



Individual level predictors of implementation climate in child welfare services



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ABSTRACT

Background: Child welfare services (CWS) are characterized by having demanding work environments, large diversity in client needs, and limited use of evidence-based practices (EBPs). Thus, CWSs can benefit from quality improvement strategies. Accumulating evidence suggests that an organization's strategic climate towards implementation of change and EBPs (i.e., Implementation Climate [IC]) is a critical determinant for quality improvement, such as implementation of EBPs. It is also important to understand how practitioner characteristics are implicated in successful implementation. Knowledge about how practitioner characteristics predict IC can inform priorities, improvements, and processes at several levels of CWSs to promote successful EBP implementation and sustainment.

Methods: We collected data on IC, job satisfaction, job stress, participation in implementation, and practitioner demographics from a total of 233 participants employed in three Norwegian CWSs during a hybrid trial investigating the implementation and effectiveness of an academic intervention (Enhanced Academic Support) for children and families receiving support from CWSs. Data were collected at two time points; before initial implementation and 20–24 months after initial implementation. We ran confirmatory factor analyses to test the factor structures and intercorrelations of translated measures. We compared Implementation Climate Scale scores with a study using the same scale in United States-based CWSs. Hierarchical multiple regression analysis was used to test whether job stress, job satisfaction, practitioner tenure, postgraduate education, and whether respondents were active or inactive participants in an ongoing implementation process predicted IC.

Results: Measures of IC exhibited acceptable psychometric properties. Significant differences between IC in Norwegian and United States-based CWSs were found for three subscales (educational support-, recognition-, and rewards for EBPs). Composite scores did not differ significantly. Job satisfaction was the strongest and only unique predictor of IC at both time points. Length of tenure was a unique predictor at T2.

Discussion: To improve the climate for implementation in CWSs, strategies should address the job characteristics and demands that can increase job satisfaction and reduce high levels of job stress. Job satisfaction and tenure may inform strategic priorities and role selection in implementation processes. Differences in the work-culture between Norwegian and United States-based CWSs may produce different interpretations of certain items in the Implementation Climate Scale.

Abbreviations: CFA, Confirmatory Factor Analysis; CFI, Comparative Fit Index; CI, Confidence Interval; CWS, Child Welfare Service; EAS, Enhanced Academic Support; EBP, Evidence-Based Practice; EBPs, Evidence-Based Practices; IC, Implementation Climate; ICS, Implementation Climate Scale; KMO, Kaiser Meyer Olkin test for sampling adequacy; PCA, Principal Component Analysis; RCT, Randomized Controlled Trial; RMSEA, Root Mean Square Error of Approximation

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1. Introduction

Child Welfare Services (CWSs) vary greatly in the services and practices they offer to children and families. The effectiveness of their practices is often unknown, evidence-based practices (EBPs) are scarcely used (Christiansen, 2015), and implementation of EBPs in general often fail to be sustained as intended (Hall, Staiger, Simpson, Best, & Lubman, 2016; Stirman et al., 2012). These shortcomings likely have several complex explanations, and studying implementation processes can help shed light on how and why implementation succeeds or fail. Implementation refers to the act of carrying an intention of change into effect (Theobald et al., 2018) and implementation research is defined as “the scientific study of the use of strategies to adopt and integrate evidence-based health interventions into clinical and community settings” (National Institutes of Health, 2019). Attending to organizational and individual *implementation determinants* (i.e. factors that are believed or empirically shown to influence implementation outcomes, Nilsen & Bernhardsson, 2019) before or alongside implementation of practices likely increases chances of sustained implementation success (Aarons et al., 2016). Implementation determinants may be of special importance in CWSs, where implementation processes can be particularly demanding due to challenging contextual characteristics (Aarons & Palinkas, 2007). In this study, we investigate an empirically supported implementation determinant; implementation climate, which refers to an organization's strategic climate towards implementation of EBPs, and whether implementation climate is predicted by level of job stress and job satisfaction among practitioners, their participation in implementation, and by demographics.

1.1. Child welfare services

CWSs work to ensure safety, stability, wellbeing, and a healthy upbringing for children. The vast majority (approx. 70%) of CWS in Norway is delivered by municipal agencies located across the country (Statistics Norway (SSB), 2016). The term CWS is here used as a translation of the Norwegian term 'Barnevernet', which in some countries would be translated to CWS and in others as Child Protection Services. In Norway, the Child Welfare system has the combined function of both helping children and families through compensatory welfare services and protecting children through out of home care placement. Thus, the responsibilities of front-line practitioners in CWSs span from investigating abuse and neglect, delivering family, parent, or child counseling, out of home care placement and support, to offering compensational measures such as parent relief and financial support (Christiansen, 2015). This combined function is a common characteristic of Nordic welfare systems. However, other countries such as United States, United Kingdom, and Canada are more oriented towards child protection (Gilbert, Parton, & Skivenes, 2011). Additionally, Norway has adopted a child-centric orientation where the safety, wellbeing, and rights of children outweigh other considerations such as family preservation. In Norway, as in other countries, CWSs vary considerably in organizational structure (McCrae, Scannapieco, Leake, Potter, & Menefee, 2014; Gilbert et al., 2011), workload capacity (Edwards & Wildeman, 2018), and in available services and practices delivered (Christiansen, 2015). The Norwegian child welfare system is under constant scrutiny. Government directives, negative media attention, and accumulation of legal actions against CWSs place mounting pressure on the CWSs and their staff. For CWSs to ensure safe, just, caring, and effective services, it will likely include improvements of organizational structures, routines, and quality assurance systems, as well as increased adoption of evidence-based practices (i.e. practices based on the best available evidence integrated with practice expertise and client needs and preferences, Palinkas, 2018). Such change efforts are challenging even for highly well-functioning organizations (Decker et al., 2012). CWSs, however, are often burdened with high caseloads, scarce resources, and high levels of staff turnover (Edwards &

Wildeman, 2018; Ryan, Garnier, Zyphur, & Zhai, 2006; Strolin-Goltzman, Kollar, & Trinkle, 2010). CWS practitioners experience high job demands, stressful and emotionally challenging work and work environments, and are prone to stress and burnout (Chung & Choo, 2019; Travis, Lizano, & Mor Barak, 2016). Such high levels of job stress are likely unfavorable to CWSs molar organizational climate (i.e. staffs' shared perceptions of the influence of the work environment on their wellbeing at work, James et al., 2008), which has in turn been shown to affect general wellbeing and health, quality of services, and client outcomes (Glisson & Green, 2011; Griffiths, Royse, & Walker, 2018; Lawrence, Zeitlin, Auerbach, & Claiborne, 2015). CWSs could benefit from enhancing their systematic quality improvement efforts and implementation of evidence-based practices (EBPs). However, a challenging organizational climate, as described above, likely harms implementation determinants such as IC (Williams & Beidas, 2019).

1.2. Implementation climate

Implementation Climate (IC) refers to practitioners' shared perceptions of the extent to which their organization expects, supports, and rewards the use of EBP or specific innovations (Ehrhart, Aarons, & Farahnak, 2014; Klein & Sorra, 1996). These perceptions form when practitioners experience and interpret cues in their work environment through policies, procedures, practices, and communication from leaders and managers (Weiner, Belden, Bergmire, & Johnston, 2011). For instance, IC theory posits that an organization that hires, trains, incentivizes, advocates, and removes barriers for innovations being implemented are more likely to have a positive IC (Klein & Sorra, 1996). Considerable attention has been given to IC in implementation theory (Klein & Sorra, 1996; Moullin, Dickson, Stadnick, Rabin, & Aarons, 2019; Weiner et al., 2011). However, empirical studies on IC have been lagging behind its theoretical implications (Jacobs, Weiner, & Bunger, 2014). Some recent cross-sectional studies have linked higher IC scores to increased adoption of EBPs among practitioners in behavioral health organizations (Williams, Ehrhart, Aarons, Marcus, & Beidas, 2018) and community pharmacies (Turner et al., 2018). Powell and colleagues (2017) reported from their study in child service agencies that IC was linked to more positive attitudes towards EBPs and more knowledge about EBPs among practitioners (Powell et al., 2017), though not adoption of EBPs per se. In a school-based intervention for children with autism, IC interacted with intervention fidelity in predicting intervention outcomes. That is, better student outcomes were registered when scores on both IC and fidelity were high (Kratz et al., 2018). Jacobs and colleagues (2015) found that perceptions of implementation climate among physicians positively predicted implementation effectiveness, defined as the number of patients each physician enrolled in cancer clinical trials. In summary, IC is believed to be an important factor in predicting adoption of EBPs and emergent empirical work supports this association. CWSs likely need to attend to the level of IC in their organizations to succeed with quality improvements and implementation of EBPs. To our knowledge, no prior studies have measured IC in CWSs outside of the United States, and it is uncertain whether existing observations generalize to CWSs outside of United States, such as in Norway. There is a need for studies of cross-national generalizability of IC.

IC is also a modifiable construct that can be targeted through intervention to promote an organization's ability to implement change and EBPs (Klein & Sorra, 1996; Turner et al., 2018). To enable precise and effective employment of strategies for modifying IC, implementation science and practice would benefit from understanding more about factors that promote and inhibit such processes. Several factors at multiple levels of the CWSs may influence IC, and considerable attention has been given to the role of leadership (Aarons, Ehrhart, Farahnak, & Sklar, 2014; Guerrero, Fenwick, & Kong, 2017). Little is known, however, about practitioner characteristics and associations with IC. Practitioners are the users of EBPs, and the purpose of an IC is

to support, reward, and expect practitioners to use EBPs. Thus, practitioners are key sources of information in learning how IC can serve this purpose. Knowledge about practitioner characteristics as predictors of IC can, for instance, inform staff selection, organizational interventions, training needs, role assignment in implementation (e.g. active versus passive participation), priorities, and differential targeting of implementation strategies and support. Moreover, knowledge about predictors of IC can facilitate more precise explanations of why implementation processes succeed or fail. Studies on practitioner characteristics as individual-level predictors of IC are scarce and, to our knowledge, non-existent in the context of CWSs.

There are, however, empirical studies on associations between different practitioner characteristics and organizational determinants that share similarities with IC in other contexts. For instance, a review of 94 studies of organizations from different sectors (e.g., health care, industry, finance, government, education) in the United States pointed to associations between practitioner perceptions of organizational climate and practitioner characteristics such as work attitudes, job satisfaction and job performance (Parker et al., 2003). A review of 21 health care organizations found associations between organizational climate defined as perceptions of social and interpersonal aspects of the work situation, and practitioner wellbeing factors such as burnout, distress, and mental health (Bronkhorst, Tummers, Steijn, & Vijverberg, 2015). Taken together, these reviews suggest individual work-related wellbeing factors of practitioners such as job stress and job satisfaction could contribute to shaping an organizations' IC.

1.3. Individual-level predictors of implementation climate

1.3.1. Job stress

Job stress is theorized to occur when practitioners experience job requirements that exceed personal and social resources and capabilities, and excessive job stress can lead to burnout (Bakker, Demerouti, & Euwema, 2005; Boyas & Wind, 2010). The high prevalence of job stress in CWSs and its negative effects on wellbeing are well documented in the literature (Lizano, 2015). A study in CWSs found practitioners' job stress to be a significant inhibitor of implementation buy-in (attitudes and beliefs about innovation need and appropriateness, McCrae et al., 2014), a construct similar to IC. Job stress has been associated with staff turnover, job satisfaction, burnout, and physical- and mental health issues (Boyas & Wind, 2010; Griffiths et al., 2018; Kim, 2011; Regehr, Leslie, Howe, & Chau, 2000; Sauter, Murphy, Colligan, Swanson, Hurrell, & Scharf, 1999). There are limited studies, however, on how job stress affects IC. A study of research- and development teams in China found high job stress among staff to decrease the positive association between organizational innovation climate and successful implementation (Ren & Zhang, 2015), suggesting job stress as a potential moderator of the relationship between organizational climates (e.g., molar organizational climate and IC) and implementation. A frequent antecedent of job stress and burnout is excessive workload or time-constraints (Maslach, Schaufeli, & Leiter, 2001; Regehr et al., 2000), and studies from CWSs have indicated excessive workload as an important barrier to implementation (Burns & MacCarthy, 2012; Johnson & Hastings, 2002; Oliver & Lang, 2018), and thus a likely predictor of implementation climate as well. Work-related stress is, however, not categorically negative. An individually appropriate level of stress can improve job performance and job satisfaction (Nelson & Simmons, 2003). A study from CWSs in the United States found stressful work climates to be related to improved outcomes for children and youth (Williams & Glisson, 2014). The authors suggested that the complex demands of child welfare practice, and the energy and efforts needed to improve outcomes, will inevitably cause practitioners to experience a stressful work environment when they go the distance.

1.3.2. Job satisfaction

Job stress is related to a perhaps more decisive factor of wellbeing at

work; job satisfaction (Chung & Chun, 2015; Maslach et al., 2001), which is also a potential predictor of IC. While job stress refers to a depletion of personal resources, job satisfaction can be understood as "the extent to which work is a source of need fulfillment and contentment" (Maslach et al., 2001, p 416). Most implementation studies investigating job satisfaction have looked at how implementation processes or determinants influence job satisfaction (Kinjerski & Skrypnik, 2008; Lawrence et al., 2015; Maier, Laumer, Eckhardt, & Weitzel, 2013; Melnyk et al., 2010), and not vice versa. However, a study of United States-based CWSs found job satisfaction, and particularly satisfaction with work communication, to predict *readiness for change* (an organization's abilities and willingness to implement an innovation, Scaccia et al., 2015; Claiborne, Auerbach, Lawrence, & Schudrich, 2013); an organizational level construct similar to IC. Similarly, a study with mental health nurses in the UK found job satisfaction to be associated with perceptions of barriers to implementing change (Laker et al., 2014). A systematic review of nurses' utilization of research in practice found positive associations between job satisfaction and general research utilization (Squires, Estabrooks, Gustavsson, & Wallin, 2011), which to some extent speaks to job satisfaction as an implementation determinant because implementation in some form likely precedes research utilization. In their study of change management, Johnson and McIntyre (1998) emphasized that targeted improvements in organizational climate could increase job satisfaction and, in turn, organizational effectiveness. These relationships, however, could be reciprocal in that job satisfaction may function as an antecedent to climate factors that promote organizational effectiveness as well. For instance, more satisfied practitioners may be more likely to exhibit implementation citizenship behavior (i.e., individual behaviors towards other individuals and/or the organization that supports implementation beyond what is expected, Ehrhart, Aarons, & Farahnak, 2015), which would likely improve IC. If so, job satisfaction would be an important target for intervention as well to improve IC and subsequent implementation.

1.3.3. Active participation in implementation

In addition to job stress and job satisfaction, studies in change management have identified active participation in the change initiative as influencing readiness for change (Cunningham et al., 2002; Oreg, Vakola, & Armenakis, 2011; Vakola, 2014; Wanberg & Banas, 2000). A Norwegian study found that mental health practitioners who were active participants in an implementation process reported more favorable intentions towards use of the intervention compared to passive participants (Egeland, Ruud, Ogden, Lindström, & Heiervang, 2016). A practitioner being empowered as an active participant in an implementation process might appeal more to intrinsic motivation for implementation, compared to not being involved, which could, in turn, affect how the practitioner perceives IC.

1.3.4. Tenure and post-graduate education

The practitioner's tenure and post-graduate education may also predict perceptions of IC. Among mental health and health care practitioners, longer tenure and more education have been associated with less positive attitudes towards EBPs both in Norway (Egeland et al., 2016), Greece (Melas, Zampetakis, Dimopoulou, & Moustakis, 2012), and the United States (Aarons et al., 2012). Discussions suggest that growing confidence in one's competence, which may come with years of experience, decreases practitioners' perceived interest in, and need for, innovations and new practices (Egeland et al., 2016). Conversely, a study in CWSs in the United States found tenure to be positively associated with readiness for change (Claiborne et al., 2013), adding to the uncertainty of how tenure is associated with implementation determinants.

On the other hand, more education may increase competence and self-efficacy, which has been linked to increased readiness for change theoretically (Holt, Armenakis, Harris, & Feild, 2007; Vakola, 2013) and empirically (Oreg et al., 2011). This contrasts with the association

between education level and attitudes towards EBPs mentioned above, showing there are divergent results from different determinants. Moreover, practitioners seeking more post-graduate education might report more change-friendly attitudes. It is uncertain, however, how practitioner characteristics associated with attitudes towards EBPs and readiness for change would also be associated with an organizational level determinant of implementation such as IC.

2. Present study

This study investigated two practitioner factors related to wellbeing at work (job satisfaction and job stress), two demographic factors (length of tenure and post-graduate education), and whether practitioners were active participants in an implementation process as predictors of IC in four Norwegian CWSs. The psychometric properties of the Norwegian translation of the Implementation Climate Scale (ICS, Ehrhart et al., 2014) were also assessed. ICS scores from Norwegian CWSs were compared with scores from a study of United States-based CWSs to compare scores, explore cross-national generalizability, and inform further use of the Norwegian Translation of ICS. Based on results from studies of similar individual-level constructs (e.g. attitudes towards EBPs), we hypothesized that practitioners who are more satisfied with their work and experience less job stress perceive their CWSs IC as more favorable compared to practitioners who are less satisfied and more stressed. We also hypothesized that practitioners having longer tenure, post-graduate education, and who were not an active participant in the implementation would perceive the IC in their organization to be less favorable compared to those with less experience, without post-graduate education, or who were active participants in the implementation process.

3. Method

The present study is part of a randomized controlled trial (RCT) of Enhanced Academic Support (EAS), an academic support intervention in Norwegian CWSs (Engell, Follestad, Andersen, & Hagen, 2018). EAS is a co-designed academic intervention where CWS practitioners use flexible common elements-based practices to help children and families with academics at home. Core elements of EAS include parent training in parental school involvement and positive reinforcement, guidance in appropriate homework structure and routines, and structured tutoring in reading and math (Engell et al., 2020).

Data are collected from participating child welfare services (CWSs) at two time points. One CWS was located in a small urban area with a population ranging from low- to high socioeconomic status (SES), another was located in a dense urban area with a predominantly low- to medium SES population and above-average percentage of ethnic minorities, and the third and fourth in a suburban area with a medium to high SES population. The T1 data collection was conducted during the spring of 2017, before implementation of EAS. The T2 data collection was conducted approximately 20–24 months after T1, well into the implementation.

3.1. Participants

At T1, participants were 129 child welfare practitioners. At T2, participants were 157 child welfare practitioners. Due in part to turnover and hiring of new practitioners during the period from T1 to T2, only about a third ($n = 51$) of the respondents participated at both data collections. We, therefore, decided to treat T1 and T2 as two different samples. The response rate at T1 was 58%. We were unable to determine whether emails sent to 27 email addresses at T2 were received by respondents due to turnover during the period respondents were sent the emails. With the 27 uncertainties included, the response rate at T2 was 68%. Without the 27 included, the response rate at T2 was 77%. The four participating CWS were all located in southeastern Norway

and varied in size from small to large by Norwegian standards as measured by catchment area and number of practitioners. The four services employ 121 (regional mean = 32), 73 (regional mean = 24), 43 (regional mean = 47), and 15 (regional mean = 47) full-time equivalents and serve child populations aged 0–18 years. The smallest CWS only participated at T1 due to withdrawal from the RCT before T2. At both time points, the female-to-male ratio among respondents was approximately 9:1, a gender distribution that is common in child welfare and social work in Norway (85% women in child welfare in 2011, SSB 2016) and the United States (Griffiths et al., 2018; Kim, 2011). The mean age of the respondents was 41 years ($SD = 10.29$) at T1 (range 23–67) and 43 years ($SD = 11.35$) at T2 (range 22–67). The majority of respondents reported having had some post-graduate training at both T1 (66%) and T2 (71%). The majority of the respondents held the position of caseworker (63% and 57% at T1 and T2, respectively), 20% were family therapists, and approximately 10% were either directors or managers at different levels within the CWS.

The educational background of the respondents was predominately focused on child welfare (46% at T1, 45% at T2) or social work (31% at T1, 41% T2). The remaining respondents held degrees in psychology, nursing, education, or other related disciplines. At T1, 34% of the respondents were active participants in the implementation of EAS (defined below), whereas at T2, active participants comprised 14% of the sample. Having an active role in the implementation of EAS meant that the participant either was trained in delivering EAS, had participated in the development of EAS, or had been selected to oversee and support the implementation process in the CWS. Passive participants were practitioners in the experimental comparison group in the RCT, practitioners who recruited families to the RCT, and practitioners who had no defined role in either the RCT or implementation but who were colleagues of practitioners with defined roles. The percentage of respondents from each site corresponded to the size of the CWS. For example, the largest site made up 41% and 52% of the participants at T1 and T2, respectively. See table 1 for details.

3.2. Measures

3.2.1. Background and demographic information

Participants answered questions about their demographics and other background information, such as type of current position in the CWS, length and type of education, and whether they had post-graduate training. Typical post-graduate training includes a master's degree in child welfare or social work, specialist education in child mental health, and certified courses in specific interventions and practices. We also asked participants to indicate how long they had worked in the child welfare services.

Table 1
Demographic and background information of participants.

Characteristic	T1	T2
N	129	157
Mean age (<i>SD</i>)	40.98 (10.29)	42.71 (11.35)
Gender (% female)	90.7	89.9
Tenure in child welfare (%)		
0–1 yrs	9.3	7.6
1–3 yrs	18.6	14.0
3–7 yrs	34.9	24.2
7–10 yrs	10.1	19.1
> 10 yrs	27.1	35.0
% from each CWS site		
Site 1	41.3	51.9
Site 2	32.6	33.5
Site 3	24.0	14.6
Site 4	2.1	Dropped out
% child welfare education	46	45
% social work education	31	41

3.2.2. Implementation climate scale

Organizational climate for implementing evidence-based practice was assessed using the Norwegian translation of The Implementation Climate Scale (ICS, Ehrhart et al., 2014). The scale consists of 18 items rated on a five-point scale (ranging from 'not at all' to 'a great extent'). Higher scores indicate an organizational climate more conducive to implementing evidence-based practices. The scale translated for this study refers to evidence-based practice (EBP) as making decisions based on the best available evidence integrated with practice expertise and client needs and preferences, and the act of carrying out those decisions in the form of interventions as evidence-based practices (EBPs). The scale has six subscales consisting of a) focus on EBP, b) educational support for EBP, c) recognition for EBP, d) rewards for EBP, e) selection (employment) for EBP, and f) selection (employment) for openness. Sample items are: 'The use of evidence-based practice is a priority in this service' and 'This service hires people who are experienced in the use of evidence-based practice'. The ICS has been validated with practitioners in 32 mental health organizations and 12 child welfare services in the US (Ehrhart et al., 2014, 2016). To our knowledge, ICS has not previously been administered to child welfare workers in Norway. The first author, whose primary language is Norwegian and who is close to fluent in English and familiar with implementation terminology, translated the scale to Norwegian. The last author, who is fluent in Norwegian and English, translated the scale back to English without reviewing the original scale. The back-translation was sent to the scale developers (third author and colleagues) for reviewing discrepancies and inadequate expressions. Two discrepancies in the use of terms were identified and resolved through conferring with expert colleagues. The Norwegian translation underwent pre-testing with CWS practitioners ($N = 9$) before being finalized. [Supplementary file 1](#) provides documentation of the initial forward version, back-translation, a summary of identified discrepancies, discussions, and suggested modifications, and final version. In the present study, the ICS was administered to all practitioners at three CWS sites at both time points, and at T1 for the CWS who withdrew from the study before T2. The overall reliability alpha was $\alpha = 0.87$ at T1 and $\alpha = 0.88$ at T2. The subscales' reliability alphas ranged from 0.52 to 0.88 at T1 and 0.61 to 0.93 at T2. The subscale measuring rewards for EBPs had the low alpha of 0.52 at T1 and 0.61 at T2. We ran confirmatory analyses (CFA) of the ICS with each of the subscales as indicators of the general IC-construct at each time point to test its factorial structure in our samples. The results supported its use (see results section).

3.2.3. Job stress index

A job stress index was computed using items from a questionnaire measuring individual- and organizational aspects of the CWSs developed for this study. The full questionnaire consisted of 32 items rated on a five-point scale (ranging from 'strongly disagree', to 'strongly agree') and targeted characteristics of both the organization and of the respondent him- or herself, such as quality assurance, openness to change, adaptability, job functionality, job stress, job satisfaction, and training needs. Principal components analysis and exploratory factor analysis using the T1 sample supported a scale of the following five items: 'In this agency, we often show signs of stress and hardship', 'In this agency, we have a workload that prevents our efficiency', 'In this agency, we experience a lot of frustration among staff', 'In this agency, we are able to spend enough time with our clients (reversed)', and 'My large workload prevents me from doing my job effectively'. We ran CFAs using the T2 sample and the results supported its use, see results. The reliability alphas of the job stress scale were acceptable ($\alpha = 0.80$ at T1 and $\alpha = 0.69$ at T2).

3.2.4. Job satisfaction index

A job satisfaction index was computed using items from the same questionnaire based on content validity judged by the first and third author. Principal components analysis and exploratory factor analysis

using the T1 sample supported a scale of the following five items: 'I enjoy being at work', 'I feel like my work is appreciated', 'We in this agency experience that our opinions are listened to and considered by the leadership', 'I experience that my job tasks are aligned with the goals of our agency', 'We experience that we can raise questions and concerns to the leadership'. We ran CFAs using the T2 sample and the results supported its use, see results. The reliability alphas of the job satisfaction scale were acceptable ($\alpha = 0.85$ at T1 and $\alpha = 0.79$ at T2).

3.2.5. Missing data.

Four participants (3.3%) did not respond to the ICS at T1, and seven participants (5.8%) did not respond at T2. Four participants (3.3%) did not complete the stress or job satisfaction index on T1, and three did not complete these at T2. There were no significant differences between respondents and non-respondents on any study variable at T1 or T2. At T1, three participants (2.5%) had missing values on six out of 18 items on ICS. Two participants at T2 had missing values on 15 out of 18 items on ICS. A series of sensitivity analyses were completed, and missing values did not significantly affect the results.

3.3. Procedure

At the beginning of the implementation of EAS in the CWSs, a notice of the opportunity to participate in an upcoming survey was given at general meetings with CWS practitioners. Following this, emails were sent to all practitioners at the four participating CWS. The emails contained a personal link to the questionnaires. Once the respondent clicked on the link, he or she was first directed to a page containing information about the study and a consent form to be electronically signed by checking the appropriate box. Participation was voluntary. Upon consent, the respondents were directed to the questionnaires. The questionnaire took about 15–20 min to complete. To increase the response rate, a lottery for a gift card in each of the three CWSs was used as an incentive. Those who completed the survey were entered into the lottery. A total of three reminder emails were sent out to practitioners who did not respond. The same procedure was used for the T2 data collection for the three remaining CWSs. However, at T2, the following strategies were used to increase the response rate: (1) in addition to the web-based surveys, paper versions of the questionnaires were administered at scheduled meetings with CWS practitioners, (2) the third reminder emails were personalized and sent from research staff to CWS practitioners, and (3) personal phone calls were completed by research staff to practitioners who did not respond after the third reminder email.

3.3.1. Analytic plan

We ran descriptive statistics, frequencies, and bivariate correlations of all variables included in the study (see [Tables 1 and 2](#)) in order to assess distributions and meeting statistical assumptions. Next, we tested the factor structure (via confirmatory factor analyses) of the ICS at T1 and T2, respectively. To define job stress and job satisfaction indexes, we conducted principal components analysis with the T1 sample to explore the number of components to assume and exploratory factor analysis via principal axis factoring to explore and propose a factor structure. We did a confirmatory factor analysis with the T2 sample to test the factor structure. To test model dimensionality of ICS, job stress, and job satisfaction, we used a comparative fit index (CFI) with values greater than 0.95 and the root mean square error of approximation (RMSEA) with values less than 0.06 as indicating good fit (Boateng, Neilands, Frongillo, Melgar-Quinonez, & Young, 2018). Cronbach's alpha was used to assess the reliability of subscales on ICS, the composite ICS, the job stress index, and the job satisfaction index. We then tested a three-stepped hierarchical multiple regression model at T1 and T2, respectively, with ICS sum scores as the dependent variable. The other variables (respondents' tenure in the CWS, active versus passive participation in the implementation, and post-graduate education) were

Table 2
Means, percentages, standard deviations, and sample size of variables.

	T1			T2		
	Mean	SD	n	Mean	SD	n
Active participation (% yes)	34%	–	129	13.9%	–	157
Post graduate education (% yes)	66%	–	129	71%	–	156
Lenght of tenure	2.27	1.30	129	0.71	0.46	156
Job stress	11.45	4.43	125	11.58	3.82	155
Job Satisfaction	15.72	3.53	125	15.83	3.18	155
ICS ^a Focus on EBP	2.78	0.67	122	2.78	0.66	148
ICS Educational support for EBP	1.99	0.84	122	1.99	0.76	148
ICS Recognition for EBP	2.18	0.74	122	2.21	1.00	148
ICS Rewards for EBP	1.23	0.73	122	1.22	0.81	148
ICS Selection for EBP	2.42	0.73	122	2.44	0.83	148
ICS Selection for openness	2.84	0.58	122	2.24	0.65	148
ICS Total sum	45.14	9.59	122	45.03	10.51	148

^a Implementation Climate Scale (ICS).

entered in step one to analyze their contribution to IC and control for these variables in steps two and three. We expected job satisfaction to be the more dominant contributor to IC. Thus, we entered job stress in step two and job satisfaction in step three to test whether job satisfaction would predict IC even after controlling for job stress.

4. Results

4.1. Factor analyses

4.1.1. Implementation climate

We tested a 6-factor CFA model of the Implementation climate scale at T1, with its six subscales as indicators of the latent variable, Implementation Climate (IC). The model fit the data well $\chi^2(9) = 10.71, p = .30, RMSEA = 0.04$ (90% CI, = 0.00–0.11), and CFI = 0.99. Next, we ran the same CFA model on the data from T2; The model fit the data well $\chi^2(7) = 12.03, p = .10, RMSEA = 0.07$ (90% CI, = 0.00–0.13), and CFI = 0.97. The error variances of two sets of indicators were correlated in the T2 model (Selection for EBP and EBP Focus and Selection for EBP and EBP Training), accounting for the difference in degrees of freedom between the models at T1 and T2. These analyses suggest that the factor structure validated with United States-based samples also fits for Norwegian CWS staff as well.

4.1.2. Job stress

Based on content validity judged by the first and last author, seven items indexing job stress from the questionnaire developed for this study (individual- and organizational aspects of the CWS) was entered in a principal component analysis (PCA) using the T1 sample. Five items loaded above 0.7 on one component, while the following two items 'In this agency, our physical work environment meets our job requirements' and 'In this agency, we are able to change our work habits and procedures to meet emerging needs' loaded above four on two components. PCA was re-run without these items and further analysis with one component was supported. Exploratory factor analysis was

run with the remaining five items indexing one latent factor. All items loaded above 0.5, KMO measure was above 0.7 and verified the sampling adequacy, Bartlett's test of sphericity was significant, and diagonals of anti-image correlation matrix was above 0.7, indicating further analysis was appropriate. The reliability alpha of the job stress scale was acceptable at T1 ($\alpha = 0.80$). We used the T2 sample to test a CFA model of the job stress index with the five items indicating one latent variable. The model fit the data well $\chi^2(5) = 5.98, p = .31, RMSEA = 0.04$ (90% CI, = 0.00–0.12), and CFI = 0.99. The reliability alpha of the job stress scale were acceptable at T2 ($\alpha = 0.69$).

4.1.3. Job satisfaction

Based on content validity judged by the first and last author, seven items indexing job satisfaction from the questionnaire developed for this study (individual- and organizational aspects of the CWS) was entered in a principal component analysis (PCA) using the T1 sample. PCA supported one component, and exploratory factor analysis with seven items indexing one latent factor was completed. Two items, 'In this agency, we communicate poorly with each other' and 'In this agency we get along well' was deleted due to communalities below 0.4. All remaining items loaded above 0.5, KMO measure was above 0.8 and verified the sampling adequacy, Bartlett's test of sphericity was significant, and diagonals of anti-image correlation matrix was above 0.8, indicating further analysis was appropriate. The reliability alpha of the job satisfaction scale was acceptable at T1 ($\alpha = 0.85$). We used the T2 sample to test a CFA model of the job satisfaction index with the five items indicating one latent variable. The model fit the data well $\chi^2(4) = 1.73, p = .78, RMSEA = 0.00$ (90% CI, = 0.00–0.07), and CFI = 0.1. Degrees of freedom was four due to the error variances of two sets of indicators being correlated in the T2 model (We in this agency experience that our opinions are listened to and considered by the leadership' and 'We experience that we can raise questions and concerns to the leadership'). The reliability alpha of the job satisfaction scale was acceptable at T2 ($\alpha = 0.79$).

4.2. Regression analyses

Residuals and scatter plots indicated that assumptions of normality, linearity, and homoscedasticity were met at T1 and T2. As shown in Table 3, job stress and job satisfaction correlated $r = -0.39$ ($p < .001$) and $r = -0.35$ ($p < .001$) at T1 and T2, respectively. Collinearity statistics (Tolerance and VIF) were acceptable. Examination of Mahalanobis distance scores indicated no multivariate outliers.

Results from hierarchical multiple regressions for the T1 and T2 samples are depicted in Tables 5 and 6. For the T1 sample, results showed that length of tenure, active versus passive participation, and post-graduate education accounted for 1% of the variance and did not significantly predict implementation climate (IC; see Table 5). Adding job stress made the model significant $F(1,117) = 13.705, p < .001$, and accounted for an additional 10.4% of the variance in IC. Lower job stress predicted higher IC ($\beta = -0.64, p < .001$). Adding job satisfaction to the model explained an additional 18.6% of the variance in IC and was also significant $F(1,116) = 30.51, p < .001$. In model 3

Table 3
Pearson bivariate correlations between main variables at T1 (clear cells) and main variables at T2 (gray cells).

T1	1	2	3	4	5	6	T2
1. Active participation		–0.35**	–0.22**	–0.00	–0.00	–0.01	1. Job stress
2. Post graduate education	–0.03		0.26**	0.20	–0.08	0.04	2. Job satisfaction
3. Lenght of tenure	0.11	0.29**		–0.27**	–0.18*	0.02	3. ICS Total
4. ICS Total	–0.15	–0.02	–0.04		–0.04	–0.05	4. Lenght of tenure
5. Job satisfaction	–0.08	0.08	0.03	0.49**		–0.10	5. Post graduate education
6. Job stress	0.09	–.14	–0.12	–0.26	–0.39**		6. Active participation

* Correlation significant at the 0.01 level (2-tailed).

** Correlation significant at the 0.001 level (2-tailed).

Table 4
Means, standard deviations and alphas of Implementation Climate Scale, and comparison of results with Child Welfare sample in the United States.

	T1 ^a (N = 122)			T2 ^a (N = 148)			Ehrhart 2016 ^b (N = 215)		
	Mean	SD	α	Mean	SD	α	Mean	SD	α
ICS total avg	2.24	0.47	0.87	2.23	0.49	0.88	2.32	0.66	0.89
ICS subscales									
Focus on EBP	2.79	0.66	0.84	2.78	0.66	0.82	2.96	0.90	0.88
Educational support for EBP	2.00*	0.84	0.87	1.97*	0.74	0.79	2.62*	1.01	0.82
Recognition for EBP	2.19*	0.74	0.76	2.19*	0.76	0.78	1.89*	1.00	0.77
Rewards for EBP	1.23*	0.73	0.52	1.20*	0.78	0.61	0.82*	0.97	0.73
Selection for EBP	2.42	0.73	0.88	2.43	0.82	0.86	2.30	1.00	0.88
Selection for openness	2.84	0.58	0.87	2.78	0.64	0.93	2.83	0.87	0.83

^a Norwegian child welfare services, ^b Child welfare services in the United States (CA, IL, OK), * significant difference between means at P < 0.01.

Table 5
Model summary of hierarchical regression for predictors of implementation climate.

Step	T1 (N = 122)				T2 (N = 148)			
	R	R ²	ΔR ²	P	R	R ²	ΔR ²	P
1 ^a	0.10	0.01	0.01	0.762	0.31	0.10	0.10	0.002
2 ^b	0.34	0.11	0.10	0.000	0.38	0.15	0.05	0.005
3 ^c	0.51	0.326	0.19	0.000	0.51	0.26	0.11	0.000

^a Tenure, active versus passive participation, and post graduate education.
^b Job stress.
^c Job satisfaction.

with all five variables, only job satisfaction was a unique predictor of IC ($\beta = 1.12, p < .001$), and together the five independent variables accounted for 30% of the variance in IC.

The step 1 model using the T2 sample was significant $F(3144) = 5.19, p < .01$ with length of tenure, active versus passive participation, and post-graduate education accounting for 10% of the variance in IC. Tenure was a unique predictor ($\beta = -1.53, p < .01$); the longer the tenure, the lower the scores on IC. Adding job stress to the regression model in step 2 accounted for an additional 5% of the variance in IC, and the model was significant $F(1143) = 8.28, p < .01$. Tenure ($\beta = -1.53, p < .01$) and job stress ($\beta = -0.52, p < .01$) were both unique predictors of IC. Adding job satisfaction to the model in step 3 explained an additional 11% of the variance in IC and was also significant $F(1142) = 20.54, p < .001$. In the final model with all five variables, tenure ($\beta = -1.49, p < .01$) and job satisfaction ($\beta = 0.98, p < .001$) were unique predictors of IC. The final model accounted for 26% of the variance in IC.

Table 6
Hierarchical regression analysis for variables predicting implementation climate.

Variables	Step 1			Step 2 ^a			Step 3 ^a		
	β	SE	St.β	B	SE	St.β	β	SE	St.β
T1 (N = 122)									
Tenure	-0.37	0.64	-0.06	-0.67	0.61	-0.10	-0.65	0.55	-0.10
Participation	-1.33	1.64	-0.08	-0.70	1.57	-0.04	-0.42	1.40	-0.02
Post grad edu	-0.13	1.72	-0.01	-0.41	1.64	-0.02	-0.69	1.47	-0.04
Job stress				-0.64 ^{**}	0.17	-0.33	-0.32	0.17	-0.16
Job satisfaction							1.12 ^{**}	0.20	0.46
T2 (N = 148)									
Tenure	-1.53 [*]	0.58	-0.22	-1.53 [*]	0.57	-0.22	-1.49 [*]	0.53	-0.22
Participation	-1.12	1.87	-0.04	-1.24	1.99	0.05	-1.12	1.87	-0.05
Post grad edu	-2.72	1.65	-0.14	-2.79	1.61	-0.15	-2.41	1.51	-0.13
Job stress				-0.52 [*]	0.18	-0.22	-0.24	0.18	-0.10
Job satisfaction							0.98 ^{**}	0.22	0.35

* p < .01.
** p < .001.

5. Discussion

This study investigated individual-level predictors of implementation climate, a factor that accumulating evidence suggests is important for quality improvement in health- and welfare services. Prior studies have linked implementation climate (IC) to successful implementation of organizational change and EBPs. IC has not, however, been studied in Norwegian CWSS, and little is known about individual-level predictors of IC internationally. In this study, we tested the psychometric properties of a Norwegian translation of the Implementation Climate Scale (ICS, Ehrhart et al., 2014), and whether practitioner characteristics predicted IC in Norwegian CWSS.

5.1. Individual-level predictors of implementation climate

This study confirms associations between certain characteristics of practitioners and their perceptions of their organization's IC. Job satisfaction was a unique predictor of IC at both timepoints and accounted for the majority of variance explained by the practitioner characteristics tested. Length of tenure was a unique predictor of IC at T2 controlling for the other four study variables, however, tenure did not predict IC at T1. Job stress was a significant predictor at T2 controlling for tenure, post-graduate education, and active participation. However, a large proportion of the variance accounted for by job stress was explained by job satisfaction. Contrary to our hypotheses and prior studies on constructs similar to IC (e.g., readiness for change; Oreg et al., 2011; Melas et al., 2012), post-graduate education and active versus passive participation in the implementation process did not predict IC.

5.2. Job satisfaction

Prior implementation studies on job satisfaction have predominately investigated how implementation processes and determinants influence practitioners' job satisfaction (Johnson & McIntye, 1998; Lawrence et al., 2015). The present study adds to the literature by finding that more satisfied practitioners rate their organization's IC as better compared to less satisfied practitioners, suggesting that the relationship between IC and job satisfaction could be bi-directional. Thus, job satisfaction could also serve as an important antecedent or proximal indicator of IC. Assessing job satisfaction both at initial phases and during an implementation process, could therefore contribute to explanations of implementation determinants and outcomes. Moreover, highly satisfied practitioners are likely more easily identified by leaders, and they may be a useful resource to empower in implementation. For instance, selecting satisfied practitioners for implementation champion roles may facilitate implementation citizenship behavior as they may spread positive attitudes and perceptions towards implementation among their coworkers. On the other hand, unsatisfied practitioners may pose barriers to IC and call for strategic caution in the selection of roles in implementation. In sum, strategic priorities and role selection based on job satisfaction may help implementation processes utilize more of the implementation potential available in the organizations' current IC, without necessarily changing the IC per se.

5.3. Job stress

We expected job stress to be a strong predictor of IC based on prior associations found between job stress and implementation determinants (implementation buy-in, McCrae et al., 2014; innovation climate, Ren & Zhang, 2015), and the high prevalence of job stress found in CWSs internationally (Boyas & Wind, 2010; Griffiths et al., 2018; Regehr et al., 2000; Sauter et al., 1999). More stressed practitioners generally had lower scores on IC compared to their less-stressed colleagues, and job stress was significantly associated with IC at both timepoints controlling for tenure, post-graduate education, and active versus passive participation. The contribution of job stress to the model, however, could be explained by job satisfaction. Job stress and job satisfaction had a moderate correlation at both time points, in which more job stress correlated with less job satisfaction. In sum, the results imply job satisfaction as the stronger individual-level predictor of IC, and that explanatory contribution to IC from job stress primarily works through affecting job satisfaction. Thus, efforts to increase job satisfaction to improve IC could benefit from reducing job stress among highly stressed practitioners. The relationship may be reciprocal, and improving job satisfaction may also reduce perceptions of job stress, which could make efforts to improve job satisfaction beneficial to IC when job stress is high. Studies suggest that child welfare practitioners can indeed experience high degrees of stress at work and still be satisfied with their job (Stalker, Mandell, Frensch, Harvey, & Wright, 2007). As noted by Williams and Glisson (2014), job stress may even be a necessary feature of effective services in the current demands of child welfare practice, and some practitioners may thrive in a stressful environment when they are able to cope, satisfied, and feel that their efforts are making a difference to children and families. Other studies in social welfare, however, have found high job stress to decrease work performance (Wright & Cropanzano, 1998) and job satisfaction indicated by increased turnover intentions (Liu, Zhu, Wu, & Mao, 2019). Additionally, excessive job stress has consistently been linked to reduced wellbeing among welfare practitioners, especially in the form of emotional exhaustion (Lizano, 2015). Emotional exhaustion has been indicated as the central mechanism of *change fatigue* (Bernerth, Walker, & Harris, 2011), described as apathy and resignation towards change. Thus, organizational structures and strategies designed to push the limits of coping with stress could be to gamble with the practitioner's proficiency, affective wellbeing, and perceptions towards

implementation.

5.4. Length of tenure

Job tenure was a unique predictor of IC at T2, with longer tenure being associated with more negative perceptions of IC. There was a similar trend at T1 that did not reach statistical significance. Studies of attitudes towards implementation of EBPs suggest that longer tenure can be accompanied by increased self-efficacy and autonomy, which in turn can decrease positive attitudes towards implementing new practices (Egeland et al., 2016; Oreg et al., 2011). Our results, to some degree, indicate that the same explanation could apply to perceptions of IC; when practitioners become more settled and autonomous in their work, professional curiosity can diminish, implementation of EBPs can appear less appealing, and these attitudes can affect perceptions of IC. Norwegian CWSs have a strong tradition of professional eclecticism, and there has been considerable resistance towards EBPs in Nordic countries, partially due to EBPs being perceived as unfit for the fluctuating and dynamic child welfare practice (Mullen, Bellamy, & og Bledsoe, 2008). Rigid manualized practice, sometimes associated with EBPs, can be perceived as a threat to practitioners' professional autonomy (Borntreger, Chorpita, Higa-McMillan, & Weisz, 2009). Thus, as experience and sense of autonomy grow, attitudes towards EBPs and perceptions about IC might decrease because practitioners experience EBPs as divergent from current practice and incongruent with their preferences and needs (Aarons, 2004). In other words, tenure may assert its effects on IC through the mediating effects of perceptions about EBPs (e.g., contextual appropriateness). Regardless of whether these perceptions are correct, they may represent significant barriers to implementation in CWSs. To improve attitudes and climate for implementing EBPs in CWSs, tailored implementation strategies may be needed to demythologize EBPs as inflexible and unfit for child welfare practice. Coinciding, strategies for re-design and adaptation of EBPs to better accommodate contextual needs and preferences could also be warranted (Lyon & Bruns, 2019). Thus, practitioners' perceptions of EBPs, and especially how acceptable, appropriate, and usable they perceive EBPs to be, could be key to successful re-design and subsequent implementation.

An alternative or complementary explanation could be that experienced practitioners have gained more contextual awareness about organizational characteristics of CWSs and its conditions for implementation. When practitioners are constantly under scrutiny, working with high caseloads, scarce resources, and demanding directives, implementation of new practices can appear insurmountable. Thus, in their skepticism towards their IC, practitioners with more experience may be more aligned with reality compared to the less experienced and more optimistic practitioners. As observed by Williams and colleagues (2018), a positive IC can depend on a positive molar organizational climate to promote successful implementation. Having highly stressed and unsatisfied practitioners is likely detrimental to the molar organizational climate. Consistently experiencing these conditions through organizational changes may induce change fatigue (Bernerth et al., 2011). As such, working on changing the premises (i.e. molar organizational climate) that induces high stress and low job satisfaction and, subsequently, unfavorable perceptions about IC could be necessary to build long term capacity for quality improvement and implementation of EBPs in CWSs. Organizational interventions focusing on improving culture and climate for implementation (e.g., Availability, Responsiveness, and Continuity [ARC] intervention, Glisson & Schoenwald, 2005; Leadership and Organizational Change for Implementation intervention, Aarons, Ehrhart, Farahnak, & Hurlburt, 2015) have the potential to improve these premises. However, system-level intervention and change may also be needed to address these issues long term.

The discrepancy observed at T1 and T2 could be due to either of the mechanisms theorized above, or a combination. The stronger

association between tenure and perceptions of IC at T2 could reflect the more experienced practitioners having their skepticism strengthened by observing implementation barriers between T1 and T2. The implementation process did encounter significant barriers, and this could reinforce the already slightly negative perceptions of EBPs as unappealing or conditions for implementation as unfavorable. Practitioners with less tenure may have remained more positive to IC because of more positive experiences with the implementation process and the practices implemented, or they may not have experienced re-occurring implementation barriers to the same degree as more experienced practitioners. We cannot be certain the discrepancy reflects a change in individuals because only a minority of the sample participated at both timepoints.

Tenure may be a factor to consider in assigning roles in implementation processes. Regardless of why less experienced practitioners are more positive towards implementation, they may be more likely to exhibit implementation citizenship behavior in an implementation champion role. However, because of their limited experience, they may be less likely to be local opinion leaders, which may be a vital characteristic of champions who effectively create and sustain implementation engagement among co-workers (Kirchner et al., 2012). Thus, strategically assigning less experienced (and satisfied) practitioners to champion the more practical aspects of implementation strategies may be more beneficial. For instance, coordinating communication with intermediaries, providing local technical assistance (e.g., support audit and feedback system, manage implementation material), or contingency plan management is all essential tasks that require positive and engaged individuals within the CWS. Less experienced practitioners may also be more eager to learn, and involving these practitioners early in implementation roles may be increasingly beneficial as they gain more experience and status among co-workers.

5.5. Post-graduate education and active versus passive participation in implementation

Our hypothesis suggesting that practitioners with post-graduate education would have lower scores on IC was not supported. Prior studies on associations between education and implementation determinants have found divergent results (Egeland et al., 2016; Oreg et al., 2011). Taken together, more studies would be needed for post-graduate education to have meaningful implications for implementation, and future studies on different forms of education as predictors of implementation determinants should assess associations with multiple determinants for comparison purposes (e.g., IC, attitudes towards EBPs, individual readiness for change).

Active participation is theorized to increase implementation buy-in by creating a sense of agency, contribution, and control over commencing changes (Armenakis & Bedeian, 1999). There may be several possible explanations for our null finding: The implementation may not have been inclusive enough for active participants to create implementation buy-in. Prior studies looking at participation have involved staff in both planning and execution of implementation (Oreg et al., 2011). In the current implementation process, the staff were labeled active participants if they were involved in the experimental intervention or execution of implementation strategies (e.g. received training in the intervention, were trained and used as implementation champions, or were assigned specific roles in implementation), while only a few were directly involved in planning (e.g. co-creating implementation strategies). Active participation at the outset of implementation planning might be necessary to create a sense of ownership strong enough to alter attitudes and perceptions about implementation.

Practitioners may also be able to distinguish between their subjective attitudes towards implementation and their objective rating of their organization's IC. The current implementation process has had variable success in overcoming barriers encountered throughout

implementation, which (1) could be curbing general implementation engagement, and (2) could spread awareness about shortcomings in the implementation climate and thus cancel out effects from being an active participant.

5.6. Norwegian translation of the implementation climate scale

Confirmatory factor analysis (CFA) revealed that the implementation climate scale (ICS) previously validated in CWSs in the United States (Ehrhart, Torres, Wright, Martinez, & Aarons, 2016) also exhibited acceptable psychometric properties in Norwegian CWSs using the Norwegian translation. Results confirm that the Norwegian translation of ICS can be a useful tool for measuring important determinants for quality improvement and implementation of EBPs in Norwegian CWSs.

As depicted in Table 4, total IC scores from the Norwegian CWS samples were somewhat lower compared to that of Ehrhart and colleagues (2016) from CWSs in California, Oklahoma, and Illinois, but the differences were not statistically significant. There were, however, some significant differences between means on IC subscales. Norwegian practitioners scored educational support for EBPs to be lower compared to US practitioners at both time points, which is unsurprising knowing that Norwegian CWSs have a tradition of eclecticism and a history of some resistance towards EBPs. More surprisingly, Norwegian practitioners scored significantly higher on rewards for EBPs at both time points, and to our knowledge, there are no systematic practices in Norwegian CWSs for providing rewards for EBP use. Although scores on this sub-scale were relatively low in all samples compared to scores on the other sub-scales, the Norwegian means were higher on all three subscale items. The largest difference was observed in the item about accumulating compensated time from EBP use. Time compensation is a regular practice bound by law in Norway (Working Environment Act §10-6). Some respondents may have scored this item high because all overtime practice is compensated, and thus EBP use as well. Item 12 could be prone to misinterpretation in the Norwegian translation («Denne tjenesten gir muligheter til å opparbeide avspasering for å kompensere for overtid som følge av bruk av kunnskapsbasert praksis»), and a further specification stating that the item is referring to additional compensation beyond regular compensation might be warranted in further use of the translation. The alphas were low for the rewards subscale at both time points, which may also reflect differences in how it was interpreted, and how practitioners are rewarded in Norway compared to where initial ICS development took place.

Scores on recognition for EBPs were significantly higher in the Norwegian sample at both time points, with the biggest difference observed in the item about EBP use increasing likelihood for promotion. This finding is somewhat surprising, seeing as we are not aware of CWSs practicing promotion policies based on use of EBPs. A likely explanation can be found in the way the use of EBPs are defined and operationalized in Norwegian CWSs. Evidence-based practice translated into “kunnskapsbasert praksis” can be interpreted as competent unification of elements of EBPs with the more autonomous expertise of practitioners and the needs and preferences of clients. Thus, practicing EBPs, although practitioners are not using EBP protocols per se, can be interpreted as synonymous with being a competent practitioner and subsequently increases the likelihood of promotion. Further use of the Norwegian translation should consider stating whether practicing EBPs refers to the integration of elements of EBPs within the more autonomous experience-based practice, or whether EBPs refer to specific protocols of evidence-informed interventions.

6. Limitations

Several limitations should be noted. Firstly, the results may not be completely representative of the population because some invited practitioners chose not to participate. Secondly, the development of the

scales for job satisfaction and job stress did not fully adhere to best practice guidelines for scale development (Boateng et al., 2018). The complete 32 item questionnaire about individual- and organizational aspects of the CWS was not subjected to psychometric testing. Instead, the first and last author chose items indexing job stress and job satisfaction based on content validity and completed separate psychometric testing of the scales. Including all 32 items in PCA and EFA could have resulted in a different factor structure. Third, implementation climate (IC) is inherently a unit level construct, and characteristics at individual, team, organization, and system levels all may be likely to have an impact on measures of IC. Thus, the use of multi-level and cross-level analyses could be utilized when measuring associations across two or more levels of analysis. In tackling multi-level constructs that are underexplored, however, a focus on fewer levels of analysis as a first step can be beneficial to developing theory (Kozlowski & Klein, 2000). As few studies have investigated individual-level predictors of perceptions of IC, single-level analysis was found appropriate in the present study. Finally, while we use the term "prediction" when referring to our analyses, this denotes prediction in a statistical sense and does not necessarily infer causality. Future studies should examine causality and temporal impacts of implementation strategies on implementation determinants, mechanisms, and outcomes.

7. Conclusions

This study furthers our understanding of how individual characteristics are associated with implementation climate (IC) in child welfare services and can aid future exploration of why implementation initiatives succeed or fail. Practitioners' job satisfaction emerged as a strong determinant of IC, more than did job stress, post-graduate education, and whether they were active participants in implementation. These results imply that job satisfaction may play an important role in mechanisms to improve organizational conditions for implementation of EBPs. However, it may also be that IC can affect practitioner job satisfaction, a hypothesis that can be tested in future studies. Practitioners with longer tenure in CWSs were more skeptical towards IC, and significantly so in the second sample measuring IC during an implementation process. Experienced practitioners may have more contextual awareness, more skepticism towards EBPs, change fatigue from recurring implementation processes, or a combination of the above. Implementation interventions may consider addressing system, organizational, group, or individual level strategies to increase job satisfaction as a mechanism towards improving IC. Additionally, job satisfaction and tenure may help prioritize implementation strategies and assign appropriate roles in implementation processes.

CRedit authorship contribution statement

Thomas Engell: Conceptualization, Methodology, Formal analysis, Investigation, Data curation, Writing - original draft, Visualization, Project administration, Funding acquisition. **Benedicte Kirkøen:** Data curation, Writing - review & editing, Investigation, Project administration. **Gregory A. Aarons:** Conceptualization, Writing - review & editing, Supervision. **Kristine Amlund Hagen:** Conceptualization, Methodology, Formal analysis, Validation, Writing - review & editing, Supervision, Funding acquisition.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Ethics approval

This study was reviewed and approved by the Norwegian Centre for Research Data (NSD) October 2017, project number 47161.

Data availability

Data from the current study is not publicly available due to confidentiality requirements. Data in summarized forms can be obtained from the corresponding author, details removed to adhere to blind review, on reasonable request.

Appendix A. Supplementary material

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.childyouth.2020.105509>.

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