SD also indicates that there is an overlap between the samples (Table 3). This further indicates that some individuals in the nature-based sample have the same symptom score as some of those in the clinical sample. The analysis demonstrates that the participants recruited through NAV and local mental health services had a HSCL-10 mean value closer to that of the clinical sample than that of others in the nature-based sample. The data suggest that nature-based services respond to different needs than do more specialised services. Because we have limited insight into different client careers, we should also exercise caution when making judgements regarding initial problems in different groups. What would have happened if a person in the clinical group had instead received nature-based services at the outset and vice versa?

Methodological considerations

We found data collection to be a primary challenge in this study. Despite our diligent efforts to recruit as many informants as possible, we encountered significant challenges during this process. As a consequence, the small sample size constitutes a weakness in this study. The number of young adults

participating in nature-based services appears to be lower than we estimated during the first round of mapping all the services. Other possible reasons for the low sample size include the unstable market for nature-based services in Norway, leading to frequent changes in the number and types of services offered. In addition, many participants may have refused to participate due to personal problems that made completing the questionnaire challenging.

Ellingsen-Dalskau et al. (2016a) conducted a quantitative study on participants aged 18–66 years in prevocational training programs on farms in Norway and reported difficulty estimating the response rate due to similar challenges we encountered in our study. Their participants had the same gender distribution as our population, but a wider age range (Ellingsen-Dalskau et al., 2016a). Additionally, the majority of their respondents received services through NAV (slightly more than 50%) or mental health care (40%) (Ellingsen-Dalskau et al., 2016a).

Strengths and difficulties

A notable strength of this study is that it is the first quantitative study on this population both in Norway, and, to the best of our knowledge, internationally. This study contributes unique and important data. Additionally, comparing reported symptoms of mental health problems between participants in nature-based services, a general population sample, and a clinical mental health sample allows for the describing of the group of participants in nature-based services in a wide context in relation to other groups of young adults.

As previously mentioned, this study faced problems related both to the recruitment process and the organisation of the services. Distributing the questionnaires through a third party might have complicated the recruitment process, as service leaders might have failed to provide information about the study to all potential informants. Finally, our study also demonstrates that the field of nature-based services poses special methodological challenges due to instability, a variety of services, and problems with comparisons. This aspect, to a large degree, complicates data collection, and future studies should address this complication.

Conclusion

This study makes important contributions that may be considered in future studies conducted with nature-based services or other welfare services for young adults with mental health problems. It increases our knowledge about participants in nature-based services, particularly through the comparisons with

general and clinical population samples. The results from this study are also valuable for the development and adaptation of nature-based services toward meeting the needs of their participants. There is partial overlap in symptom scores between individuals in the nature-based sample and those in the clinical sample, while there is also some overlap in scores between the nature-based sample and the general sample. These overlaps increase the possibility that more individuals may experience the same satisfaction if offered nature-based services. This possibility warrants further investigation, as additional knowledge may improve the general understanding of what kinds of services are effective and for whom they are effective (Hyggen, 2015).

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