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ORIGINAL ARTICLE

Evaluating physical environments for older people—Validation of the Swedish version of the Sheffield Care Environment Assessment Matrix for use in Finnish long-term care

Niina Wahlroos MNSc, Nurse Manager[1,2] | Minna Stolt PhD, Docent, University Lecturer, Podiatrist, Researcher[1,2] | Susanna Nordin PhD, RN, Senior Lecturer[3] | Riitta Suhonen PhD, RN, FEANS, Professor, Director[1,4]

[1]Department of Nursing Science, University of Turku, Turku, Finland

[2]Turku University Hospital, Turku, Finland

[3]School of Education, Health and Social Studies, Dalarna University, Falun, Sweden

[4]Turku University Hospital and City of Turku, Welfare Division, Turku, Finland

Correspondence
Niina Wahlroos, Department of Nursing Science, 20014 University of Turku, Turku, Finland.
Email: nielni@utu.fi

Abstract

Aim: To validate a Finnish version of the Sheffield Care Environment Assessment Matrix (S-SCEAM) instrument for assessing the physical environment of long-term care settings and to describe the current status of the environmental quality of long-term care settings for older people in Finland.

Background: The importance of providing a well-designed physical environment for older people is supported by the research literature. There is limited research of the physical environments of long-term care settings from the perspective of nursing science and nor is there much research into the instruments for assessing them.

Design: A descriptive, correlational and observational study.

Methods: Forward and back translation process was used followed by structured observations with S-SCEAM-Fin in 20 long-term care units in intensive residential care facilities for older people with 24-h nursing assistance and with extensive support for daily activities. Spearman's rho correlation, Cohen's kappa, percentage of agreement and Kuder–Richardson formula coefficients were calculated to assess psychometric properties of the translated S-SCEAM-Fin. S-SCEAM-Fin standardised scores were calculated to describe the current status of the environmental quality.

Results: Inter-scale (domain) correlations showed low to moderate correlations between the domains. Consistency was acceptable in four of the domains. Cohen's kappa values indicated good (0.796 and 0.648) intra-rater and inter-rater (0.910 and 0.553) reliability. The overall mean of the standardised scores was 57.00, but there was variation between domains. Small units received the highest scores in the six domains.

Conclusions: S-SCEAM-Fin was useful in assessing environmental quality. Assessment of the environmental quality disclosed deficiencies in ensuring settings adequate for older people.

Implications for practice: The increasing numbers of older people with health conditions are residing in long-term care settings. It is essential to create supportive physical environments. The instrument can be useful when planning new facilities or proposing new recommendations for institutional living environments.

KEYWORDS
assessment, instrument validation, long-term care, older people, physical environment, SCEAM

1 | INTRODUCTION

The physical environment is an essential aspect of an individual's health and well-being (Huisman et al., 2012; Ulrich et al., 2008) and can be expected to be especially important in long-term care (LTC) where many residents spend most of their time inside and around the setting (Bernard & Rowles, 2013). With increasing levels of physical and cognitive frailties such as impaired mobility and deteriorated spatial perception, the physical environment should be adjusted to meet the needs of the older persons (Lawton & Nahemov, 1973). To ensure that long-term care settings will support people with frail health, more knowledge is required on the quality of the physical environment. One way to acquire such knowledge is to evaluate existing care environments by using valid assessment instruments. Thus, the present article describes the process of translation and adaptation of S-SCEAM-Fin, the Finnish version of the observational Sheffield Care Environment Assessment Matrix (SCEAM).

According to Kim's typology, the care environment can be divided into physical, social and symbolic environment (Kim, 1987). Physical environment refers to the concrete, built environment around a person. Social environment includes social relationships and the challenges they create. Symbolic environment, consecutively, consists of culture, language and religion. Together they construct a complex interaction which contributes to a person's well-being (Kim, 1987). Physical environment affects the experience of well-being for example by delivering the physical and cognitive support for older person. Railings and colour-marked corridors compensate for decline and thus are essential for preserving the independence (Douma et al., 2017; Potter et al., 2018). Decreasing agitation in a person with cognitive impairments and increasing physical activity (Douma et al., 2017; Wilkes et al., 2005) are other examples of outcomes which a high-quality physical environment has been shown to produce. There are various methods by which the physical environment can be adapted to achieve these outcomes. The changes made to the environment do not always need to be a major, whole building refurbishment; minor, decorative improvements to a unit can also modify the environment to meet the needs of older people (Rijnaard et al., 2016). Easily made adjustments are using colours and reference points to highlight walking paths, or to re-arrange the furniture to encourage feeling of home (van Hoof et al., 2016; Marquardt et al., 2014) or social interaction (Geboy, 2009).

What does this research add to existing knowledge in gerontology?

- Given the importance of the environment for people, this study points out several shortcomings in the physical living environment of older people in long-term care settings that warrant urgent improvement.
- The physical environment is not currently optimally exploited to support older people's functional abilities, nor to be homelike or inviting.

What are the implications of this new knowledge for nursing care for older people?

- Modifying the environment in line with research evidence may potentially have a positive impact on how an older person perceives their living environment and support independence and functional ability.
- The physical environment should be considered to be a determinant of outcomes in older people's lives and investing in it is therefore worthwhile.

How could the findings be used to influence policy, practice, research and education?

- The physical environment in residential and institutional care settings warrants assessment and review and should be included in countries' local authority strategies when building and renovating such built environments.
- Care workers can contribute to the physical environment by viewing it from the resident's perspective and reshaping and modifying it accordingly.
- The study provided translated and validated version of the S-SCEAM which can be used to evaluate physical environments for older people.

For the past decades, there has been a growing interest in care environments for older people, and several studies have shown relationships between the design of the physical environment and health outcomes (Joseph et al., 2016; Nordin et al., 2017a). For

instance, environmental features such as reduced noise sound and contact with nature can improve sleep and orientation among older people and increase overall well-being (Brawley, 2001; Joseph et al., 2016). In general, a person is not aware of their environment if life in it is effortless. According to Lawton and Nahemov's (1973) ecological model of ageing, a person's awareness of the environment increases when there is a change in their functional ability or a change in their environment. Impairment in older people's functional ability is partly due to unsuitable environments and the importance of the living environment thus increases as functional ability weakens (Lawton & Nahemov, 1973; Wahl et al., 2012). Good quality environmental design responds to the needs of older people and supports their independence, well-being, and quality of life (Davis et al., 2009; Nordin et al., 2017b; Shield et al., 2014). There is an increasing amount of evidence of the benefits of personalised, small-scale living which enables choices to be made and encourages older people to continue their familiar lifestyle (e.g. Kok et al., 2018; Nordin et al., 2017a). Although the physical environment of LTC settings should resemble home, focusing on safety and building requirements (e.g. The National Building Code of Finland) can instead create institutional environments (Cutler et al., 2006).

Designing the physical environment of LTC settings involves many challenges. To begin with, in LTC where the residents have unique and varying expectations and needs, it is difficult to individualise the environment to meet the needs of all residents'. An environment that provides well-being for one resident may not be a good place for another (Davis et al., 2009). Secondly, researchers' or architects' perception of a quality environment may differ from that of the older person (Parker et al., 2004; Vischer, 2008) despite the older person being the most significant user of the environment. A final point is that there are a variety of buildings from different decades which serve as LTC settings (Parker et al., 2004) and that the organisational culture and ideology of the service provider will affect the physical environment and the way it is utilised (Potter et al., 2018; Spasova et al., 2018). Despite the importance of the physical environment, there is limited research on the current condition of the physical environments of LTC settings from the perspective of nursing science and nor is there much research into the instruments for assessing them (Elf et al., 2017; Joseph et al., 2016).

Numerous instruments, many developed decades ago, have been used in research to assess physical environments. A recent review identified more than 20 instruments, many of which were non-validated with use often limited to one piece of research by the developer. The original SCEAM is targeted directly at LTC settings for older people, and it is based on a strong theoretical foundation, and a person-centred perspective since it assesses the quality of the physical environment with regard to how well a care setting is supporting the needs of its residents. Also, it had been validated to some degree (Elf et al., 2017). Its recently (Nordin et al., 2015) adapted and validated Swedish version, S-SCEAM, also accommodates assessment of the Finnish LTC settings for older people. Sweden and Finland both represent the Nordic welfare countries where LTC is a part of the universal health and social care system. The responsibility for organising LTC rests with the municipalities. They can organise it in several ways; they can produce services themselves, in cooperation with other municipalities, or purchase the services from private providers. Municipal health and social care professionals assess older person's needs for social and healthcare services and after the assessment, the municipality is responsible for drawing up a service plan defining the services required and makes the final decision about the provision of services. LTC is provided mostly in residential care facilities. Standard residential care contains sheltered housing with support services (e.g. meals-on-wheels and cleaning) and possibility to have daytime nursing assistance. Intensive residential care is provided in sheltered housing facilities with 24-h nursing assistance and with extensive support for daily activities.

The importance of providing a well-designed physical environment for older people is supported by the research literature (Fleming et al., 2016; Joseph et al., 2016), and an instrument is needed to ensure consistent assessment of these environments. The data collected are informative for those who are planning and designing new facilities as well as those renovating and redesigning existing LTC settings (Elf et al., 2017). The instrument is also needed to standardise the features of the physical environment, for example, when studying the relationships between the features of settings and the well-being of the older people (Potter et al., 2018).

The purpose of this study was twofold: (1) to validate a Finnish version of the Sheffield Care Environment Assessment Matrix (S-SCEAM) instrument for assessing the physical environment of long-term care settings and (2) to describe the current status of the environmental quality of long-term care settings for older people in Finland.

2 | METHODS

2.1 | Design

A descriptive, correlational and observational study design was employed. This study followed a two-step process. Firstly, the S-SCEAM instrument was translated from Swedish into Finnish. In the second step, the empirical data were collected using the translated instrument. The data were used to assess the reliability of the Finnish version of S-SCEAM (S-SCEAM-Fin) and for a preliminary description of the state of environmental quality in LTC settings. The data collection was conducted during May 2019.

2.2 | The Sheffield Care Environment Assessment Matrix (SCEAM) instrument

The Sheffield Care Environment Assessment Matrix (SCEAM) was developed for use in care settings for older people in the United

Kingdom. It is based on a theoretical framework where the quality of the physical environment is understood in terms of supporting the needs of older persons with frail health and facilitating high-quality care (Parker et al., 2004). The original SCEAM was developed in early 2000, but in 2015 it was translated into Swedish and adapted to correspond to the care environments typical in Scandinavia (Nordin et al., 2015). The more than 300 observable items of the original SCEAM were reduced to 210 items structured into eight domains: privacy, choice, safety, comfort, physical support, cognitive support, normalness, and openness and integration. For instance, in the domain physical support—an item is; 'Are there handrails in circulation areas?' In the domain cognitive support—an item is; 'Is the main entrance designed so it is easy to find?'.

The instrument is simple to use, and the observation is conducted by walking through the building and marking whether the observable item is present (1) or absent (0) representing nominal level data. The scores obtained are then standardised by calculating a percentage using the formula: number of items present/number of all items × 100, producing scores in a range from 0 to 100. High scores indicate a higher quality physical environment. In addition to the domains, it is also structured into building locations such as dining areas, lounges and gardens (Nordin et al., 2017a)

2.3 | Translation

Validation and cultural adaption of the S-SCEAM-Fin instrument was a multistage process (Maneesriwongul & Dixon, 2004) which started with forward and back translation of the instrument followed by bilingual expert panel review (Sousa & Rojjanasrirat, 2011). The multistage process ensured that the translation corresponded to the S-SCEAM instrument both linguistically and semantically (Wild et al., 2005).

First, S-SCEAM was translated from the source language, Swedish, into the target language, Finnish, by two independent translators. Translator 1 was a professional translator and translator 2 was a bilingual researcher (NW). The translations were compared and combined to produce an appropriate translation in a comprehensible Finnish language. This translation was then back-translated into the source language (Sousa & Rojjanasrirat, 2011).

The back-translated instrument was compared with the S-SCEAM instrument to identify discrepancies. The discrepancies were minor. A total of 65 of the items were identical. The differences in 94 of the items were a result of word choices, rather than content. A total of 51 items differed in content and expression, and these were reviewed by an expert panel (n = 4) consisting of bilingual experts in nursing science and elderly care. The appointed experts examined every item, and after reaching a consensus of interpretation, the appropriate translation was formulated (Sousa & Rojjanasrirat, 2011). There was no need for the expert panel to complete numerical evaluation since complete agreement was reached after review (DeVon et al., 2007). To finalise the translation process, the content of the items was discussed with the developer of S-SCEAM to confirm interpretation and to strengthen assessment. Furthermore, the discussion confirmed the similarities in features of LTC settings between Sweden and Finland. S-SCEAM-Fin was subsequently constructed.

2.4 | Data collection

The empirical data in the study were collected by structured observations using S-SCEAM-Fin. The purposive sample consisted of 20 publicly funded, local authority LTC units in one of the largest cities in Finland. The city provides housing services for older people in five centres. The sample was 20 of total 30 units, and the units represented all four centres and were selected randomly among them. The managers of the city's older people's housing services ensured access to the units. Some units were situated in the same building with the unit being defined as the space in which the older people's private rooms were located and where they primarily resided; usually this equated to the residential floor. The units were intensive residential care units. Each resident had a small private room (bed, table, armchair, TV/radio) with a bathroom. Layout was usually H-formed, two parallel corridors with private rooms and common areas (living room, kitchen and dining area, balcony/patio and common bathroom) in the middle. The unit supervisors were contacted in advance to schedule observation of settings, and information letters were provided to staff, residents and their family members. Observation of one unit took 1–2 h. Where there were several units in the same building, common spaces such as the entrance and the outdoor spaces were evaluated only once.

2.5 | Procedures

Intra-rater reliability was examined by repeating the observations in two units (10%). The interval between observations was 2 weeks to ensure that the observations were independent of each other while the short time period also provided assurance that the physical environment remained unchanged (Streiner, 2003). Inter-rater reliability was examined by reassessing two units by two raters at the same time but independently (Scholtes et al., 2011). Rater 1 was a researcher (NW) familiar with the study subject and involved in the instrument translation process, while rater 2 (AI) was a Registered Nurse and MNSc student with several years of work experience in LTC settings for older people. Rater 2 was given access to the instrument in advance and a short introduction was provided prior to assessments. To complete the validation of S-SCEAM-Fin, data were collected from 20 LTC units. The collected data were used for two purposes. First, to evaluate the reliability and validity of the instrument and second, to describe current state of the physical environments of LTC settings.

2.6 | Data analysis

The eight domains were formed based on the theoretical descriptions from the Swedish version of the instrument. Percentage of

TABLE 1 Spearman's rho correlation coefficients for S-SCEAM-Fin domains, $p < .05$ in grey

	Normalness	Comfort	Openness and integration	Cognitive support	Safety	Choice	Privacy	Physical support
Normalness		0.582	0.642	0.422	−0.041	0.415	−0.020	−0.182
Comfort	0.582		0.601	0.547	0.535	0.738	0.024	0.128
Openness and integration	0.642	0.601		0.817	0.480	0.420	0.399	−0.214
Cognitive support	0.422	0.547	0.817		0.649	0.142	0.349	−0.053
Safety	−0.041	0.535	0.480	0.649		0.209	0.280	−0.059
Choice	0.415	0.738	0.420	0.142	−0.020		−0.080	0.224
Privacy	−0.020	0.024	0.399	0.349	0.280	−0.080		−0.332
Physical support	−0.182	0.128	−0.214	−0.053	−0.059	0.224	−0.332	

agreement and the Cohen's kappa coefficient were calculated to determine the consistency or equivalence of an instrument by different raters (criteria 0.41–0.60 indicate moderate, 0.61–0.80 indicate substantial, and 0.81–1.00 indicate almost perfect agreement; Viera & Garrett, 2005). Kuder–Richardson formula was used to assess the internal consistency reliability of the translated, dichotomous S-SCEAM-Fin (>0.5 acceptable level; McGahee & Ball, 2009). Spearman's correlation coefficient was calculated to assess the inter-scale correlations between the S-SCEAM-Fin domains. SPSS 26.0 (IBM) descriptive statistics of standardised scores were calculated, such as frequencies, means and standard deviations. A p-value ≤.05 was considered statistically significant.

2.7 | Ethical considerations

The study was approved by the Ethics Committee for Human Sciences of the University (ETMK 26/2019) and by the local administration for housing services for older people. Permission to use and to translate the instrument was obtained both from the original developers of SCEAM and from the developers of the Swedish version S-SCEAM. Although no informants were recruited from the care settings, unit managers, staff and residents were informed in advance of the study and the observation schedule was agreed with the unit managers. To respect privacy, residents were asked for verbal consent for collection of research data before private rooms were entered.

3 | RESULTS

3.1 | Characteristics of the participating units

The study sample consisted of 20 LTC units maintained by one Finnish city. Five of the 20 units were small units for fewer than 15 residents', seven were middle-sized units with 15–30 residents' and the remaining eight were large, with more than 30 residents'. They were located in urban and suburban areas in seven separate buildings. The years in which the buildings were constructed represented different decades spanning a period from the late 1960s to recent years. Two of the units each formed one smaller building, and 18 units were located in five elderly care centres, with three to four units in the same building. The characteristics of the residents and staff were similar in all the units studied: (1) residents needed 24-h assistance and (2) staff consists of Registered Nurses, practical nurses and care assistants, the number of caregivers was based on legal regulation in all units.

3.2 | Psychometrics of the instrument

3.2.1 | Spearman's correlations coefficient

Inter-scale (domain) correlations showed low to moderate correlations between the domains ranging from −0.02 to 0.817. Comfort, normalness and openness and integration were domains closely connected with the other domains. However, the analysis showed the independence of the rest of the domains (Table 1).

3.2.2 | Kuder-Richardson reliability coefficients

The internal consistency of S-SCEAM-Fin was examined using Kuder–Richardson formula. Consistency was acceptable in four of the domains, namely privacy, physical support, cognitive support respectively openness and integration varying between 0.55 and 0.71. Internal consistency of comfort (0.450) and choice (0.393) domains was slightly below the acceptable level in contrast to the domains safety (0.051) and normalness (0.098) in which it was poor (Table 2).

3.2.3 | Agreement and consistency

In intra-rater reliability measurements, the same observer reassessed the units twice. The Cohen's kappa values were 0.796 and

0.648 indicating good intra-rater reliability. In inter-rater reliability measurements, two observers independently assessed two units. Kappa values were 0.910 and 0.553. The raters scored each item as present (1) or absent (0) on the checklist. The percentage of agreement was calculated for each domain. It ranged between 71.1% and 92.1% in inter-rater and between 81.3% and 94.4% in intra-rater measurements (Table 3).

3.3 | Environmental quality

3.3.1 | Overall domain scores

The mean of the standardised scores for all the domains was 57.00, but there was substantial variation between domains (Table 4). The lowest scores were in the domains normalness (mean 44.04, *SD* 9.87) and cognitive support (mean 47.70, *SD* 12.64). It is noticeable that cognitive support scores varied broadly between units. As with cognitive support, there was also great variation for privacy, with the highest score being 68.8 and the lowest 31.3. The highest scores were found in the domains physical support (mean 65.67, *SD* 4.77), safety (mean 64.10, *SD* 4.93) and openness/integration (mean 63.16, *SD* 12.67). The scores for physical support and safety are highly uniform between units. However, the range within the openness and integration domain is wide.

3.3.2 | Domain scores by unit size

The units were classified into three categories according to the number of residents: small (units with less than 15 residents), medium (units with 15–30 residents) and large (units with more than 30 residents). Small units received the best scores within six domains (Table 5). By contrast, in medium-sized units,' scores were lowest in six domains. Unexpectedly, privacy appeared clearly most frequently in large units. The size of the unit had little effect on the physical support scores (65.42; 66.89; 64.74). Between the units located in the same building, there was most variation in the normalness domain. At its highest, the difference was 23.8.

TABLE 2 Kuder-Richardson's correlation coefficients for S-SCEAM-Fin

Domain	Coefficient
Privacy	0.713
Physical support	0.659
Cognitive support	0.646
Openness and integration	0.552
Comfort	0.450
Choice	0.393
Normalness	0.098
Safety	0.051

4 | DISCUSSION

This is one of few studies to explore the quality of the physical environment in Finnish LTC settings. S-SCEAM-Fin showed preliminary encouraging results in a Finnish context, and the instrument was useful in assessing environmental quality. In this sense, the S-SCEAM-Fin instrument functions as an applicable tool for assessing the physical environment in LTC settings and providing quantitative data on environmental quality. Assessment of the environmental quality disclosed deficiencies in ensuring settings adequate for older people, where elements that provide cognitive support and create a domestic environment, that is normalness, in particular can be improved. There was great variation within domains between settings regardless of settings being operated by the same provider.

4.1 | S-SCEAM-Fin instrument

S-SCEAM-Fin was a thorough instrument containing more than 200 items. Nevertheless, its structure was clear and logical, and its use was thus straightforward. The time taken for observations varied between units, but on average the observational time was 1–2 h and similar to previous studies (Nordin et al., 2015; Potter et al., 2018). Items in the assessment instrument corresponded to the LTC settings in Finland and were appropriate to the construct and the assessment objectives, thus indicating good face validity. Finnish legislation on and distribution of elderly care resembles that in Sweden; the proportion of older people residing in LTC settings is approximately the same, as is the division into non-profit and for-profit providers (Szebehely & Meagher, 2018). However, in Sweden each resident has a private apartment with private bathroom and a kitchen/ kitchenette whereas in Finland, and typically in this study, resident's private area consists of a single bedroom with a bathroom. Previous studies have shown that the instrument was carefully developed based on versatile existing knowledge (Nordin et al., 2015; Parker et al., 2004) and the items included were equally relevant to assess the quality of the physical environment in Finland.

TABLE 3 The percentage of agreement for S-SCEAM-Fin

Domain	Percentage of agreement	
	Inter-rater	Intra-rater
Privacy	81.3	81.3
Physical support	86.4	92.0
Cognitive support	84.2	94.4
Openness and integration	71.1	81.6
Comfort	75.9	82.8
Choice	84.0	84.0
Normalness	82.3	82.3
Safety	92.1	90.7

4.2 | Instrument psychometrics

Correlational analysis of the domains showed interesting results. Four domains, namely normalness, comfort, openness and integration and choice were closely related. This result may imply these are the features where an implementation decision is made independently in each unit since these four domains contain items that are not governed by laws, rules, or guidelines and are instead limited to each individual's own views. Although the importance of the environment has been recognised, quality assurance of LTC rarely extends to an environmental review of these domains (Zigante & King, 2019). The Ministry of Social Affairs and Health has issued 'Quality recommendations for developing services for older people' to improve the access to homelike environments in LTC settings, but this does not specify what the homelike, normal environment is to consist of nor how it is to be represented in practice (Ombudsman, 2020; STM, 2017), leaving the decision to the manager's discretion. The location of the setting summarised many items under the openness and integration domain, and the response is greatly subject to individual preferences. Because of high subjectivity, these features are also susceptible to observer bias. It was detected that items in these domains caused most of the disagreement between the raters. The rest of the domains safety, privacy, cognitive and physical support were not associated with others in the correlational analysis and suggest the domains are independent of each other. However, these domains are essential for ensuring good care and a dignified and independent later life. The features of the physical environment in these domains are precisely defined by guidelines, some of which are legal (Social Welfare Act 1301/2014), some ethical (ICN, 2012; NASW, 2017; ETENE, 2008) and some related to national building regulations (Ministry of the Environment, 2017). The physical support domain differs from other domains in terms of the concreteness of the items. For example, when examining the position of railings, the width of the hallways or difference in flooring heights, there is no room for interpretation. As a consequence of the features in the physical support domain, the living environment can be adapted to support the independence of older people in several ways (Ministry of the Environment, 2017; WHO, 2016).

The internal consistency of S-SCEAM-Fin was examined using the Kuder–Richardson formula. Especially, safety (0.051) and normalness (0.098) were showing poor internal consistency. The wide scope of the instrument and the nominal level of assessment may be the reasons for the weak internal consistency of these domains. Relatively often in the assessed units, a difference between common and private living spaces was evident which weakens measurability (Streiner, 2003). A resident's own private room was personally decorated, cosy and homelike, while the common spaces were

TABLE 4 S-SCEAM-Fin overall and domain scores for long-term care units compared with Swedish scores* (Nordin et al., 2017b)

Domain	Mean	*SD*	Range
Privacy	57.53	12.10	31.3–68.8
	60.59*	12.18*	41.1–88.3*
Physical support	65.67	4.77	54.5–72.8
	73.95*	6.89*	63.9–89.3*
Cognitive support	47.70	12.64	33.3–67.7
	60.05*	12.75*	43.6–86.7*
Openness and integration	63.16	12.67	36.8–78.9
	74.39*	7.18*	60.0–86.7*
Comfort	62.61	10.82	44.8–75.9
	76.67*	8.64*	53.0–90.8*
Choice	51.20	8.67	32.0–72.0
	71.07*	9.64*	51.0–87.5*
Normalness	44.04	9.87	28.6–61.9
	73.59*	11.91*	45.8–95.2*
Safety	64.10	4.93	50.0–71.1
	80.35*	6.77*	65.6–93.3*
Overall score	57.00	8.31	44.0–65.7
	71.33*	3.78*	65.3–80.4*

Note: The maximum possible score is 100 (*N* = 20 in both studies).

TABLE 5 S-SCEAM-Fin overall and domain scores distributed by small, medium and large units

	Fewer than 15 residents (*n* = 5)			15–30 residents (*n* = 7)			More than 30 residents (*n* = 8)		
Domain	Mean	*SD*	Range	Mean	*SD*	Range	Mean	*SD*	Range
Privacy	57.50	10.00	37.5–62.5	47.36	9.21	31.3–56.3	66.44	4.35	56.3–68.8
Physical support	65.42	3.67	59.1–68.2	66.89	2.68	61.3–68.2	64.74	6.17	59.1–72.8
Cognitive support	64.16	7.08	50.0–67.7	36.47	5.44	33.3–44.4	47.23	6.82	33.3–55.6
Openness and integration	75.78	2.55	73.7–78.9	52.64	11.76	36.8–63.2	64.48	6.82	47.4–68.4
Comfort	69.68	10.78	48.3–75.9	59.11	13.93	44.8–75.9	61.24	2.88	55.2–65.6
Choice	54.00	4.08	48.0–60.0	50.29	7.84	32.0–72.0	50.00	4.47	40.0–56.0
Normalness	51.42	8.19	38.1–61.9	40.13	7.61	28.6–57.1	42.84	7.13	33.3–57.1
Safety	67.38	3.96	60.5–71.1	60.91	2.12	50.0–65.8	64.83	1.81	63.2–68.4
Overall score	63.22	3.91	55.4–65.3	51.73	7.57	36.5–66.9	57.72	5.06	42.8–66.4

institutional. Similarly, in the safety domain there was a difference especially between indoor and outdoor spaces. Several safety improvement features were observed in indoors but were neglected in the outdoor space as though the residents' living environment were restricted to indoors.

The inter-rater reliability was 0.55 and 0.91 in this data set. For the first unit assessed, the agreement remained moderate. The main reason for this is that rater 1 was involved in the entire translation process and was familiar with the instrument while rater 2 was using the instrument for the first time. Although overall instruction in use of the instrument had been provided in advance, the lack of detailed knowledge of the interpretation and meaning of the items may be a reason behind a deviating observation result (Sim & Wright, 2005). This suggests that use of the instrument would require a more precise definition of the items, although previous studies had reported it as being usable without specific guidance (Elf et al., 2017).

Compared with previous studies, S-SCEAM-Fin showed mildly poorer intra-rater and inter-rater values, which can also be partly explained by a smaller number of observations. In this study only two units were assessed, compared with previous studies which assessed six (Nordin et al., 2015) and five (Potter et al., 2018). Although kappa values cannot be directly compared because they are sensitive to the dataset (Streiner, 2003), a larger sample size could have improved the Cohen's kappa coefficients (Sim & Wright, 2005). The percentage of agreement was overall high. It is easy to be agreed on some items, such as items within well-regulated safety domain. Based on these preliminary results, the instrument can be considered feasible and worthy of further studies.

4.3 | Environmental quality

In this study, the mean score of the LTC units was 57.0. In a study conducted with the original SCEAM in England, the mean was 58.9 (Potter et al., 2018). In Swedish study, the scores for S-SCEAM have been substantially higher (Nordin et al., 2017b). This can be interpreted as indicating that the physical environments for older people in Sweden are of a higher quality than in Finland. This study confirms the finding that the physical environment varies greatly between units (Nordin et al., 2017a). This is alarming and may mean that not all older people residing in an LTC have the opportunity to enjoy a physical environment of equal quality.

In this study, the lowest scores were obtained in the domains of normalness and cognitive support, corresponding to Swedish study (Nordin et al., 2017a). Considering these results, it may be reasonable to conclude that the physical environment of LTCs is institutionalised and provides marginal cognitive support. This is controversial since it has been shown that a good quality physical environment has had a particular impact on the quality of life of older people with dementia (Fleming et al., 2016) and has reduced neuropsychological symptoms (Bicket et al., 2010). The goal of Finnish elderly policy is to promote the functional capacity and independence of older people (STM, 2017) but according to the results of this study, it seems that these guidelines have not been implemented in the physical environment. Approximately 92% of residents residing in LTCs in Finland have a cognitive impairment and dementia has been reported in 53%; internationally the situation is somewhat the same (OECD, 2018; THL, 2017). There would thus be a demand for cognitive support.

Ultimately, the physical environment could be used to maintain an older person's functional capacity by activating them and by utilising their individual resources, rather than it being seen as a depository for older person as a passive object of care. Handrails along the corridor can support persons to walk independently (Zeisel, 2013); contact with outdoor environments and gardens can improve mood and sleep quality (Rappe & Kivelä, 2005) and enhance well-being of people with cognitive disabilities (Cox et al., 2004; Rappe & Topo, 2007); features in the environment such as adjustable tables have been shown to be associated with reduced hazard of walking and eating disability (Slaughter & Morgan, 2012). Identifying the resident's individual needs, values and experiences are key components of participatory planning when building the physical environment for older people, rather than merely the ergonomics of professionals' work (Cutler et al., 2006). There is evidence of positive effects of the physical environment and its multidimensional effect on human well-being (Huisman et al., 2012).

In older people, the environment has explained quality of life more than age, cognitive status, or medication. The physical environment can thus be considered a very important factor in older person's life, but for some reason there is still a gap between research and practice (Cutler et al., 2006; Pettersson et al., 2020). This study focused on the physical environment in LTC settings. The environmental design needs to go hand in hand with the organisational characteristics such as care culture, staff commitment or management, of which all have an impact on the resident's life (Nordin et al., 2015; Sawamura et al., 2013).

5 | LIMITATIONS

The data for this study were collected from units provided by the public sector and in one city. There are a large number of LTC units maintained by both private and third sector organisations which were excluded from the study. The results cannot therefore be generalised to cover all LTC environments, but the study provides an indication of the state of the physical environment of LTCs, since approximately half of the LTC settings for older people in Finland are administered by local authorities. The sample consisted of LTC units with varying numbers of residents and also varied locations. A larger sample expanded to also cover non-local authority units would have contributed to more generalisable results. The S-SCEAM-Fin instrument was translated from the Swedish version of SCEAM. The Swedish instrument was developed and validated cooperatively with the original developers of the SCEAM with adaptation to serve the Scandinavian care context attained during the process. Therefore, S-SCEAM was considered to cover the features of the physical environment in Finnish LTC settings.

6 | CONCLUSIONS

S-SCEAM-Fin worked satisfactorily in observing the physical environment of LTC settings for older people. Even though the instrument is comprehensive, it is nevertheless convenient and easy to use. However, to ensure stability of the assessments, each item should be reviewed and determined in advance. Requirements governing the physical environment change over time, which will challenge use and adaptation of the instrument in the future. It must also be updated whether the physical environment changes. Since elderly care is organised diversely between countries, it is worth ensuring there is an adequate instrument to assess environmental quality.

There is potential for improvements in the physical environment of LTC settings for the older people in all inspected domains, but especially in the domains of cognitive support and normalness. In addition to LTCs provided by local authorities, there are also numerous small, private companies, large care chains and third sector actors offering LTC. In order to gather more information about the physical environments offered to older people, future studies should include different settings from different providers. This reveals the similarities and deficiencies in the physical environment between settings, provides more evidence for the importance of the physical environment and encourages building supportive environments for older people.

Implications for clinical practice and research

- An increasing number of older people are suffering from long-term health conditions, such as memory disorders. It is apparent that increasing number of older people with these health conditions are residing in long-term care settings. Hence, it is essential to create physical environments that support physical and cognitive impairments. The voices of users, older people, should be heard to complete the guidelines for these environments, and these should not only be based on professional decisions.
- The instrument needs standardisation of the physical environment and thus to minimise observer bias by improving consistency of the observations. The instrument benefits from accurate comparisons between settings and is a necessity for studying the associations between environment and outcomes. Although this study focused on the appearance of different domains in the environment, the instrument can also be used to assess the quality of different locations, such as dining rooms or outdoor spaces. Furthermore, the instrument can be useful when planning new facilities or proposing new recommendations to be included in the strategic guidelines for institutional living environments.

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AUTHOR CONTRIBUTIONS

The conception and design of the study: NW, MS, RS Acquisition of data: NW, RS, MS Analysis and interpretation of data: NW, SN, RS Drafting the article: NW, SN, MS, RS Revising it critically for important intellectual content: NW, MS, SN, RS.

CONFLICT OF INTEREST

The authors declare that they have no conflicting interests.

DATA AVAILABILITY STATEMENT

The data that support the findings of the study are available from the corresponding author upon reasonable request.

ORCID

Niina Wahlroos https://orcid.org/0000-0002-0805-9440
Minna Stolt https://orcid.org/0000-0002-1845-9800
Susanna Nordin http://orcid.org/0000-0003-3356-7583
Riitta Suhonen https://orcid.org/0000-0002-4315-5550

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