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To cite this article: Leiv Einar Gabrielsen, Leif Torvald Eskedal, Terje Mesel, Gunnar Oland Aasen, Martin Hirte, Reidun Erene Kerlefsen, Vibeke Palucha & Carina Ribe Fernee (2018): The effectiveness of wilderness therapy as mental health treatment for adolescents in Norway: a mixed methods evaluation, International Journal of Adolescence and Youth, DOI: [10.1080/02673843.2018.1528166](https://doi.org/10.1080/02673843.2018.1528166)

To link to this article: <https://doi.org/10.1080/02673843.2018.1528166>



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Published online: 29 Oct 2018.




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The effectiveness of wilderness therapy as mental health treatment for adolescents in norway: a mixed methods evaluation

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ABSTRACT

This paper investigates the effectiveness of a Norwegian wilderness therapy programme, *Friluftsterapi*, which is offered to adolescents within a specialized mental health care setting. This mixed methods study incorporated (1) psychometric pre-, post-, and 12 month follow-up data, (2) executive functioning data, and (3) qualitative data from two rounds of individual participant interviews. The results indicate that group averages remained largely the same between the pre- and post-tests, however that health measures generally improved one year later (Cohen's *d* effect sizes ± 0.5). Interview data revealed that the processing of the *Friluftsterapi* experiences takes time and that for many several months are required before the impact is fully internalized and translated into improved daily functioning. In conclusion, the *Friluftsterapi* experience is perceived as valuable, and it appears to contribute towards improving the mental health of many participants. A refined version of the treatment programme is suggested and briefly presented in the conclusion.

ARTICLE HISTORY

Received 9 July 2018
Accepted 21 September 2018

KEYWORDS

Wilderness therapy;
Friluftsterapi; mixed
methods; mental health
treatment

Introduction

Friluftsterapi, therapy in the open air, is Norway's first comprehensive wilderness therapy clinical research project. This may seem odd, considering our country's close and intimate utilization of the outdoors for leisure and work (Henderson & Vikander, 2007; Reed & Rothenberg, 1993). We have a number of renowned outdoor education college and university programmes, and Norwegian academics were arguably the founders of the deep ecology branch of Eco philosophy (e.g. Naess, 2008). Furthermore, there is a considerable public health focus on promoting outdoor activities as a means of enhancing quality of life and health, and there is little doubt that this message resonates well. In 2017, 78% of the population had been on hikes in the forest or in the mountains, 53% had been on longer hikes, and 34% had participated in cross-country skiing (Statistics Norway, 2018). In short, the interaction between man and nature is still a distinct part of the Norwegian culture, and the benefits to one's health of being outdoors are well appreciated (Gabrielsen & Fernee, 2014; Henderson & Vikander, 2007). Still, within our specialized health care services, few systematic efforts have been made to harness the effects of conducting therapy, with intentionality and precision, in the outdoors, and until this study, none have combined such efforts with comprehensive mixed methods research.

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Wilderness therapy

Wilderness therapy is a diverse but gradually unifying field of interventions that encompass individual and group therapy in natural settings. Activities may range from facilitating experiences of quiet attentiveness to more high-pressure challenges, both of which are considered to engage participants who may appear less responsive to more traditional approaches to treatment. Preferably conducted in the wild, nature itself is understood as a key component in initiating and strengthening therapeutic processes (Gabrielsen & Harper, 2017; Harper, Gabrielsen, & Carpenter, 2018). North America and Australia in particular have been influential in developing wilderness therapy programmes, as well as providing research on these programmes. Despite national cultural differences in the approach to wilderness therapy, the core therapeutic factors appear to be similar. Fernee, Gabrielsen, Andersen, and Mesel (2017) have defined these factors as follows: (1) the wilderness itself, (2) the physical self (i.e. experiencing one's body in relation to the inherent challenges), and (3) the psychosocial self (i.e. the challenging of relational patterns and behaviours). Recent meta-analyses of adventure/wilderness therapy outcomes have reported overall effect sizes of 0.43–0.47 (Bettmann, 2012; Bowen & Neill, 2013). The studied outcomes are clustered and described by Bowen and Neill (2013) as 'change in psychological, behavioural, emotional and interpersonal domains' (p. 42). Bettmann (2012) focused on participants' ability to reduce symptoms of distress related to challenges of interpersonal and mental health. Although these effect sizes technically fit in the small to medium range, in a clinical sense, they are indeed substantial outcomes. In addition, and arguably of equal importance, longitudinal data from outdoor health care treatment has indicated the robustness of outcomes over time (Russell, 2005).

Mixed methods research in wilderness therapy

There are a limited number of studies within the adventure and wilderness therapy sectors that have applied mixed methods in a fairly rigorous manner. Greffrath, Meyer, Strydom, and Ellis (2011) have used a triangulated strategy 'wherein both quantitative and qualitative data were integrated to facilitate a depth of understanding' (p. 347). In this study, two adventure programmes were compared in a crossover design; all participants were exposed to both interventions. Interviews were conducted to allow insight into differences stemming from the quantitative data analysis. Bryson, Feinstein, Spavor, and Kidd (2013) applied a mixed method pre-post design in a feasibility evaluation of an adventure-based therapy provided to individuals with psychosis. Broadly speaking, their interview data contrasted quantitative findings on variables that yielded no significant changes. There were several cases in which the participants described improvements that were not substantiated by the objective data. In a study of an Outward Bound veterans' programme, Harper, Norris, and D'astous (2014) applied what they labelled as a mixed methods evaluation. The quantitative outcomes were compared to the participants' perceived value of the programme, thereby providing multi-faceted insight into the objective changes, as well as their subjective experiences. In a recent mixed methods study of an Australian outdoor adventure intervention offered to youth-at-risk (Bowen & Neill, 2016), the observed effects were mostly small but positive, and the qualitative and quantitative data were usually consistent. The authors concluded that 'the use of semi-structured interviews allowed for further exploration of the participant outcomes and the contributing factors. Such comparisons are recommended for future adventure-based intervention research' (p. 50). Finally, Norton, Tucker, Farnham-Stratton, Borroel, and Pelletier (2017) chose a mixed methods approach to assess the effectiveness of adventure therapy in children surviving, and families affected by, abuse and neglect. Focus group interviews were used to add understanding and nuance to the positive, but mostly non-significant, trends of the low-N quantitative data.

The above studies generally chose outcomes particularly relevant to the target group, and thus it is hard to in a meaningful manner compare the results and the discrepancies that at times emerged between qualitative and quantitative data. Depending on one's point of view this diversity in study outcomes is either a strength or a weakness in much of the adventure and wilderness therapy research.

Friluftsterapi – a Norwegian response to wilderness therapy

Inspired by the wilderness therapy approach, we¹ developed *Friluftsterapi* as a new treatment modality within a Norwegian public mental healthcare setting. After a thorough theoretical conceptualization and meetings with colleagues in the US, Australia and Canada, we adapted several of the core principles of wilderness therapy to the Norwegian culture and health regulations, and we applied our professional ethical guidelines and values (Ferneer, Gabrielsen, Andersen, & Mesel, 2015). This meant that we assimilated the outdoor aspects of wilderness therapy to a Nordic perspective of being in nature, what has been labelled as *friluftsliv*. *Friluftsliv* is a simple outdoor-oriented lifestyle. For many individuals, it holds intrinsic value, while challenging 'the patterns of thought, values and lifestyle imposed by modernity' (Faarlund, 2007, p. 56). In *Friluftsterapi*, the focus is more on the experience of oneself and others in wild places, and it is less focused on facilitating outdoor adventures. There were other consequences of a Nordic adaptation as well. Participation in *Friluftsterapi* had to be completely voluntary, and a client's continued lack of motivation to participate was an exclusion criterion. Along with these therapeutic principles, the client is only partly removed from his or her daily network and activities, therefore, this intervention is an out-patient approach to treating rather severe mental health problems. The definition of *Friluftsterapi* is 'A specialized approach to mental health treatment that combines individual and group-based therapeutic work with basic outdoor life, engaging participants through ecological, physiological and psychological processes' (Gabrielsen, Ferneer, Aasen, & Eskedal, 2016, p.7).

As a new treatment modality in Norway, *Friluftsterapi* invites scrutiny from health professionals, health bureaucrats and fellow national and international researchers, which inevitably brings us to our research question: *What overall inferences can be made about the effectiveness of Friluftsterapi?* Effectiveness, not to be confused with efficacy, is foremost concerned with the interventions' real life capability of producing the desired results (See Ernst & Pittler, 2006). In other word this is a study of the possible benefits associated with participating in the *Friluftsterapi* program.

Methods and procedures

Programme description

The *Friluftsterapi* treatment intervention subject to this study is based on mixed gender and diagnostically heterogeneous groups of approximately eight adolescents 16–18 years of age. These groups were led by interdisciplinary teams of three therapists who also possessed the outdoors skills necessary to accompany their groups into the wild in a safe and attentive manner. The programme consisted of a total of eight single days and two wilderness overnight trips of three and six days, all completed within an eight- to ten-week period. The entire intervention, except for the first introduction day and the closing day, was conducted outdoors. As locations were in the coastal regions of Southern Norway, and the programmes were run in spring or fall, the participants were exposed to a mix of winter- and summer-like conditions typical for these seasons. The programme also aimed to increase the motivation and knowledge of how to engage in wildlife settings. Through individual and group activities, increasingly demanding and complex tasks were introduced. In addition to increasing the participants' general outdoor knowledge, group cohesion was an independently important goal. We covered practical issues, such as dressing effectively, nutrition, navigation, safety, camp routines, etc. There were on-going individual and group therapy

sessions to help process and harness the experiences that participants had during the programme. Working within the concept of closed group therapy, small and large events and incidents were highlighted and used therapeutically. It was crucial that the learning and new insights obtained from *Friluftsterapi* were given transfer value to other aspects of life.

Sample

This study included a total of 32 adolescents (11 boys and 21 girls; mean age at pre-test, 16.5 years; SD 0.57) belonging to four different intervention groups. The first two of these four groups (N = 12) were included in the qualitative part of the study, whilst two more groups helped boost the N needed for the quantitative data collection. All participants were admitted to the specialized mental health care system due to the severity of their mental health challenges. Recruitment was performed through distribution of information folders and by fellow therapists in the department. If the patient was curious and wanted to know more about *Friluftsterapi*, he or she would meet with one of the outdoor therapists. During their talks, they would reach a mutual agreement whether *Friluftsterapi* was something to try as their main treatment modality. Because this programme was a clinical research project, the patient also had to be willing to contribute to the data collection. Frequent diagnoses among the participants were social anxiety, depression, behaviour disturbance, adjustment disorders and mental fatigue. These disorders were typically expressed through symptoms of social withdrawal, low self-esteem, apathy, and reduced self-efficacy. The considerable presence of symptoms and reduced quality of life was evident from the pre-test scores (See Table 1). For instance, an average score of 82.3 on the Youth Outcome Questionnaire (YOQ), where higher scores indicate more symptoms, was considerably higher than the US out-patient norm of 67 (YOQ scoring manual).

The mixed methods research approach

To investigate the overall inferences, in terms of the effectiveness of *Friluftsterapi*, we selected a mixed methods approach. As discussed later in this paper we collected a wide array of data, and by enabling these findings to ‘speak with one another’, we could acquire deeper and more saturated understandings of the effectiveness of *Friluftsterapi*. As this was a complex intervention over a prolonged time period, with a host of likely confounders, we acknowledged that any one single research approach was de facto rendered inadequate.

The mixed methods approach to research is referred to as the *third path* and has ‘emerged as an alternative to the dichotomy of qualitative and quantitative traditions’ (Teddlie & Tashakkori, 2009, p. 4). It is a methodology that utilizes ‘the combination of at least one qualitative and one quantitative

Table 1. The mean score and standard error on the test battery measures, for pre-test (n = 32), post-test (n = 31) and 12 month follow-up (n = 19). Increased scores indicate improvement for all variables, except for YOQ and HADS, for which decreased scores indicate improvement.

	Pre-test M (SD)	Post-test M (SD)	Follow up M (SD)	Cohen’s d effect size pre – post	Cohen’s d effect size pre – follow up	Cohen’s d effect size post – follow up
YOQ	82.3 (37.8)	81.9 (38.8)	66.8 (42.1)	ns	0.39**	0.37*
SOC	48.5 (14.2)	46.7 (14.9)	53.8 (15.0)	ns	0.36*	0.48**
SRH	2.5 (0.8)	2.5 (0.9)	2.7 (0.8)	ns	ns	ns
HADS Anx	11.6 (4.9)	11.1 (5.0)	8.6 (5.3)	ns	0.59***	0.49**
HADS Dep	8.5 (4.3)	9.0 (4.5)	6.8 (4.4)	ns	0.40*	0.49***
SWLS	16.4 (6.4)	15.2 (7.2)	18.4 (8.5)	ns	ns	0.41*
GSE	24.5 (6.4)	25.9 (7.6)	28.4 (6.6)	ns	0.60**	ns
FFMQ	112.7 (17.7)	113.0 (22.9)		ns		
LEQ	4.2 (1.5)	4.4 (1.4)	5.0 (1.0)	ns	0.63***	0.49***

*p < 0.1, **p < 0.05, ***p < 0.01

component in a single research project or program' (Bergman, 2008, p.1). The power of this approach is that it can successfully benefit from the inherent strengths of both quantitative and qualitative research, in terms of addressing multifaceted issues and answering complex and broad research questions.

Initially, we decided that the quantitative and qualitative data collections would be performed around the same time, comprising what is referred to as a concurrent mixed methods design (Zhang & Watanabe-Galloway, 2014). In this approach, the data collected is analysed separately before they are compared, contrasted and combined, allowing for a cross-validation of findings. However, we opted for a sequential approach to data analysis, in which the qualitative results helped us to further explore the findings from the quantitative phase.

Quantitative methods

A quasi-experimental design was chosen that incorporated pre-tests, post-tests and follow up tests. The test battery, which was administered immediately before and after the *Friluftsterapi* intervention and again at 12 months post-treatment, consisted of the following measures: (1) Sense of Coherence Scale, 13 items (SOC-13; Antonovsky, 1993), (2) General Perceived Self-Efficacy Scale, 10 items (GSE; Schwarzer & Jerusalem, 1995), (3) Satisfaction With Life Scale, 5 items (SWLS; Diener, Emmons, Larsen, & Griffin, 1985), (4) Self-rated Health, 1 item (SRH; Bredablik, Meland, & Lydersen, 2008), (5) Hospital Anxiety and Depression Scale, 14 items (HAD; Zigmond & Snaith, 1983), (6) Five Facet Mindfulness Questionnaire,² 39 items (FFMQ; Baer, Hopkins, Krietemeyer, Smith, & Toney, 2006), (7) Life Effectiveness Questionnaire, 24 items (L.E.Q.-H; Neill, Marsh, & Richards, 2003), (8) Youth Outcome Questionnaire, 64 items (Y-OQ-SR 2.0; Wells, Burlingame, & Lambert, 1999), and finally (9) a customized questionnaire labelled 'personal life circumstances', 20 items (gender, age, school attendance, family relations, leisure activities, Internet and media use, future plans, etc.).

Finally, measures of executive functions (digit span and coding) from the Wechsler Adult Intelligence Scale (WAIS IV; Pearson, 2008) were collected pre- and post-intervention.

The test battery, together with the measures of executive functions, was designed to provide a holistic insight into the clients functioning much in line with the meta-analyses by Bettmann (2012) and Bowen and Neill (2013). The Y-OQ-SR 2.0 and L.E.Q are commonly used in US and Australian adventure therapy outcome research respectively, and in addition to being informative, also provide us with comparative data for later use. Furthermore, some tests, inspired by the foci of positive psychology, tap into the individual's resources and perceived quality of life (i.e. GSE, SWLS and SRH), while other tests are more pathological orientated and measure the presence of symptoms (i.e. HAD, in addition to the Y-OQ-SR 2.0 and executive functions). We added the measurements of executive functions as an attempt to bypass the participant's cognitive self-evaluations required by the test battery measures. Thus digit span and coding may indicate changes in subconscious levels of stress and psychological unease. Generally speaking our choice of dependent variables was based on the view that the desired effectiveness of most mental health interventions may be reflected on a wide array of factors in the clients' lives.

The completion of the pre-tests, post-tests and measures of executive functions were all performed in a hospital setting. The 12-month battery of follow-up tests was mailed to the participants. We sent one reminder to the participants who did not return the form.

Qualitative methods

The qualitative inquiry entailed a critical realist exploration (Danermark, Ekström, Jakobsen, & Karlsson, 2002; Maxwell, 2012) of the subjective experiences and perceived outcomes of participation in the *Friluftsterapi* programme. The *Friluftsterapi* treatment process is complex and multifaceted, and a number of factors on many levels may enable or hinder a desirable outcome. The realist investigation seeks to explore and describe these therapeutic processes, where the overall purpose is explanatory rather than judgmental (Pawson, 2013). The qualitative material was derived

from fieldwork and individual interviews. Participant observation took place throughout the first two of the four *Friluftsterapi* interventions, in which the main purposes of the fieldwork were to (1) gain insight into the *Friluftsterapi* treatment process in context and (2) to add nuances and depth to the subsequent data collection and analysis. Two rounds of individual semi-structured interviews were performed with a total of 12 adolescents (five boys and seven girls) from the first two intervention groups. The interviews took place around the same time as the post- and follow-up quantitative data collection.

A critical realist model (Danermark et al., 2002, p. 109–111) was adopted as a guideline for the analysis. The critical realist approach may potentially involve several stages, however this particular analysis was limited to the two first stages of the model, which included: (1) initial description and (2) analytical resolution. The initial description phase started in the concrete and was guided by the question: what is happening? Through repeated readings of field notes and interview transcripts, the treatment process and post-treatment period were explored to obtain general descriptions of the perceived impact of participation in the *Friluftsterapi* programme. In the second stage of the analysis (i.e. analytic resolution), the purpose was to attempt to arrive at explanatory hypothesis, by moving in the direction of 'Why is it, or why is it not, happening?' more specifically exploring the questions derived from the quantitative analysis.

Ethics

The Regional Ethics Committee for the Norwegian South Eastern Health Region formally approved the project (REK no. 2013/1841).

Results

Quantitative results

The quantitative dataset included 32 pre-test batteries, 31 post-test batteries and 19 follow-up test batteries, therefore, 13 respondents dropped out of the study from the pre-test to the follow-up test.

The loss to follow-up prompted us to consider to what degree the follow-up sample was representative of the total sample. We cannot know with certainty. However, we do know that one year after the final day of *Friluftsterapi*, 23 of the 32 participants no longer received any form of specialized mental health treatment, while nine still did. Seven of the nine remaining patients returned the follow-up test battery (i.e. the attrition rate was no lower among patients than non-patients).

Using independent-sample t-tests, we then analysed the mean pre-test and post-test scores on all test battery measures for two groups: (1) those who returned the follow-up data and (2) those who did not. From a total of 22 comparisons, only the WAIS digit span post-test showed a significant difference in favour of the 19 youngsters in the 12-month follow-up sample [25.9 (SD 5.2) vs. 22.2 (SD 1.7) $p < 0.05$]. All 21 remaining comparisons were non-significant, and inspecting the actual group means showed no clear tendency in any direction. Thus, our conclusion is that although our follow-up data suffer from attrition, the above analysis allows for cautious inferences about the long-term robustness and effectiveness of the *Friluftsterapi* intervention. There are no indications that if our follow-up sample consisted of all 32 participants, the results would have differed greatly.

Pre-, post-, and 12-month follow-up. A mixed model analysis for repeated measurements was performed on all test battery measures. Pair-wise comparisons between these pre, post, and follow up tests are shown in [Table 1](#).

Personal life circumstances after 12 months. After reviewing the average self-reported personal life circumstances, all variables improved from the pre-test to the post-test. However, the changes were small, and all paired sample t-tests were non-significant. When performing the same analysis

on the pre-test and follow-up data, there were several significant improvements and no deteriorations (See Table 2).

Executive functions. We analysed the executive functions data using paired sample t-tests (See Table 3). Here we found a significant improvement as measured by Digit Span and Coding from the Wechsler Adult Intelligence Scale (WAIS IV), with mean score improvements of 3.2% and 3.7% respectively.

Summary of quantitative findings. Reviewing the pre- and post-tests, we observed that the average symptom pressure and well-being levels remained statistically the same. The group, as a whole, did not appear to have improved their mental health during the *Friluftsterapi* intervention. The executive functions improvements were significant but small, with 78% of the sample increasing their Digit Span performance, and 86% increasing their Coding performance.

In the 12 month follow-up, we found significant improvements on many of the variables, particularly when compared to the pre-tests, as well as in relation to the post-test.

Looking at the quantitative results in light of our research question, some subjects of interest clearly emerge: (1) What processes may have exerted influence on the post-test data collection? We believed that several clients were experiencing personal distress just as the *Friluftsterapi* intervention ended and the post-data were collected. (2) How was the *Friluftsterapi* experience processed in retrospect? There was a movement towards improved health in the 12 months preceding the follow-up test. (3) What effects do the participants ascribe to their participation in *Friluftsterapi*? To further explore these questions, we shall examine the qualitative material.

Qualitative results

The qualitative exploration centred on the three aforementioned questions that emerged from the quantitative findings, which are presented as: (1) influential processes at the time of the post-test, and (2) post-treatment processing and perceived effects of *Friluftsterapi*.

Table 2. The mean score and standard deviations for the scores on personal life circumstances, for pre-test and 12 month follow-up (n = 19). The items were scored on a 7-point Likert scale ranging from 1 (completely wrong) to 7 (absolutely correct).

	Pre-test M (SD)	Follow-up M (SD)	t-test for group difference	Cohen's d effect size
I am in good physical shape	3.5 (1.3)	4.3 (1.5)	1.86*	0.57
I am happy with my appearance	3.8 (1.7)	4.4 (1.6)	2.07*	0.36
I am an active person	3.3 (1.4)	4.1 (1.8)	1.78*	0.50
I spend much time with friends	3.6 (1.9)	4.5 (1.8)	ns	0.24
I enjoy my spare time	4.1 (1.3)	5.3 (1.5)	4.05***	0.86
I view the future optimistically	3.7 (1.4)	4.5 (1.7)	ns	0.51
I have a good relationship with my family	4.7 (2.1)	5.3 (1.5)	ns	0.33
I know myself well	4.6 (2.2)	5.8 (1.2)	2.88**	0.68
I enjoy being in nature	5.1 (1.6)	5.5 (1.7)	ns	0.24
I do a lot of physical exercise	2.6 (1.7)	3.2 (1.9)	ns	0.33
My future plans are clear	2.9 (2.1)	3.4 (2.3)	ns	0.23

*p < 0.1, **p < 0.05, ***p < 0.01

Table 3. The mean score and standard deviations for the two executive measures from WAIS IV, digit span and coding. Higher scores indicate improved executive functions.

	Pre-tes M (SD)	Post-test M (SD)	t-test for group difference	Cohen's d effect size
Digit Span	22.8 (3.7)	24.2 (4.4)	2.03*	0.32
Coding	67.3 (13.3)	72.8 (12.5)	4.6***	0.43

*p < 0.1, ***p < 0.01

Influential processes at the time of the post-test. The first rounds of qualitative interviews were performed within the first six weeks after the *Friluftsterapi* intervention ended. In terms of the timing of the post data collection, there were several comments from the participants that the therapeutic process was still not concluded, that the intervention was perceived as abruptly ceasing and, furthermore, that any possible changes had not yet manifested in their daily lives. The participants believed that this process could take months or even an entire year, as exemplified by the remark from a female participant:

I am very certain that it takes time before I notice a difference. It can very well be that I notice in a year that I participated, because then I can look back. But right when it is happening, I cannot notice: oh, there was a change! It does not happen like that.

Several of the participants sensed that a change process had been initiated through the multitude of experiences and challenges they had been exposed to over the relatively short time period that the *Friluftsterapi* intervention lasted. However, many still expressed uncertainty regarding the impact of the treatment over time and whether the experience would transfer into real-life changes. For instance, a male participant who was asked whether the *Friluftsterapi* treatment had affected his social anxiety, responded, 'My gut tells me that it did, but my brain does not'. Indeed, many of the adolescents had struggled with depression, anxieties, social isolation, fatigue, and low self-efficacy for months and years, thus, immediate changes as a result of a ten-week intervention was perhaps unrealistic in many incidences; or moreover, the realization and integration of potential change required time and further processing. This presence or absence of early signs of change that had perhaps not fully manifested itself could possibly explain why some individuals were reluctant to report higher scores on the post-test.

Post-treatment processing and perceived effects of Friluftsterapi. Still, during the first round of interviews, a number of participants expressed that the *Friluftsterapi* treatment appeared to be a catalyst that sparked various initiatives upon returning home. This perceived effect took different forms; some participants reported knowing themselves and their own mental and physical limits better, as explained by a female participant:

I learnt that I can handle a lot more than I thought I could ... I did not really know ... I wouldn't have found that limit had I not been on those trips ... It enabled me to break out of just laying around indoors

Such realizations appeared to enable them to more accurately find a reasonable balance in their daily lives. Other examples were accounts of renewed courage to confront the struggles they were faced with and to, for instance, getting up and out of their rooms, despite initial reluctance:

I thought that this [*Friluftsterapi*] would never help me in any way ... I did not want to get up, I just wanted to remain in my bed. Then a while later when I realized that it had actually helped me a little just to have the motivation to get up, I was almost in denial that it had helped me ... Thinking back on it now I know that it was very good for me ... Just that push that enabled me to move on. I needed that!

These tendencies were perceived as empowering and emancipating in terms of gradually re-establishing an increased locus of control or agency in their own lives, which, for some, was also a source of hope and optimism for the future.

At the time of the follow-up interviews many of the adolescents had continued their individual change processes, and they reported a range of minor and major impacts on their daily life functioning. These perceived effects were frequently described as a joint product of the previous participation in *Friluftsterapi*, combined with their own efforts to challenge themselves and working towards establishing a sense of coherence and direction in their lives. For instance, one participant explained that she realized that the *Friluftsterapi* programme could help her change certain things, however, she also needed to make an effort herself for the impact to become even greater. She provided the following explanation:

I became strengthened through *Friluftsterapi*, in terms of doing things that I thought that I would never be able to, and that is what made me able to realize that now I need to do something myself.

A few individuals reported having made progress in therapy following the *Friluftsterapi* treatment, either through individual follow-up in the same hospital department or through other services, such as school nurses or private practitioners. However, among these individuals there were also examples of changes that were initiated in the *Friluftsterapi* context that became building blocks for further progress beyond the programme. Furthermore, during the follow-up interviews the participants were asked to rate the effectiveness of the group intervention for them personally, ranging from 1–10, where one implied no perceived impact of participation, and ten represented a life-changing effect. They were also asked to provide an explanation for the chosen score. The responses ($n = 12$) ranged from 2.5–8.5, with a mean of 5.2 (SD 1.7). Four participants rated the effectiveness between two to four, stating that they did not notice a definite change as a result of the intervention. However, all four considered the *Friluftsterapi* treatment to be a positive experience that gave them memories for life and provided them with knowledge that they could use in their daily lives. They also mentioned that participating in the *Friluftsterapi* treatment was a beneficial contrast from their chaotic and demanding life situations at the time, which helped them to calm down:

I learnt that to just get away from everything every now and then is important in order for me being able to function, so that is actually something that has meant a lot ... And I have learnt to take breaks a lot more since then ... Once I got away from everything I became a lot less stressed and it was wonderful.

The five individuals who rated the effectiveness with a score from five to seven noticed a definite impact on their lives, which they ascribed to the *Friluftsterapi* experience. The outcomes ranged from changes in mindset and cognitive reasoning, increased emotional control, along with improvements of self-image and increased self-confidence in social interaction with peers. One of these participants stated that she herself did not notice any major changes, however that her father had noticed positive impacts on her mood:

My dad says that he thinks I am much happier. He said that he had not seen me this happy since I was in kindergarten...It was at the end of kindergarten that the bullying started, and I was the most miserable person alive...In ninth grade I thought about suicide. Now I don't anymore.

Finally, two individuals rated the impact of the *Friluftsterapi* programme at eight and nine. Both explained that the treatment resulted in major changes in several areas of their lives, for instance, managing to return to school, improved relationships with parents and siblings, and increased mood and energy levels, as well as the ability to make better choices for themselves. One of the participants who had dropped out of school and started to get into trouble prior to participating in the *Friluftsterapi* programme returned to school post-treatment and was also involved in volunteer work in his spare time. He was more invested with his family, for instance spending time with his little brother, ascribing these transformations in his life to the positive experiences related to supporting his peers throughout the *Friluftsterapi* programme:

It [participating in *Friluftsterapi*] helped me to show what I can do for others and, well, just improved my mood, really ... I think back on the ones that I managed to help from crying to laughing ... I have cheered up people before, sort of, but not that many that often ... I realized that I can care more for other people.

The other participant who reported major effects of the treatment notably admitted finding it hard to maintain the positive changes over time. He estimated that the positive impact lasted between four to six months post-treatment. Then, the effect started to decrease. He believed that a follow-up group session every six to 12 months would have helped him to maintain the impact over time by providing a necessary 'boost' for the participants, along with something positive to look forward to and to draw strength and motivation from. Such concrete feedback from the participants provided important information for the evaluation of this first version of the *Friluftsterapi* programme. Based on

the responses from the patients, along with feedback from the therapist teams, a number of implications were elicited that together resulted in major changes to the *Friluftsterapi* intervention and further adjustments to the clinical research. These implications are presented in the conclusion, however, we shall first discuss the results of this mixed methods evaluation.

Discussions

It may seem unorthodox that we start our discussion by questioning the validity of the quantitative post-test data. The answer to this question will affect how our results are interpreted when attempting to answer the research question. The interviews revealed that when the post-tests were administered, shortly following the final day of *Friluftsterapi*, several participants were still in the midst of what they described as demanding psychological processes. The *Friluftsterapi* intervention had sparked personal crises that were still ongoing at the time of the post intervention data collection. In the personal journey towards recovery a patient might undergo temporary mental health setback, which also appeared to be the case with some of the participants in this study – their ongoing struggles became evident through considerable deteriorations from the pre-test to the post-test. There were also participants who expressed sadness and even anger that the *Friluftsterapi* experience had come to an end, which also may have been reflected in the post-test scores. In short, the post-tests are valid as a cross-sectional dataset, however, as post-test data per se, we have reason to believe that these were administered too soon, as the objectives of the treatment process at that point in time were not fulfilled for all participants. Stated differently, the post data was in fact post *Friluftsterapi* intervention data but not necessarily post *recovery/treatment* data. Thus, in terms of our qualitative data, we ask that the reader keep this detail in mind as the discussion continues.

Statistically, we observed no differences between the pre-test and post-test scores, with the exception of improvements in the two executive functions. These results indicated that the participants' here-and-now stress and anxiety levels were reduced but that the quantitative self-evaluation of overall health had not changed. This finding may coincide with the general feedback from clients reporting that the experiences and benefits from the intervention at this point in time was not processed and grounded (i.e. my gut tells me that it did, but my brain does not...), however, it appeared to have sparked new initiatives, that over time might lead to a more congruent and confident manner of leading their lives.

The overall direction of the 12 month follow-up data is towards recovery, and there are no variables, including the non-significant ones, that indicate a deterioration of the patients' mental health. The average effect size on the test battery variables that turned out statistically significant was 0.50. For the personal evaluation variables, the average effect size was 0.59 for significant variables and 0.44 for all variables. Improvement on the Life Effectiveness Questionnaire (LEQ) was the strongest of all psychometric variables, with an effect size of 0.63. The LEQ measures 'a person's capacity to adapt, survive and thrive' (www.wilderdom.com). Likewise, 'I enjoy my spare time' was the personal evaluation statement that yielded largest change in the client group with an effect size of 0.86. From the above data, it seems reasonable to conclude that many participants mastered and enjoyed life more one year following *Friluftsterapi* compared to at the onset of the intervention. These findings are echoed in the interviews, in which many of the adolescents described a gradual but general increase in their emotional awareness, locus of control, and self-confidence in their social interaction with others. Rather than being limited by their mental health challenges and remaining socially isolated, many managed to take one or several steps towards regaining a direction in life by, for instance, returning to school and reconnecting with their families and network.

When inspecting group averages one might assume that few of the participants had experienced beneficial processes at the time of the post-test administration. However, a closer look at the interview material reveals that such a conclusion may be too hasty. In the interviews, there was a consensus among many clients that at time points close to the post-tests, a sense of empowerment

had already started to emerge. Statements that implied renewed courage and increased insight indicated that, for several clients, a recovery process was indeed underway. Changes for many participants were manifested in psychometric data on *actual* symptoms, while psychometric data on *subjective* health had yet to 'catch up' to these trends. For instance, on the YOQ, which measures a range of symptoms of ill-health, 69% of the participants reported fewer and weaker symptoms at the post-test compared to the pre-test, and 31% reported an increased level of symptoms. Furthermore, most reductions in symptoms were at this point moderate (e.g. 62–52 and 100–84), while a few increases in symptoms were quite large (e.g. 112–148 and 49–101). As previously mentioned, the latter likely indicated that these clients were in the midst of serious crisis, likely induced, but not yet settled, by the *Friluftsterapi* intervention. These crises may either be due to ongoing recovery processes or due to the experience of *Friluftsterapi* as non-beneficial or even as counterproductive to one's health. Although few in number, these large deteriorations in health had a considerable impact on the group average results.

A discussion of inter-client variance

As previously shown, there was a considerable inter-client variance, particularly when it came to the pre-post data. Some participants experienced improved health immediately following the intervention, while others did not. Due to our moderate sample size, we lacked the statistical power to perform meaningful analysis to describe the group that appeared to benefit from *Friluftsterapi* versus the group reporting deterioration. Still, performing simple algebra on individual intake symptom pressure and their subsequent post-test outcomes, we are unable to predict the outcomes from the pre-test scores alone. This surprised us somewhat, as heuristic feedback from several therapists indicated that *Friluftsterapi* appeared to have the strongest impact on those patients who seemed to be least plagued by their mental health challenges. In our efforts to re-interpret these observations, we cautiously suggest that those clients that are 'happiest' being in an outdoor treatment programme are those who are likely to benefit most from it – regardless of their level of mental health challenges. If this inference holds water, then the selection process ahead of *Friluftsterapi* emerges as crucially important, and perhaps client expectations must be better aligned with the reality of the programme, including emphasizing that there will be socially demanding situations, experiences of physical fatigue, discomfort of wet shoes and heavy backpacks and so on.

Strengths and limitations

The primary strength of this study was having access to a wide spectre of data to help illuminate the research question. Any one of the utilized methodologies would have considerable shortcomings alone, however, paired with complementary data, our prerequisite for understanding the possible effectiveness of *Friluftsterapi* increased and became more nuanced. Furthermore, the ecological validity was strengthened as different therapist teams performed the interventions across four clinical groups in different locations, and during different times of the year. This project was a real-life study, not an experiment. Still, the internal validity is limited and causal conclusions cannot be made. For instance this study has no comparison groups and earlier attempts at performing randomized controlled trials as part of our research was abandoned due to methodological and ethical reasons (see Gabrielsen et al., 2016).

The primary limitation is no doubt the considerable attrition rate from post-test to the follow-up test one year later. Even though we have not been able to discover the core differences between the remaining sample and the drop-out group, we must assume that these exist, and as such, act as confounders to our findings. Hence, all general conclusions concerning the total sample must be read with this serious limitation in mind. In addition, a larger sample would open up for multivariate statistics, and, thus, richer descriptions of the sub-groups in the sample. However, as is the

case with much of the clinical adventure therapy research, interventions studied are complex, time-consuming and expensive, which unfortunately but invariably often results in few participants in these studies.

Clinical implications and concluding remarks

This paper presents research results from the clinical intervention *Friluftsterapi*. As the first of its kind in Norway, the results are particularly useful to illuminate the strengths and weaknesses of both the clinical intervention and the research design. The project group has been, and still is, committed to the complete transparency of all processes in our work. Therefore, these results are interpreted with the intent to determine whether we are ‘on the right path’ to something that may become potentially good, rather than a final documentation on the potential effectiveness of this intervention.

A concrete implication of this initial stage of the clinical research project is that the experiences from the *Friluftsterapi* treatment programme and accompanying research have resulted in a new and hopefully improved clinical research project, imaginatively labelled *Friluftsterapi 2.0*. Table 4 illustrates some primary differences between the first version and the extended quest towards establishing an efficacious wilderness therapy programme in adolescent mental health care in southern Norway.

In conclusion, revisiting the overall research question of this mixed methods evaluation – what overall inferences can be made about the effectiveness of *Friluftsterapi* – and bearing in mind the aforementioned limitations, we respond with the following statements:

- The *Friluftsterapi* experience appears to have contributed towards improving the mental health and the daily life functioning of most participants. The one-year effect sizes matched the suggested benchmark of 0.5 for adventure therapy programmes (Bowen & Neill, 2013).³
- The participation in *Friluftsterapi* is viewed by clients as a valuable experience in and of itself.

Table 4. Clinical and research design differences between *Friluftsterapi* and *Friluftsterapi 2.0*.

	<i>Friluftsterapi</i>	<i>Friluftsterapi 2.0</i>
Selection	Focus on client motivation	Focus on client motivation and ability
Dosage and intensity	18 days over an 8- to 10-week period	10 ½ days over a 3-week period
Structure	High degree of structure with pre-specified daily programmes composed of many different elements	Low degree of structure, allowing for freer daily programmes that typically include less elements
Therapeutic factors	Wilderness, physical self and psychosocial self. Accessed through adventurous activities, individual and group therapy	Wilderness, physical self and psychosocial self. Accessed through introspective and experiential activities, and individual and group therapy
Main expedition	6 days/5 nights in semi-wilderness on a pre-defined route from A to B	7 days/6 nights in wilderness without a pre-defined route. The group returns to the starting point
Quantitative data collection	Voluminous test-battery - Pre-test - Post-test - 12 month follow-up test - Day-to-day clinical measurements - HRV & executive functions	Condensed test-battery - Pre-test - Post-test - Discharge from the treatment test - 12 month follow-up test - Day-to-day clinical measurements
Qualitative data collection	- Extensive participant observation - Individual interviews with adolescents and parents at post-test and at 10-month follow-up. - Topics: perceived outcome in relation to the context and therapeutic mechanisms	- Limited participant observation - Individual interviews with adolescents at post-test and 12-month follow-up - Focus group interviews at 3 month follow-up - Topics: Perceived outcome in relation to context and therapeutic mechanisms; specific experiences

- The benefits of *Friluftsterapi* are potentially numerous, however, often not immediately apparent to the client. Thus, distance in time affects the perception of both the intervention itself and its possible outcomes.

Finally, wilderness therapy interventions come in numerous shapes and forms and are definitely complex phenomena to study. However, the mixed methods approach provides insight that easily could have remained obscured if the data were not allowed to 'communicate'. We certainly do not have all the answers; however, as our knowledge expands, old questions in the wilderness therapy field emerge in renewed forms: Which clients should form a group? What is the optimal dosage and intensity? How should the return to everyday life be planned? What are the early markers of whether a client will benefit from the intervention? What are the key therapist qualities? This clinical research project will continue for years, gradually refining, exploring and re-evaluating the intervention and various factors of the treatment process to illuminate even more aspects of what occurs in the wild.

Notes

1. The Department of Child and Adolescent Mental Health at Sorlandet Hospital Health Enterprise, Norway.
2. Pre- and post-test only.
3. Bowen & Neill reported Hedges' g in their meta-analysis, while this study reports Cohens' d . These effect sizes are similar in most cases (Cooper & Hedges, 1994).

Disclosure statement

No potential conflict of interest was reported by the authors.

Funding

This work was supported by the The Sørlandet Knowledge Foundation [Does not exist];

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