Title: Development and testing of the interprofessional EduProDe scale for social and healthcare educators' continuing professional development

Abstract

Background: Social and health care educators are crucial in educating competent professionals for a fast-changing society. Previous studies assess educators' continuing professional development mostly from a single perspective. Educators' perceptions about the professional development multiple dimensions should be assessed to enhance their learning process.

Aim: To develop and validate a new interprofessional Educators' Professional Development scale for research and social and healthcare education institutes.

Method: Developing and validating the scale consisted four phases: defining continuing professional development, creating an item pool, an expert item pool review and psychometric testing of the Educators' Professional Development scale. Face and content validity were conducted by two expert panels. The initial item pool had 104 items, with 41 remaining after the expert panels. In a cross-sectional study, 2330 social and health care educators from 29 organizations were invited to participate in a self-assessment survey with a 4-point Likert scale. The response rate was 18% (n= 422).

Results: Explorative factor analysis indicated six factors with 22 items accounting for 68.37% of the variance. The factors defined different elements of continuing professional development for educators: "Need for pedagogical development" (7 items), "need to manage challenging situations in teaching" (3 items), "leadership of competence development" (3 items), "self-directed learning" (3 items), "need to develop clinical competence" (3 items) and "benefits of professional development" (3 items). Internal consistency for the six subscales ranged from .70 to .89.

Conclusion: The EduProDe scale could be applied in research and educational institutions for planning and evaluation interprofessional continuing professional development processes or programs.

Key words: continuing professional development, educator, factor analysis, health care, scale development, social care

Introduction

An aging, multi-cultural and technology-centered society is facing challenges to which the social and healthcare systems must adapt (WHO 2016). Educational institutions are expected to educate high-performing health professionals: they are required to focus on clients' multidirectional needs in an ethical and efficient way, have high motivation and new competencies (WHO 2013, WHO 2016). Strong healthcare system needs collaborative practice from work force (WHO 2010), this denotes that complex health problems might require the expertise of both social and healthcare

professionals (Siu et al. 2019, Sundström et al. 2018). Educators are key in changing fragmented healthcare system to collaborative practice with interprofessional education (Furr et al. 2020, WHO 2010).

According to Mikkonen et al. (2019), social and healthcare educators need competencies from subject, ethical, pedagogical, management and organizational, innovation and development, collaboration, cultural and linguistic, and professional development fields. In Finland, social and healthcare educators must have a professional degree in social or healthcare, three to five years' clinical experience, a Master and/or Doctoral degree and pedagogical studies for 60 ECTS (University of Applied Sciences Regulation 2014/1129, Regulation on Vocational Education Degree 680/2017). They are educating e.g nurses, midwives, public health nurses, bachelors of social work, physiotherapist and paramedics in universities of applied sciences (Government decree of the Universities of Applied Sciences 1129/2014, 2014) and practical nurses in vocational colleges (Regulation on Vocational Education Degree 680/2017).

Continuing professional development is a multi-dimensional learning process that takes place after formal education in working life and is necessary for all stages of the educator's career (Cooley & De Gagne 2016, Summers 2017). In formal education, it occurs, for example, in continuing education but also learning at work (Collin et al. 2012, Van der Rijst 2019), and it should be based on individual learning needs (Avalos 2011, McMahon 2017). Professional development is designed to increase the educators' professional expertise, wellbeing and job satisfaction and to improve students' learning and the organization's competitiveness and effectiveness (Collin 2012, McMahon 2017, Arian et al. 2018, Dymoc & Tyler, 2018, Huang Hoon 2019).

The assessment of continuing professional development has been studied from different dimensions. Educators learning and getting support during the educational program have been assessed (Baker 2010, Buusboje et al. 2017). Nurse educators have evaluated their attitudes, knowledge and skills when implementing evidence-based practices in their teaching (Youssef et al. 2018). Social educators have evaluated their critical thinking skills and challenges to use technology in education (Harnek Hall et al. 2019, Diaconu et al. 2019)). Jetha et al. (2016) have identified clinical novice nurse educators' professional development needs as pedagogical and Bay et al. (2019) have evaluated critical reflection process among social work educators after professional development workshops. McAllister et al. (2016) developed a questionnaire for nurse educators' self-assessment. The Capabilities of Nurse Educators (CONE) questionnaire measures nurse educators´capabilities and identifies professional development needs. It might also be used to evaluate professional development (McAllister et al. 2016).

Previous research has mainly produced knowledge about the single elements of professional development, such as educators' learning and assessment of attitudes, knowledge, skills and needs of professional development and from one discipline perspective. Interprofessional knowledge should be gained from a broader perspective scale, which combines information about professional development needs and self-directed learning, benefits and leadership of professional development. Planning interprofessional continuing professional development could be based on information gathered with this scale.

The aim of this study was to develop and validate a new scale, the Educators' Professional Development (EduProDe) scale, to explore social and healthcare educators' perceptions of

continuing professional development. The research questions were: 1) What is the face and content validity of the EduProDe scale and 2) What is the construct validity and reliability of the EduProDe scale?

Methods

The developing process was formed according to DeVellis's (2017) guidelines to scale development. The process had four phases: defining continuing professional development, creating an item pool, an expert item pool review and psychometric testing of the EduProDe scale.

Definition of continuing professional development

Social and healthcare educators' continuing professional development was based on the literature review (DeVellis 2017) conducted in the Cinahl, Eric, Medline, Applied Social Sciences Index (ASSIA) and Social Service Abstracts databases. The scale was based on the theoretical framework built in the literature (Oprescu et al. 2017, Vilen & Salminen 2016, Ignatavius & Chung 2016, Dickerson et al. 2014, Tanji & Ligia de Oliveira 2012, Ferreira et al. 2012) and qualitative data reported in Authors et al. (2019). The qualitative data were carried out in ten focus groups, which included 35 experienced educators from the social and healthcare fields. Data were analyzed with qualitative content analyses. Four categories were verified: professional development, continuing education needs, benefits and barriers (Authors et al. 2019).

Creating item pool

The initial item pool was constructed based on literature and qualitative results by De Von et al. (2007). Researchers had experience educating social and healthcare educators and developing their competence. There were 104 items in the initial item pool with the following subscales: continuing professional development needs, forms, benefits, barriers and leadership. At this point, the measurement format was determined. A 4-point Likert scale was chosen because it is widely used in scales measuring perceptions. Response options were strongly disagree, moderately disagree, moderately agree and strongly agree (DeVellis 2017).

Expert item pool review

The item pool validity was assessed by external experts. Four experienced educators from the one University of Applied Sciences who were familiar with educators' professional development were invited to the first expert panel. They rated the items' relevancy and clarity with a 4-point scale: not relevant/clear, needs some revision, relevant/clear but needs minor revision and very relevant/clear (De Von et al. 2007). Then they gave recommendations to reformat items. In the first review, experts rated and commented on the initial item pool; 54 items were rejected and 50 remained. Items were rejected when 2–4 experts rated item relevancy as 1 or 2 (Polit et al. 2007). The rest of the items were reformatted as needed according to their recommendations.

Three experts from one university health science education and research conducted the second expert review. They rated the items with the same scale, and the content validity index for item (I-CVI) and scale (S-CVI) were calculated (Davis 1992). All nine items for which I-CVI was 0.33 were rejected, and items with I-CVI 0.67 were reformatted according to expert recommendations. The S-CVI for different subscales was 0.82–0.92, which seems sufficient for the new scale (Polit et al. 2007). The total number of items was 41. The subscales were educators' needs for pedagogical development, needs to develop clinical expertise, needs to manage challenging situations in teaching, different forms of continuing education, educators' self-directed learning, benefits of professional development, barriers for continuing education and leadership of educators' competence development. The scale was tested in the pilot study with 34 educators (Hertzog 2008) and the Cronbach alpha of the sub-scales varied between 0.55 and 0.89 (Dixon 2005).

Psychometric testing of the EduProDe scale

Construct validity was identified with exploratory factor analysis (EFA), and reliability was evaluated with Cronbach alpha coefficient (Dixon 2005). With EFA potential, latent variables underlying a set of items and items performing poorly in the scale were identified (DeVellis 2017).

Sample

The sample size was determined by reaching the recommended 10 participants per item of the EduProDe scale construct validation (DeVon et al. 2007). This study found 19 participants per variable, which was adequate for validating the scale.

The social and healthcare educators were invited from all 21 universities of applied sciences (N=1851) and 7 randomly chosen vocational colleges (N=479) from different regions of Finland. Since Finland is a bilingual country, Swedish-speaking educators were also invited from two vocational colleges. The scale was developed in Finnish and additionally translated in to Swedish. Full- or part-time educators (N=2330) teaching in the health, social or rehabilitation fields in these institutions were invited to participate.

Ethical considerations

Researchers have followed the Finnish Advisory Board on Research Integrity guidelines for the responsible conduct of research (TENK 2012) and Helsinki Declaration (2013) principles about human participants. Under Finnish ethical guidelines for researchers, an ethical statement was not required because the study did not violate participants' integrity, it did not use data without informed consent, participants were not under 15 years old and the study did not include any security thread against them (Declaration of Helsinki 2013). All universities of applied sciences and vocational colleges involved in this study have been given research permission. Participants' voluntary response was taken as agreement to join the study. Anonymous answers were sent via a link provided in an invitation letter. The data were analyzed, and the results will be reported confidentially to maintain privacy. A data management plan for the study was designed according to guidelines of the GDPR (2016) and the Personal Data Act (523/1999). The data are stored in protected files in the university and will be archived for 50 years after completion of the project.

Data collection

Data were collected in October–December 2018 via a Webropol survey. The invitation was sent to the respective institution's contact person, who then forwarded the letter and link to the educators. The letter provided information about the study, inclusion criteria and voluntary and anonymous participation. After the first invitation, four reminders were sent to the contact persons every 3–4 weeks.

Data analysis

Data analysis was performed with SPSS Statistics 24. Demographic data were described using descriptive analysis. Explorative factor analysis was used to test the construct validity of the new subscales by identifying items that should be grouped together and that may need to be dropped from the scale (Dixon 2005). Factor analysis also helps investigate the number and content of possible latent variables (DeVellis 2017). Internal consistency reliability was measured with Cronbach's alpha coefficient when all subscales were looked at simultaneously (Dixon 2005). The preliminary data analysis was performed for missing values with Missing at Random (MAR), Missing Completely at Random (MCAR) and Missing Not at Random (MNAR). The cut-off for removing data was set at >5% of the missing data. The univariate and multivariate outliers were examined by calculating Mahalanobis distances and Mardia kurtosis index. The threshold was set at the p-value of <0.01 (Lombardini and Pastore 2012).

Results

Participants

The response rate was 18%, or 422 educators. Eighteen outliers (4%) were identified from a multivariate perspective and removed (Duffy & Jacobsen 2005), leaving a total 404 participants. Most participants were female (90%, n=365), with an average age of 51 years (SD=8.7). Most of the educators (63%, n=253) were teaching in the healthcare field, 21% (n=83) in social care, 7% (n=28) in rehabilitation, and nearly 10% (n=40) were teaching in a combined health, social care and rehabilitation field. The mean of their work experience was 14 years (SD=9.0), varying from <1 to 45 years. Educators most commonly held a Master of Health Sciences 70%, (n=284) and 21% (n=83) had a doctoral degree. Almost all 95.3% (n=402) had a pedagogical education of 60 ECTS.

Construct validity of the EduProDe scale

The scale was primarily tested with item-to-total correlation with a cut-off set <0.20 on Cronbach alpha loading (Tabachnick & Fidell 2007). Of 41 total items, 7 were identified below the cut-off and were removed as a result. Construct validity was tested with explorative factor analysis (EFA). The Kaiser-Meyer-Olkin measure .82 was higher than recommended (.80), along with Bartlett's Test of Spherity (x^2=6049.449, df=820, p<0.001). With EFA verifying the possible latent variables it was conducted with Principal Axis Factor extraction and Varimax rotation. The item cut-off in

loading was set at 0.30. After removing the cross-loading items, 22 items remained. Six factors were determined by Eigenvalue >1.0 and a scree test (DeVellis 2017).

The first factor, "educators' needs for pedagogical development," consisted of seven items comprising 27.81% of variance; "educators' needs to manage challenging situations in teaching" consisted of three items comprising 14.33% of variance; factor three, "leadership of educators' competence development," consisted of three items comprising 8.06% of variance; "educators' self-directed learning" consisted of three items comprising 6.65% of variance; "educators' needs to develop substance (subject/clinical) competence" consisted of three factors comprising 5.90% of variance; the sixth factor, "the benefits from professional development," consisted of three items comprising 5.62% of variance. These six factors with 22 items accounted for 68.37% of the total variance (Table 1).

Internal consistency reliability of the EduProDe scale

Cronbach's alpha coefficient was computed to measure internal consistency reliability for the full scale and subscales. The Cronbach alpha for the full scale was 0.89. Cronbach's alpha ≥.70 is considered acceptable for research scales and ≥.90 for clinical scales (DeVon 2007). The subscales' Cronbach's alphas are shown in Table 1.

Discussion

This study aimed to develop and validate a new interprofessional EduProDe scale to measure educators' perceptions about continuing professional development; it was shown to be reliable and valid. There were six factors and 22 items measuring different elements of social and healthcare educators' continuing professional development. The Needs Assessment for Nurse Educators was recently developed as an organization-developed self-reflective tool to assess nurse educators' skills and attitudes toward their scope of practice (Dickerson et al. 2014). The other assessment collects information about educators' responsibilities and learning needs (Johnson & Puglia 2012). The CONE questionnaire was developed to measure the complexity of the nurse educators' role. It was tested statistically and found to be reliable (McAllister 2016). The new scale is assessing the continuing professional development not only from the perspective of needs, but also from the perspectives of leadership, self-directed learning and benefits.

The first factor labeled educators' needs for pedagogical development, including their needs to increase competence in versatile teaching methods, student-centered teaching, pedagogically relevant digital technology use, simulation teaching, student evaluation, work-oriented teaching and how to carry out developing projects. McAllister and Flynn's (2016) CONE instrument about nurse educators' capabilities is fully congruent between needs to increase competence in versatile teaching methods and simulation teaching. In the EduProDe scale, there are also items from various pedagogical approaches like student centrality and evaluation; the items are formed as professional development needs, and in CONE, the assessment is more about the nurse educators' capabilities.

The second factor, "educators' needs to manage challenging situations in teaching" includes items like more skills to solve conflict situations in teaching, more competence to guide culturally diverse students and more competence to deal with students' studying problems. Taniyama et al. (2012) have also identified difficulties that clinical nurse educators and faculty face with students who have

a low level of readiness for training while Salminen et al. (2016, 2017) found that nursing students experience inequality between themselves and the educator, and they feel their educators are unfair. Harris (2018) advises nurse educators to be proactive and develop teaching strategies that support diverse learning needs, and Ingraham et al. (2018) state that diversity should be appreciated in teaching and learning environments. Brown et al. (2019) also encouraging social work educators using proactive models based on social justice when they are teaching culturally diverse students. In the CONE instrument (McAllister 2016), educators also assess their teaching relationship with students with items quite similar to the EduProDe scale.

"Leadership of educators' competence development" includes items about supporting professional development, such as a personal development plan, discussions about personal development with a superior and organizational atmosphere. Organizational support is a pivotal element of educators' professional development. Baker (2010) has shown that novice educators felt supported and valued after their orientation program, which was carried out in collaboration with faculty, and that also reduced their desire to leave. McPhee et al. (2009) state that getting support from an organization increases the educators' job satisfaction. In Ayala and Lev-Ari's (2016) study, work climate is not a single issue influencing an educator's learning; their self-efficacy and self-confidence are also crucial for learning and professional development.

The fourth factor, "educators' self-directed learning," included items where educators assessed language skills developing, conference participation and international collaboration in terms of competence developing. Self-directed learning from a different perspective was studied in Doneski's (2017) work, in which novice educators' learning was assessed. It was found that self-directed learning together with mentoring increased educators' skills and self-efficacy. Successful self-directed learning requires openness to learning opportunities and a good self-concept in addition to taking initiative and being an independent learner (Van Rensburg & Botma 2018).

The fifth factor, "educators' needs to develop clinical competence," has three items: educators from a clinical environment evaluated their needs to update clinical competence, collaboration with the clinical environment's development projects, and networking. Adelmann-Mullally et al. (2013) and Langeland and Thoresen (2013) highlight the other side of collaboration between clinical environment and academia: clinical nurse educators need mentoring and coaching from academia faculty on how to teach and develop novice nurses and nursing students. Clinical knowledge is one of the core areas in social and healthcare educators' competence (Mikkonen et al. 2019), which is self-evident because they educate professionals for practical work.

Finally, for "benefits from professional development," the items assessed educators' continuing education benefits like improved teaching skills, enhanced work well-being, maintained clinical skills. Similarly, Rogan (2014) reported that educators believed continuing professional development was beneficial for them, and Baker (2010) notes that after the orientation program, educators felt increased job satisfaction. Also, Sheppard-Law (2018) highlights the benefits of the clinical nurse educators' professional development program, which was conducted in the early stage of their career. Educators became familiar with practices and appreciated relationships with other educators.

Limitations and strengths

This study has some limitations. The response rate was quite low at 18%, but it was enough for the scale validation, which recommends 5–10 participants per item (DeVellis 2017). Similarly, in Koivula et al. (2011), the response rate was 26%. Educators had an autumn break during data collection, which might have decreased the response rate. Secondly, based on the EFA results, 19 items were removed from the 41 total items because of poor or multiple fit into categories (DeVellis 2017). The content of removed items likely defined the construct of created subscales in categories more than those forming a congruent set of items. Thirdly, most respondents were from the healthcare field, while the remainder were in the social and rehabilitation fields, which should be considered when utilizing the results. Fourthly, generalizing the professional development of educators in other countries is not recommended because the scale has not been tested in an international context.

As a strength of this study can be seen that the scale is based on self-assessment. Previous studies has been found that critical part of continuing professional development is that educator will assess individual learning needs (Silver et al. 2008, Avalos et al. 2011, McMahon et al. 2017) and learning process outcomes by him/her-self (Silver et al.2008). A self-assessment is seen as a motivating factor of continuing professional development.

Conclusion

The Educators' Professional Development (EduProDe) scale measures educators' needs, approaches, benefits and essential support from superiors concerning their professional development. Continuing professional development can be defined as a learning process where self-assessment of learning needs and support from superiors are essential. Self-directed learning is one approach for learning and the ongoing learning benefits educators work wellbeing and teaching. This is a new approach for interprofessional development that can lead to many future benefits.

The subscales may help both social and healthcare educators and superiors to recognize the multidimensionality of professional development, and the whole scale emphasizes the importance of its planning and ongoing process. More testing is needed to confirm the usefulness of the scale also among medical practitioners´ educators. The scale needs to be further validated in an international context and the English language version. It may be used as a tool when planning and evaluating interprofessional continuing professional processes or programs for educators in educational institutions.Educators' updated competencies may be one solution for facing future challenges in learning and teaching active citizens for renewing culture and society globally.

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