



## Research Article

## The influence of nurse characteristics on practice skills and attitudes towards working with families in critical care: A regression analysis

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## ABSTRACT

**Objectives:** The study aimed to identify nurse characteristics that influence their self-perceived practice skills in working with families and their attitudes towards engaging families in adult and neonatal intensive care units.

**Research methodology/Design:** Secondary data analysis using a descriptive, cross-sectional design.

**Setting:** An online survey was completed by 256 nurses from six adult intensive (73% response rate) and two neonatal intensive and one intermediate care unit (27% response rate) in a Swiss, university affiliated hospital.

**Main outcome measures:** Nurses' self-perceived practice skills in working with families were assessed with the "Family Nursing Practice Scale". Attitudes towards families were measured with the "Families' Importance in Nursing Care – Nurses' Attitudes Scale". Data were analysed with multiple linear regression models.

**Results:** Prior education in family nursing significantly influenced nurses' self-perceived practice skills in working with families. Nurses' clinical speciality had a significant influence on their attitudes towards overall, and on the subscale "family as a burden". Neonatal intensive care nurses showed more open attitudes towards families overall, but perceived family more often as a burden than nurses in adult intensive care. Nurses' perceived skills and attitudes in family engagement significantly influenced each other.

**Conclusion:** The results suggest that nurses' prior education in family nursing and clinical speciality determine their ability to work with and engage families in critical care. Our study suggests that integration of family nursing engagement practices in critical care requires educational implementation strategies combined with culture change efforts.

### Implications for clinical practice

- Educating nurses in how to engage and partner with families who experience critical illness is key to build their capacity for and skills in working with families.
- Culture change efforts at the team and organisational level may be necessary to promote open attitudes towards engaging families in care, especially in nursing staff on adult intensive care units, whereas limited research exist but may provide positive outcomes.
- Providing support to nurses for handling stressful family situations and to enable them to feel safe and in control even when families are present at the bedside is called for, particularly in the neonatal intensive care units.

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## Introduction

The critical illness of a close other involves uncertainty and a loss of control. High psychological distress during critical illness has been described for families of adults and neonates alike (Alfheim et al., 2019; Gooding et al., 2011; Minton et al., 2019; Woodward et al., 2014). Such difficult illness experiences often result in negative long-term consequences for families (Staver et al., 2019; van Beusekom et al., 2015).

Family engagement and support denotes best practice in critical care (Davidson et al., 2017). Recommended family engagement practices include, for example: Enabling family presence in the neonatal and adult intensive care units, also during rounds and invasive procedures, providing information to and communicating with the family, involving the family in care tasks and decision-making, and providing emotional and practical support (Goldfarb et al., 2020; Heydari et al., 2020; McAndrew et al., 2020; Olding et al., 2016; Ramezani et al., 2014). Research findings have demonstrated positive outcomes of family engagement practices in adult intensive care units (ICU), such as reduction of patients' anxiety symptoms, delirium, and length of stay (Lee et al., 2019; Nassar Junior et al., 2018; Sims and Miracle, 2006). Preterm infants in the neonatal intensive care unit (NICU) with regular parental physical contact showed positive outcomes in a wide variety of neonatal outcomes such as mortality or breastfeeding (Boundy et al., 2016). Overall, family engagement leads to greater satisfaction, increased mental wellbeing in families, and better-informed family members (Goldfarb et al., 2017; O'Brien et al., 2018; Segers et al., 2019; White et al., 2018).

Nurses play a key role in supporting family members through health and illness (Adams et al., 2014; Reis et al., 2010; Vandall-Walker and Clark, 2011). Nurses' skills and empowerment to work with families and their attitudes towards families seem to be important determinants of nurse-family engagement practices (Eggenberger and Sanders, 2016; Hetland et al., 2018; Lloyd et al., 2018; Naef et al., 2020; Svavarsdottir et al., 2018; Maatman et al., 2020).

Research suggests that family engagement practices have not yet been sufficiently established in routine critical care delivery (Hetland et al., 2018; Kleinpell et al., 2018). Organisational barriers to implementation include time pressures, lack of physical space for the family or insufficient leadership support, whereas barriers at the individual nurse level include lack of skills in family engagement, disruption in workflow, or feeling observed through families' presence (Hamilton et al., 2020; Kiwanuka et al., 2019; Kleinpell et al., 2018). An increased understanding of enabling and limiting factors of family engagement practices within critical care nursing is necessary (Hetland et al., 2018; Kleinpell et al., 2018; Naef et al., 2021a; Raiskila et al., 2016).

Previous research has found inconsistent results regarding the influence of nurse education level, gender, years of work experience, experience with illness in own family, or family-centred approach at workplace, on nurses' skills or their attitudes towards families (Hagedoorn et al., 2021; Luttik et al., 2017; Østergaard et al., 2020; Rahmqvist Linnarsson et al., 2015; Svavarsdottir et al., 2018). Despite some initial insights into nurse-related determinants on family engagement, more research is needed to better understand the influence of nurse characteristics in family engagement practices in acute-critical care settings. Specifically, more research on the influence of nurse characteristics on self-perceived skills in working with families and attitudes towards engaging and supporting families in critical care units is needed for tailored implementation and quality improvement efforts.

## Methods

### Objectives

The study aimed to examine the impact of critical care nurse characteristics on self-perceived practice skills in working with families and attitudes towards engaging families.

### Study design, setting and participants

We used a descriptive, cross-sectional study design. Data reported in this study were collected as part of a previous larger study investigating family nursing in ICU and NICU (Maier et al., 2020; Naef et al., 2020). The parent study took place in six ICUs, two NICUs and one intermediate care unit in a major university hospital in the German speaking part of Switzerland. A total of 471 registered nurses from nine units, who had been working there for at least six months were invited to take part in the study through completion of an online survey.

G\*Power (Faul et al., 2009) showed that with an effect size of weak to medium ( $f^2 = 0.1$ ), with 18 predictors, a power of 0.8 with below significance level of 0.05, the minimum sample size for multiple regression was predicted to be 217 data sets.

### Ethical approval

The Ethics Committee of the Canton Zurich waived the need for approval (Req-2016-00557; Req-2018-00107). The return of a completed survey was taken as informed consent.

### Data collection

Data were collected from December 2016 to January 2017 in NICU and from March 2018 to May 2018 in adult ICUs using an electronic data capture system (REDCap; <https://www.project-redcap.org>). Potential participants were invited by email, which entailed the study information pack and a link to the online survey.

### Nurse characteristics (independent variables)

A brief form was used to assess demographic and professional nurse characteristics: clinical speciality (ICU/NICU), sex (male/female), age (in years), level of highest degree (diploma-prepared/ICU certification/baccalaureate or higher), years of work experience (in years), prior education in family nursing (yes/no), experience with illness in own family and family-centred approach at workplace (yes/no).

### Nurses' practise skills in working with families (dependent variable)

The 10-item German version of the "Family Nursing Practice Scale" (FNPS) was used to assess nurses' appraisal of practise skills and their reflexion in working with families (<https://fnps.info>; Naef et al., 2021b; Simpson and Tarrant, 2006). Items are scored on a 5-point Likert-type scale ranging from one (high level) to five (low level). Lower mean score represents higher practice skills. This questionnaire was validated in critical care, suggesting high internal consistency (Cronbach's alpha of 0.84) (Naef et al., 2021b). In the current sample, Cronbach's alpha values for total was 0.83.

### Nurses' attitudes towards engaging families (dependent variable)

The 19-item German version of the "Families' Importance in Nursing Care – Nurses' Attitudes Scale" (FINC-NA) (Naef et al., 2021c; Saveman et al., 2011) was used to measure nurses' attitudes towards the importance of involving families in care. In addition to the total scale (ranging from 19 to 95), the FINC-NA consists of four different subscales and is scored on a 5-point Likert-type scale ranging from one (totally inaccurate) to five (completely true): Family as a partner in care measures whether nurses invite family members to take part in care (Fam-P; 6 items, score from 6 to 30); Family as resource in nursing care asks whether the presence of family members is a benefit to the process (Fam-RNC; 7 items, score from 7 to 35); Family as their own resources contains questions to find out whether the family is seen as a part of the system that needs nurses' support (Fam-OR; 3 items, score from 3 to 15); Family as a burden includes questions to measure nurses' stress in the presence

of the family (Fam-B; 3 items, score from 3 to 15). A high score indicates an open attitude towards families. FINC-NA was validated in critical care setting and showed high internal consistency with a Cronbach's alpha of 0.86 for the total scale and between 0.67 and 0.78 for subscales (Naef et al., 2021c). In the current sample, Cronbach's alpha values for total was 0.84, and between 0.70 and 0.87 for the subscales.

Data analysis

Statistical analyses were performed using IBM SPSS 27.0. To determine group differences between nurses working in adult and neonatal ICU, two-tailed independent Mann-Whitney-U-tests or chi-square tests were performed according to the level of data for characteristics and endpoints.

The influence of nurse characteristics on self-perceived practice skills and attitudes was analysed with six separate, explorative regression models with enter method, using the FNPS, the FINC-NA total and the four subscale as dependent variables. Assumptions were checked with the Gauss-Markov Theorem (Urban and Mayerl, 2011). Multicollinearity was identified with the Tolerance Index (accepted values >0.1) and autocorrelation was excluded with the Durbin-Watson test (accepted values between 1.5 and 2.5). The influence of outliers was identified with Cook's distance (accepted values ≤1). To verify heteroskedasticity, the Breusch-Pagan test was used (accepted p >.05).

Effect sizes (R-squared and f-squared statistics) for Mann-Whitney-U tests and for the separate multiple regressions were reported according to Cohen (1992) with R<sup>2</sup> = 0.02 and f<sup>2</sup> = 0.02 indicating a small effect size, R<sup>2</sup> = 0.13 and f<sup>2</sup> = 0.15 indicating a medium effect size, and R<sup>2</sup> = 0.26 and f<sup>2</sup> = 0.35 indicating a large effect size. A significance level of α = 0.05 was used for all statistical analysis.

Results

Nurse characteristics

A total of 256 nurses returned a completed questionnaire, 187 from adult ICU (response rate of 73%) and 69 from the NICU (response rate of 27%). Nurse characteristics are displayed in Table 1.

When comparing adult ICU and NICU nurses, there were significant differences for most of the independent variables (p < 0.01), except for prior education in family nursing and experience with illness in their own family. Self-perceived skills (p = 0.032) and attitudes (p < 0.001) also differed to a statistically significant degree, with nurses from adult ICU feeling less skilled and open towards engaging with families than nurses working in NICU (see Table 1).

Nurses' skills in working with families

In the first regression model with the FNPS as dependent variable (n = 251), the nurse characteristic prior education in family nursing (p <.001) and nurses' attitudes towards families (p <.001) significantly influenced nurses' skills in working with families (see Table 2). The model explained 41% (adjusted R<sup>2</sup>) of the variance in nurses' practice skills in family engagement with a large effect size (f<sup>2</sup> = 0.758).

Prior education in family nursing was significantly associated with better practice skills in family nursing, and less supportive attitudes towards families were significantly associated with lower skills. In this model, nurses' attitudes towards families had the highest significant effect on nurses' practice skills in working with families.

Nurses' attitudes towards engaging families

In the second regression model with the FINC-NA total scale (n = 251), nurses' clinical speciality (ICU/NICU; p =.026) and nurses' skills in working with families (p <.001) significantly influenced their attitudes towards families (see Table 3). The model explained 40% (adjusted R<sup>2</sup>) of

Table 1 Participant characteristics.

	Overall	ICU <sup>1</sup>	NICU <sup>2</sup>	Test statistics
N (%)	256 (100)	187 (73)	69 (27)	
Sex, n (%)				χ <sup>2</sup> (1) = 8.961**
Female	219 (85.5)	152 (81.3)	67 (97.1)	
Age (yrs), M ± SD, Mdn (min.–max.)	39.7 ± 9.9, 38.5 (21–62)	40.9 ± 9.1, 40 (23–62)	36.2 ± 11, 33 (21–60)	z = -3.595***
Highest degree, n (%)				χ <sup>2</sup> (2) = 92.139***
Diploma-prepared	57 (22.3)	17 (9.1)	40 (58.0)	
ICU certification	158 (61.7)	147 (78.6)	11 (15.9)	
Baccalaureate or higher	41 (16.0)	23 (12.3)	18 (26.1)	
Work experience (yrs), M ± SD, Mdn (min.–max.)	18.3 ± 10, 18 (0–43)	20.1 ± 8.9, 20 (1–43)	13.7 ± 11.5, 10 (0–43)	z = -4.491***
Prior education in family nursing, n (%)				χ <sup>2</sup> (1) = 0.940
Yes	34 (13.3)	22 (11.8)	12 (17.4)	
Experience with illness in own family, n (%)				χ <sup>2</sup> (1) = 3.09
Yes	172 (67.2)	132 (70.6)	40 (58.0)	
Family-centred approach at workplace, n (%)				χ <sup>2</sup> (1) = 34.734***
Yes	165 (64.5)	100 (53.5)	65 (94.2)	
Nurses' skills (FNPS mean score) <sup>3</sup> , M ± SD, Mdn (min.–max.)	2.5 ± 0.6, 2.5 (1.1–4.4)	2.5 ± 0.6, 2.5 (1.1–4.4)	2.4 ± 0.5, 2.3 (1.2–4.2)	z = -2.138*
	n = 254	n = 187	n = 67	
Nurses' attitudes (FINC-NA total scale) <sup>4</sup> , M ± SD, Mdn (min.–max.)	64.3 ± 10.1, 64 (39–89)	62.7 ± 10.3, 62 (39–89)	68.7 ± 8.2, 70 (48–89)	z = -4.289***
	n = 251	n = 184	n = 67	

N = Number, M = Mean, SD = Standard Deviation, \*p ≤ 0.05, \*\*p ≤ 0.01, \*\*\*p ≤ 0.001  
 \*p <.05, \*\*p <.01, \*\*\*p <.001  
<sup>1</sup> Adult intensive care units  
<sup>2</sup> Neonatal intensive care units  
<sup>3</sup> FNPS = "Family Nursing Practice Scale", mean score ranging from 5 = low skill to 1 = high skill.  
<sup>4</sup> FINC-NA = "Families' Importance in Nursing Care – Nurses' Attitudes", total scale ranging from 19 = less supportive attitude to 95 = open attitude towards families.

the variance in nurses' attitudes with a large effect size (f<sup>2</sup> = 0.724). Nurses in NICU had more open attitudes towards families than did nurses in ICU, and a more open attitude was associated with better practice skills. Nurses' practice skills had the highest significant effect in this model (β = -0.569).

Family as a burden

In the third regression model with the subscale Fam-B of the FINC-NA (n = 254), nurses' clinical speciality (p <.001) and nurses' skills in

**Table 2**  
Nurses' skills in working with families (FNPS).

Independent Variables	B	SE B	Standardized B	t
Intercept	4.515	0.269		16.775***
Age	-0.002	0.007	-0.026	-0.231
Sex, female (ref.: male)	0.019	0.085	0.011	0.220
Clinical speciality, NICU (ref.: ICU)	0.157	0.084	0.121	1.865
Highest degree, ICU certification (ref.: diploma-prepared)	0.130	0.091	0.109	1.428
Highest degree, baccalaureate or higher (ref.: diploma-prepared)	-0.056	0.101	-0.035	-0.555
Work experience (yrs)	-0.002	0.007	-0.037	-0.322
Family-centred approach at workplace (ref.: no approach)	-0.072	0.065	-0.060	-1.114
Prior education in family nursing (ref.: no prior education)	-0.330	0.089	-0.194	-3.721***
Experience with illness in own family (ref. no experience)	0.062	0.061	0.050	1.001
Nurses' attitudes (FINC-NA total scale) <sup>1</sup>	-0.032	0.003	-0.558	-10.557***

$F(10) = 18.166, p < .001, n = 251, R^2 = 0.431, \text{Adjusted } R^2 = 0.407, f^2 = 0.758$   
 Dependent variable: Nurses' skills (FNPS mean score)<sup>2</sup>  
 \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$   
<sup>1</sup> FINC-NA = "Families' Importance in Nursing Care - Nurses' Attitudes", total scale ranging from 19 = less supportive attitude to 95 = open attitude towards families.  
<sup>2</sup> FNPS = "Family Nursing Practice Scale", mean score ranging from 5 = low skill to 1 = high skill.

**Table 3**  
Nurses' attitudes towards engaging families (FINC-NA total scale).

Independent Variables	B	SE B	Standardized B	t
Intercept	83.149	4.556		18.250***
Age	0.077	0.117	0.074	0.656
Sex, female (ref. male)	2.062	1.503	0.071	1.372
Clinical speciality, NICU (ref. ICU)	3.326	1.489	0.145	2.233*
Highest degree, ICU certification (ref. diploma-prepared)	-1.517	1.614	-0.073	-0.940
Highest degree, baccalaureate or higher (ref. diploma-prepared)	-0.621	1.790	-0.022	-0.347
Work experience (yrs)	-0.028	0.119	-0.028	-0.236
Family-centred approach at workplace (ref. no approach)	1.163	1.146	0.055	1.015
Prior education in family nursing (ref. no prior education)	-1.155	1.615	-0.039	-0.715
Experience with illness in own family (ref. no experience)	1.389	1.089	0.065	1.275
Nurses' skills (FNPS) <sup>1</sup>	-9.995	0.947	-0.569	-10.557***

$F(10) = 17.347, p < .001, n = 251, R^2 = 0.420, \text{Adjusted } R^2 = 0.395, f^2 = 0.724$   
 Dependent variable: Nurses' attitudes (FINC-NA total scale)<sup>2</sup>  
 \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$   
<sup>1</sup> FNPS = "Family Nursing Practice Scale", mean score ranging from 5 = low skill to 1 = high skill.  
<sup>2</sup> FINC-NA = "Families' Importance in Nursing Care - Nurses' Attitudes", total scale ranging from 19 = less supportive attitude to 95 = open attitude towards families.

**Table 4**  
Family as a burden (Fam-B; FINC-NA subscale).

Independent Variables	B	SE B	Standardized B	t
Intercept	12.452	1.354		9.198***
Age	0.031	0.035	0.100	0.878
Sex, female (ref. male)	0.413	0.439	0.048	0.941
Clinical speciality, NICU (ref. ICU)	-4.460	0.443	-0.654	-10.065***
Highest degree, ICU certification (ref. diploma-prepared)	-0.396	0.480	-0.064	-0.824
Highest degree, baccalaureate or higher (ref. diploma-prepared)	-0.463	0.533	0.056	-0.869
Work experience (yrs)	-0.015	0.035	-0.050	-0.422
Family-centred approach at workplace (ref. no approach)	-0.271	0.339	-0.043	-0.801
Prior education in family nursing (ref. no prior education)	-0.031	0.481	-0.004	-0.065
Experience with illness in own family (ref. no experience)	-0.358	0.325	-0.056	-1.103
Nurses' skills (FNPS) <sup>1</sup>	-0.837	0.281	-0.160	-2.975**

$F(10) = 17.234, p < .001, n = 254, R^2 = 0.415, \text{Adjusted } R^2 = 0.391, f^2 = 0.709$   
 Dependent variable: Family as a burden (Fam-B; FINC-NA subscale)<sup>2</sup>  
 \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$   
<sup>1</sup> FNPS = "Family Nursing Practice Scale", mean score ranging from 5 = low skill to 1 = high skill.  
<sup>2</sup> FINC-NA = "Families' Importance in Nursing Care - Nurses' Attitudes", total scale ranging from 19 = less supportive attitude to 95 = open attitude towards families. 6 to 30 for subscale family as a partner in care (Fam-P), 7 to 35 subscale family as resource in nursing care (Fam-RNC), 3 to 15 subscale family as their own resource (Fam-OR) and 3 to 15 subscale family as burden (Fam-B)

working with families ( $p = .003$ ) significantly influenced the FINC-NA subscale family as a burden (see Table 4). The model explained 39% (adjusted  $R^2$ ) of the variance from this subscale with a large effect size ( $f^2 = 0.709$ ).

NICU nurses more often perceived the family as a burden than did ICU nurses. Perceiving the family as a burden was associated with lower practice skills. Nurses' clinical speciality had the highest effect in this model ( $\beta = -0.654$ ).

*Family as partner in care*

In the fourth regression model ( $n = 253$ ), nurses' clinical speciality (ICU/NICU;  $p < .001$ ) and skills in working with families ( $p < .001$ ) significantly influenced the FINC-NA subscale family as partner in care (supplementary file 2). The model explained 57% (adjusted  $R^2$ ), of the variance in this subscale with a large effect size ( $f^2 = 1.433$ ).

Nurses in NICU demonstrated 7 points more in this subscale (range from 6 to 30 points) than did nurses in ICU, suggesting that nurses in NICU had more open attitudes towards performance in the subscale family as a partner in care. One point more in the FNPS meant 3.4 points less in family as partner in care, and better practice skills were associated with a more open attitude towards the family as a partner in care. Clinical speciality had the highest significant effect in this model ( $\beta = 0.592$ ).

*Family as their own resource*

In the fifth regression model ( $n = 253$ ), nurses' clinical speciality (ICU/NICU;  $p = .034$ ) and nurses' skills in working with families ( $p < .001$ ) significantly influenced the FINC-NA subscale family as their own resource (supplementary file 3). The model explained 22% (adjusted  $R^2$ ) of the variance from this subscale with a medium effect size ( $f^2 = 0.326$ ).

Nurses in NICU demonstrated 0.7 points more in this subscale than nurses in ICU, which showed that nurses in NICU were more open towards families as their own resource. If the FNPS score increased by one point, this subscale (range from 3 to 15 points) decreased by 1.7 points, which indicated that an open attitude towards family as their own resource was associated with better skills. Nurses' practice skills had the highest effect in this model ( $\beta = -0.475$ ).

#### *Family as resource in nursing care*

In the sixth regression model ( $n = 253$ ), *nurses' skills in working with families* ( $p < .001$ ) influenced the FINC-NA subscale *family as resource in nursing care* (refer to [supplementary file 4](#)). The model explained 26% (adjusted  $R^2$ ) of the variance from this FINC-NA subscale with a medium effect size ( $f^2 = 0.403$ ).

Nurses performing one point more in the FNPS demonstrated 4.2 points less in this subscale (range from 7 to 35 points), suggesting that better practice skills were associated with more open attitudes towards the family as a resource in nursing care. The significant effect of nurses' skills in this model was  $\beta = -0.484$ .

#### **Discussion**

The current study with over 200 critical care nurses demonstrates that prior education in family nursing explains most of the variance in nurses' self-perceived practice skills in working with families, and clinical speciality in nurses' attitudes towards engaging families. All other nurse characteristics were non-significant. This study provides data-based insights on person- and context-related factors that shape ICU nurses' capacity to provide family care according to best practice recommendations ([Davidson et al., 2017](#)). Such knowledge is needed to inform capacity-building of the nursing workforce for, and tailor implementation of evidence-based family nursing practices in critical care contexts ([Kleinpell et al., 2019](#); [Maree et al., 2017](#)).

We found a statistically significant relationship between prior education in family nursing, such as a course or module, and self-perceived practice skills in working with families. This is in line with previous research, which shows that prior education in family nursing positively impacts on self-perceived skills ([Eggenberger and Sanders, 2016](#); [Svavarsdottir et al., 2018](#)). Research focusing on educating and training nurses in family nursing as part of their professional development or family nursing implementation projects, in contrast, has found mixed results ([Beierwaltes et al., 2020](#); [Broekema et al., 2018](#); [Eggenberger and Sanders, 2016](#); [Naef et al., 2020](#)). A recent review however, found that family nursing educational programmes were effective in developing nurse skills and attitudes, which confirms our findings ([Gutiérrez-Alemán et al., 2021](#)). Our findings, together with others, suggests that family nursing knowledge may need to be consistently included in nursing curricula to prepare a nursing workforce that is well prepared to engage and support families in critical care settings ([Kleinpell et al., 2019](#); [Maree et al., 2017](#)). Educational programs as part of professional development may also play a role, however, our findings do not allow to draw conclusions on the type of education required to ensure an open, skilled family nursing workforce in critical care setting.

In our study, nurses' clinical speciality or setting statistically determined nurses' attitudes towards engaging families, which were more open in the NICU. This is in line with other studies comparing nurses' attitudes between paediatric and adult settings ([Hetland et al., 2017](#); [Sveinbjarnardottir et al., 2011](#)). While we are unable to explain this variance based on our data, there are potential explanations for NICU nurses' openness towards family engagement. First, in paediatric care settings, a culture change towards more inclusive and participatory policies towards parents and important close others has occurred much earlier than in adult settings ([Banerjee et al., 2018](#); [Gooding et al., 2011](#); [Shields et al., 2012](#)). Second, sound evidence exists that family presence has positive effects on various short-term physical infant outcomes such

as mortality, breastfeeding, or risk of infection ([Boundy et al., 2016](#); [Franck et al., 2020](#); [Murphy et al., 2021](#); [O'Brien et al., 2018](#); [Treyvaud et al., 2021](#); [Yu et al., 2017](#)). However, the long-term effects on infant development beyond 6 months of family involvement in NICU remain less clear ([Moe et al. 2022](#)). Even though positive effects of family presence and involvement on adult patients' conditions, including anxiety, delirium, or length of stay, has been reported ([Fumagalli et al., 2006](#); [Lolaty et al., 2014](#); [Mitchell et al., 2017](#)), the evidence base is less strong. Along the same line, research has demonstrated that family involvement and engagements decrease parental distress ([Haime-Schlagel and Walsh, 2015](#); [O'Brien et al., 2013](#); [O'Brien et al., 2018](#)), whereas research of the benefit of family interventions and engagement in adult populations for family member health require further substantiation ([Kiwunuka et al., 2022](#); [Zante et al., 2020](#)). The differences in care cultures and in evidence may serve as potential explanations to the variance in attitudes towards engaging families between NICU and adult ICU nursing staff. The promotion of a care culture that is inclusive of and enables partnership with families is therefore important, particularly in adult settings.

Interestingly, nurses in the NICU experienced families more often as a burden than did nurses in adult ICU. One explanation may be that family presence and involvement in care may challenge nurses to rethink their roles and responsibilities, moving away from controlling to sharing care with parents and family members ([Mirlashari et al., 2020](#)). Previous findings showed that nurses often feel uncertain and controlled in the presence of family members ([Kleinpell et al., 2018](#); [McConnell and Moroney, 2015](#)). [Giannini and colleagues \(2013\)](#) even found that the liberalisation of open visitation policies was associated with an increase in staff members' burnout level. Support to nurses for handling stressful family situations and to enable them to feel safe and in control even when families are present at the bedside is called for, particularly in the NICU.

All regression models showed a strong association between self-perceived practice skills and attitudes, which has been previously found ([Hsiao and Tsai, 2015](#)). Based on our analyses, the direction of the effect cannot be determined, and should be investigated in future research.

While prior research found mixed results regarding the influence of nurse characteristics, such as highest degree, gender, family-centred approach at workplace, work experience or experience with illness in own family on nurses' skills or their attitudes ([Hagedoorn et al., 2021](#); [Luttik et al., 2017](#); [Østergaard et al., 2020](#); [Rahmqvist Linnarsson et al., 2015](#); [Svavarsdottir et al., 2018](#)), in our study, these characteristics showed no significant influence.

#### **Limitations**

The present study was based on a self-selected convenience sample of nurses working in an acute critical setting, which could have caused some bias because respondents could have certain characteristics such as an interest in family nursing. The sample was unequally distributed in the characteristics of the ICU and NICU nurses, which could lead to distortions in our results. Hence, it is possible that our findings do not capture the full range of nurses' characteristics. This limits the transferability of the findings to other settings and hospital contexts. Nevertheless, in two regression models, the significant difference between the two groups disappeared when the influence of the other factors was considered.

#### **Conclusion**

This study, which investigated the influence of nurse characteristics on family nursing practice skills and attitudes towards engaging families, suggests that critical care nurses in adult and neonatal care settings may benefit from specific education and training in family nursing and engagement practices. A better understanding of how to build nurses'

capacity to provide best practice in family care is an important priority for nursing education, as well as for professional development (Deatrick, 2017; International Family Nursing Association, 2013; National Academies of Sciences, Engineering and Medicine, 2016). While nurses in the NICU exhibit more open attitudes towards engaging families, they also feel more burdened by families' presence than nurses working with adult populations do. Promoting a culture of openness and participatory engagement is therefore needed, particularly in adult ICU settings. Enabling nurses to collaborate with family who is present at the bedside and supporting their skill development in involving families in care may also be needed. Future research that explores not only the influence of individual nurse characteristics, but seeks to better understand the impact of team and organisational determinants on family care provision in critical care will enable tailored implementation of family engagement practices.

### Ethical approval

The Ethics Committee of the Canton Zurich waived the need for approval (Req-2016-00557; Req-2018-00107). The return of a completed survey was taken as informed consent.

### CRedit authorship contribution statement

**Anja Zwicky:** Methodology, Software, Validation, Formal analysis, Data curation, Writing – original draft, Supervision. **Qendresa Thaqi:** Writing – review & editing. **Hannele Hediger:** Methodology, Software, Validation, Formal analysis, Data curation, Writing – original draft, Visualization. **Rahel Naef:** Conceptualization, Methodology, Software, Validation, Investigation, Resources, Writing – original draft, Project administration.

### 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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### Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.iccn.2022.103261>.

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