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# Turkish adaptation and validation of the EMpowerment of PArents in THE Intensive Care (EMPATHIC-30) questionnaire to measure parent satisfaction in Neonatal Intensive Care Units

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1 **Turkish adaptation and validation of the EMpowerment of PArnts in THe**  
2 **Intensive Care (EMPATHIC-30) questionnaire to measure parent**  
3 **satisfaction in Neonatal Intensive Care Units**

4  
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20 **Conflict of interest statement**

21 The authors declare that the research was conducted in the absence of any commercial or  
22 financial relationships that could be construed as a potential conflict of interest  
23

24 **Author contribution statement**

25 OT contributed to the design of the study, contributed to data collection, data analysis and  
26 interpretation, drafted the first manuscript. HZ contributed to data collection, data analysis  
27 and interpretation, provided revisions to early drafts. NÇ contributed to data collection, data  
28 analysis and interpretation, provided revisions to early drafts. MU contributed to data  
29 collection, data analysis and interpretation, provided revisions to early drafts. JML  
30 contributed to the design of the study, drafted the first manuscript. All authors contributed,  
31 read and approved the final manuscript.

32 **ABSTRACT**

33 **Aim:** The aim of this study was to translate and validate the shortened version of the  
34 ‘EMpowerment of PArnts in THE Intensive Care’ (EMPATHIC-30) questionnaire into  
35 Turkish to measure parent satisfaction in the Neonatal Intensive Care Units (NICU)

36 **Method:** The study used a cross-sectional design. The data of the study were collected from  
37 parents with infants staying in the NICU of a training and research hospital in Sakarya, Turkey,  
38 between July 2018-2019 after obtaining ethical approval. Totally, 238 parents (234 mothers, 4  
39 fathers) agreed to participate in the study and completed the questionnaire. Of these, 35 mothers  
40 were recruited two weeks later for the test-retest reliability analysis. The questionnaire was  
41 translated using back and forward translation. Reliability and validity test were performed to  
42 measure the psychometric properties of the Turkish EMPATHIC-30.

43 **Results:** The mean age of the parents was 28.27 (SD 5.93), and 48.3% of them were primary  
44 school graduates. The infants: 55.9% were male, the mean gestational age was 36.89 (SD 3.25)  
45 weeks, and mean length of hospital stay was 9.36 (SD 10.17) days. The mean scores of each  
46 item with a six-point scale of the EMPATHIC-30 questionnaire ranged between 4.01 and 4.87.  
47 The Cronbach’s alpha of the total questionnaire was 0.95. Cronbach’s alpha of the five domains  
48 (Information, Care and Treatment, Organization, Parent Participation and Professional  
49 Attitude) ranged between 0.80 and 0.92. Pearson correlation coefficient between the domains  
50 and total questionnaire was  $r=0.988$ . The Intraclass Correlation Coefficient was 0.998 in the  
51 test-retest evaluation. Confirmatory factor analysis was performed for construct validity and  
52 was moderate; Comparative Fit Index=0.792, Tucker–Lewis Index=0.770, Standardized Root  
53 Mean Square Residual= 0.0811, and Root Mean Square Error of Approximation=0.107.

54 **Conclusion:** The Turkish version of EMPATHIC-30 has adequate psychometric properties.  
55 The EMPATHIC-30-Turkish questionnaire is an easy and appropriate instrument which can be  
56 used to measure satisfaction of Turkish parents with infants staying in the NICU.

57

58 **Keywords:** EMPATHIC-30; Parents; Infants; Satisfaction; Neonatal Intensive Care Unit;  
59 Reliability; Validity.

60

61 **Contribution to the field**

62 Family-centered care practices not only increase parental satisfaction but also improve the  
63 quality of care. A search of the literature revealed that there are no questionnaires available to  
64 measure parent satisfaction among Turkey parents in the NICU. The EMPATHIC-30  
65 questionnaire is widely used in many countries to measure family satisfaction. Our findings are  
66 in line with previous investigations of the adaptation of EMPATHIC-30 in other languages. It  
67 seems that the EMPATHIC-30 instrument can be applied to measure parental satisfaction and  
68 can be adapted in different cultural and linguistic backgrounds.

69 **INTRODUCTION**

70 The hospitalization of an infant in a neonatal intensive care unit (NICU) is a stressful situation  
71 for both parents and the infant (1). This may affect the family's daily routines and may lead to  
72 changes in their roles and responsibilities in the family environment (2). Besides these changes  
73 in the family environment, not knowing the NICU environment, encountering medical devices,  
74 and changing duties in the care of their infant can cause anxiety and fear among parents and  
75 family members (3).

76  
77 Family-Centered Care (FCC) interventions have been developed and implemented to minimize  
78 stress and anxiety experienced by parents and accelerate the healing process of infants (4, 5).  
79 An important element in maintaining the FCC approach is effective communication.  
80 Furthermore, developing mutual trust, reducing conflict, minimizing stress levels of parents  
81 and improving parental satisfaction are components of FCC (6,7,8). It is known that parents  
82 whose have experienced an admission of their infant in the NICU need information on many  
83 issues during admission, at discharge and when at home after hospital discharge. These  
84 information needs can be clustered in five themes: communication, parental role clarity,  
85 emotional support, information resources and financial resources (9). Studies exploring  
86 problems of parents with premature infants in the NICU identified that parents experienced  
87 difficulties in bonding with their infant, breastfeeding, being worried when separated from their  
88 infant and difficulties with information and communication with healthcare professionals (10,  
89 11).

90  
91 Implementing the principles of FCC can reduce hospital length of stay, improve the bonding  
92 between parents and infants, and increase parent satisfaction (8, 12). Parental satisfaction is  
93 used as an indicator to measure quality of care and the use of satisfaction surveys is an effective  
94 method for evaluating health services (13). Currently, there are no validated parent satisfaction  
95 instruments available for parents in Turkish NICUs. Although the 65-item EMPATHIC-N has  
96 been developed and tested specifically for parents in the NICU, there is no short version of this  
97 questionnaire (14). To reduce the burden of parents we preferred a shorter version and therefore  
98 opted for the short version of the EMPATHIC questionnaire, the EMPATHIC-30 (14,15).  
99 Therefore, the aim of this study was to translate, culturally adapt, and validate the EMPATHIC-  
100 30 questionnaire to measure parent satisfaction in Turkish NICUs.

101  
102 **MATERIALS AND METHODS**

103 **Design**

104 The study used a cross-sectional descriptive design. Ethical approval was obtained from the  
105 hospital research ethics committee (02/04 /2018-72) and written consent was obtained from the  
106 parents who participated in the study. Data collection was performed between July 2018 and  
107 July 2019.

108  
109 **Setting**

110 The study setting was at the NICU of the Sakarya Training and Research Hospital in the west  
111 of Turkey. The tertiary NICU serves the province of Sakarya. The NICU has a capacity of 29  
112 beds: one level III unit with 18 beds, one level II unit with nine beds, and one level I unit with  
113 six beds. The level III unit admits infants with a birth weight <1500 grams, the level II unit  
114 admits infants with a birth weight between 1500-2500 grams and the level I unit has infants  
115 >2500 grams. Parents can visit the NICU once a day between 15.00-16.00. Before the infant's  
116 discharge, mothers are invited to stay 24 hours during the final two to three days of admission  
117 while being accommodated in the parent guesthouse of the hospital. During these days, parents  
118 receive specific training and involvement of care before going home with the infant.

119

## 120 **Participants**

121 Annual admission rate of the NICU is around 900 infants. Parents were selected with simple  
122 random sampling selection according to the inclusion criteria. Inclusion criteria were: mothers  
123 or fathers whose infants stayed in the NICU for at least two days and speak and understand  
124 Turkish. During the study period, 260 parents were invited. Of these, 22 parents declined the  
125 invitation. The final study sample consisted of 238 parents (234 mothers, 4 fathers) who agreed  
126 to participate in the study, provided written consent and completed the questionnaire. Of these  
127 study participants, 35 mothers agreed to be contacted for the test-retest of the Turkish  
128 EMPATHIC-30 questionnaire.

129

## 130 **EMPATHIC-30 questionnaire**

131 The EMPATHIC-30 questionnaire consists of three parts (16). The first part includes  
132 demographic questions such as parent's age, education level, income level, number of children  
133 in the family, and working status. Furthermore, mother's type of birth, number of pregnancies,  
134 birth / postpartum problem status and characteristics of the infants such as infant's gender,  
135 gestational week, days of NICU stay, and feeding type have been added. The second part of  
136 the EMPATHIC-30 questionnaire included the 30 items divided in five domains. The short  
137 version of the EMPATHIC-30 questionnaire was developed from the EMPATHIC initial  
138 version (15). This version was developed in eight Pediatric Intensive Care Units (PICU) in the  
139 Netherlands (15). Further statistical redundancy testing with 3354 parents resulted in the short  
140 version of the EMPATHIC-30 questionnaire (16). The EMPATHIC-30 consists of five  
141 domains: Information (5 items), Care & Treatment (8 items), Organization (5 items), Parent  
142 Participation (6 items) and Professional Attitude (6 items). The answer option scale is a 6-point  
143 Likert type (1=certainly no; 6=certainly yes) and each item has an additional "Not Applicable"  
144 option. The reliability estimates (Cronbach's  $\alpha$ ) of the domains were adequate and ranged from  
145 0.73 to 0.93. Approval to use the EMPATHIC-30 was granted by the developer (J.M. Latour)  
146 and was part of the research team.

147

## 148 **Translation and Cultural Adaptation**

149 The translation and cultural adaptation process followed the Principles of Good Practice for  
150 the Translation and Cultural Adaptation of Patient-Reported Outcomes Measures described by  
151 the task force of the International Society for Pharmacoeconomics and Outcomes Research  
152 (17). This 10-step process included:

153 Step 1: Preparation: Permission was granted by the developer to use EMPATHIC-30  
154 questionnaire. The EMPATHIC-30 was revised before translation; PICU or ICU was reworded  
155 to NICU.

156 Step 2: Forward translation: The translation was performed in Turkish language by two  
157 translators independently. With approval of the developer, the EMPATHIC-30-UK was used for  
158 the translation.

159 Step 3: Reconciliation: The translated version was reviewed on meaning and spelling of the  
160 items by PICU and research experts.

161 Step 4: Back translation: The Turkish EMPATHIC-30 was translated back to English by one  
162 translator.

163 Step 5: Back translation review: The translation was found to be sufficiently translated to the  
164 original questionnaire.

165 Step 6-Harmonization: The questionnaire was reviewed by the research team and the developer  
166 and was found to be suitable for the Turkish population.

167 Step 7: Cognitive debriefing: The Turkish EMPATHIC-30 was reviewed by nine experts in  
168 Child Health and Diseases Nursing Department, Department of Child Health and Diseases,

169 Department of Child Psychiatry, and Internal Medicine Nursing Department. The experts were  
170 asked to assess the suitability and clarity of each item. They were asked to rate each statement  
171 between 1 and 4 points (1 point: not appropriate, 2 points: slightly appropriate, 3 points:  
172 appropriate, 4 points: completely appropriate), and write their opinions and suggestions for  
173 each item.

174 Step 8: Review of cognitive debriefing results and finalization: In line with the opinions of the  
175 experts, the items were reviewed, and necessary changes were made. As a result of the  
176 evaluation of experts, all items were corrected in terms of language and expression with the  
177 suggestions and contributions of experts.

178 Step 9-Proofreading: The Turkish EMPATHIC-30 questions were reviewed. After applying  
179 the final version of the scale to 10 parents, it was decided that there were no unclear  
180 expressions.

181 Step 10-Final Report: This paper presents the final report and further validity testing.

182

### 183 **Data Collection**

184 The data of the study were collected from parents when their infants were discharged from the  
185 NICU. Parents visiting the newborn outpatient clinic two weeks after discharge received the  
186 questionnaire and the consent form. Data collection was in line with the original EMPATHIC  
187 studies where data was collected two to three weeks after discharge (14-16). The  
188 questionnaires, in paper version, were completed during the outpatient clinic visit and  
189 completion time was between 10-15 minutes.

190 We planned to use a minimum of 10% of the total sample for the test-retest (18). In order to  
191 assess the test-retest reliability of the questionnaire two weeks later, parents (n=35) who  
192 previously agreed to be contacted were asked by phone to meet at the outpatient clinic at their  
193 preferred day and time to complete the second questionnaire.

194

### 195 **Data Analysis**

196 Number and percentage (n, %) were used to define categorical variables in order to identify the  
197 characteristics of the data of 238 participants; mean and standard deviation was used to define  
198 numerical variables. Test-retest reliability analysis was performed using the correlation  
199 coefficient (r) and intraclass correlation coefficient (ICC). Confirmatory factor analysis (CFA)  
200 is tailored to unraveling the empirical structure of the interrelationship of the 30 statements.  
201 The final model was based on both theoretical and statistical plausibility. The measures applied  
202 in this study were  $\chi^2$  test of model fit, and the ratio of  $\chi^2/df$  represents a good model fit.  
203 Other tests used for the model fit were: comparative fit index (preferably CFI  $\geq 0.95$ ), Tucker-  
204 Lewis index (preferably TLI  $\geq 0.95$ ), root mean square error of approximation (preferably  
205 RMSEA  $\leq 0.08$ ), and the weighted root mean square residual (preferably WRMR  $\leq 0.90$ ) (19).  
206 Data were evaluated with the statistical software program IBM SPSS Statistics 22 and type 1  
207 error ( $\alpha$ ) was set at 0.05.

208

### 209 **RESULTS**

210 Of the 238 parents who returned the questionnaire, 98.3% were mothers with a mean age 28.27  
211 (SD 5.93). Furthermore, 48.3% were primary school graduates, 21% were employed, and  
212 44.5% had moderate income. According to pregnancy histories, 38.1% mother had their first  
213 baby, 78.1% had pregnancy planned, 95.8% had spontaneous pregnancy, 42.9% had normal  
214 birth, 42.9% had at least one child. 55.9% of the infants were male with a mean gestational age  
215 of 36.89 (SD 3.25) weeks and the mean birth weight was 2863.82 (SD 238.03) grams. Hospital  
216 length of stay was 9.36 (SD 10.17) days. During the hospital stay, 56.7% of the infants received  
217 only breast milk, 42.4% received both breast milk and formula (Table 1).

218

219 The Cronbach's alpha of the domains of the EMPATHIC-30 questionnaire ranged from 0.804  
220 to 0.922 (Table 2). The mean scores and standard deviations are presented in Table 2. The  
221 mean score, standard deviation, and total Cronbach's alpha coefficient of each item are  
222 presented in Table 3. The lowest mean score was the item 'We received understandable  
223 information about the effects of the medication' (mean 4,01, SD 1,40). The highest rated item  
224 was "The team respected the privacy of our child's and of us" (mean 4,81, SD 0,89).

225

226 The Pearson correlation coefficient (r) with the total score of each domain ranged from 0.806  
227 to 0.900 (Table 4). One month after the test, 35 parents completed the retest questionnaire and  
228 the Pearson correlation coefficient between the two evaluations was  $r=0.988$ ; Intraclass  
229 correlation coefficient was  $ICC=0.998$ . Confirmatory factor analysis for the construct validity  
230 confirmed a moderate model fit with the preferred values of Comparative Fit Index and the  
231 Tucker-Lewis Index slightly below the preferred  $\geq 0.95$ . The Root Mean Square Error of  
232 Approximation (preferably  $<0.08$ ) was 0.107 while the Standardized Root Mean Square  
233 Residual RMSEA was adequate performed with 0.081, preferably  $<0.90$  (Table 5).

234

## 235 **DISCUSSION**

236 Family-centered care practices not only increase parental satisfaction but also improve the  
237 quality of care (20). A search of the literature revealed that there are no questionnaires available  
238 to measure parent satisfaction among Turkey parents in the NICU. The EMPATHIC-30  
239 questionnaire is widely used in many countries to measure family satisfaction (21-23). Our  
240 findings are in line with previous investigations of the adaptation of EMPATHIC-30 in other  
241 languages. It seems that the EMPATHIC-30 instrument can be applied to measure parental  
242 satisfaction and can be adapted in different cultural and linguistic backgrounds.

243

244 As a result of the analysis, the Cronbach's alpha values in our study of the five domains  
245 (between 0.804-0.922) showed that the reliability levels of the questionnaire are high. In the  
246 original study of the shortened EMPATHIC-30 study, the Cronbach's alpha values ranged  
247 between 0.73 and 0.81 (16). Other studies translating and validating the EMPATHIC-30 in  
248 Italy, Spain and Brazil reported similar internal consistency figure compared to the original  
249 study (16, 22-24). Surprisingly, a study in South Africa reported much lower Cronbach's alpha  
250 on domain levels; between 0.25-0.59 (21). The authors addressed these differences because of  
251 a limitation of their small study sample of 100 parents influencing the scores (21).

252

253 The means of all items in the EMPATHIC-30 in our study were all below 5. This is in contrast  
254 with all other similar studies (16, 21-25). The study in South Africa is the only study reporting  
255 that all items had a mean score above 5 (21). This might indicate that parent satisfaction is  
256 culturally dependent. However, another explanation could be the family-centered care practices  
257 that may vary across countries. In our study and setting it can be argued that family-centered  
258 care is not yet fully implemented and therefore parents might have rated the satisfaction items  
259 lower as reported in other countries. Further studies are needed to explore the relationship  
260 between different family-centered care practices and parent satisfaction outcomes (26,27).

261

262 In our NICU, parents whose infants are hospitalizing generally take the role of visitors while  
263 their babies are cared for and treated by nurses and doctors. However, when parents are  
264 accepted as members of the healthcare team and value their own knowledge and skills, they  
265 feel more adequate and safer in caring for their infants (28,29). In this case, it becomes easier  
266 to deal with changes in the family role. Although our study is important in terms of revealing  
267 that the satisfaction of parents in this regard is not at the desired level, we think that this

268 questionnaire, which has been adapted in Turkish will increase the interest in the subject and  
269 contribute to improving family-centered care practices in Turkish NICUs.

270

271 The highest rated domain of the Turkish EMPATHIC-30 questionnaire was the domain of  
272 'Professional Attitude'. This was comparable with the EMPATHIC-30 AUS study in Australia,  
273 while other similar studies from Italy, Brazil and Greek-Cyprus demonstrated the highest mean  
274 values in the domain "Care and Treatment" (12,23,24,25). Variables such as functioning of the  
275 international health system, the NICU conditions and the demographic characteristics of  
276 parents and their expectations might affect their perceptions of health. The high level of trust  
277 in nurses and doctors in our study increased the value of 'Professional Attitude'. However, and  
278 overall, our findings indicate that a revisit of our family-centered care practices is needed.  
279 Consequently, we have extended the visiting policies, provided visuals and information about  
280 family-centered care for parents on boards in the NICU and waiting rooms, further brochures  
281 for parents about family-centered care practices such as their involvement in care are in  
282 progress and in-service family-centered care training for NICU staff will commence in the near  
283 future.

284

285 Our study warrants some limitations. First, the number of fathers participating in the study was  
286 low. This might be because in our culture, fathers are often working during the daytime and  
287 have limited time to visit the NICU while also caring for siblings and other socio-economic  
288 issues. Another limitation is the translation process. Although agreed by the developer, we did  
289 not use the original Dutch version but instead the translated English version which has been  
290 used in the UK. We acknowledge that our study included only parents from a NICU in one  
291 hospital. Further multi-center testing would be needed and could enhance the acceptability of  
292 the validated Turkish version of the EMPATHIC-30 instrument. Finally, most parents who  
293 participated in the study were those whose infants were admitted to the level I and II units.  
294 Further research is needed to assess parent satisfaction across all levels of care in a Neonatal  
295 department.

296

## 297 **CONCLUSION**

298 Based on the results of our study, the Turkish version of EMPATHIC-30 is a reliable and valid  
299 instrument that can be used to measure satisfaction of the parents in NICU settings. The  
300 EMPATHIC-30 Turkish can be considered as a benchmark tool to learn from parental reported  
301 outcomes of other NICUs. Finally, the instrument can be used among parents from Turkish  
302 origin in other countries.

303 **REFERENCES**

- 304 1. Yayan EH, Özdemir M, Düken ME, Suna Dağ Y. Determination of stress levels of parents  
305 in newborn intensive care unit of baby. *GÜSBĐ*. (2019) 8:82-89.
- 306 2. Çirlak A, Erdemir F. Comfort Level of Parents Who Have Newborns in Neonatal Intensive  
307 Care Units. *Anadolu Hemşirelik ve Sağlık Bilimleri Dergisi*. (2013) 16:73-81.
- 308 3. Boztepe H, Çavuşoğlu H. Examination of a Family Centered Care Practice at the Children's  
309 Units of a University Hospital. *Hacettepe University Faculty of Health Sciences Nursing*  
310 *Journal*. (2009) 16:11-24.
- 311 4. Zhang R, Huang RW, Gao, XR, Peng XM, Zhu LH, Rangasamy R, Latour JM. Involvement  
312 of Parents in the Care of Preterm Infants: A Pilot Study Evaluating a Family-Centered Care  
313 Intervention in a Chinese Neonatal ICU. *Pediatr Crit Care Med*. (2018) 19:741-747. doi:  
314 10.1097/PCC.0000000000001586
- 315 5. Lv B, Xi-ronga G, Jing, S, Tao-tao L, Zhen-ye L, Li-hui Z, Latour JM. Family-Centered  
316 Care Improves Clinical Outcomes of Very-Low-Birth-Weight Infants: A Quasi-Experimental  
317 Study. *Front Pediatr*. (2019) 7:138. doi: 10.3389/fped.2019.00138.
- 318 6. Zurca AD, Corriveau CO. Family communication in the PICU: Less than ideal no matter  
319 how you say it. *Crit Care Med*. (2014) 42:1569-1570.  
320 <https://doi.org/10.1097/ccm.0000000000000255>
- 321 7. Zurca AD, Fisher KR, Flor RJ, et al. Communication with limited English-proficient families  
322 in the PICU. *Hosp Pediatr*. (2017) 7:9-15. <https://doi.org/10.1542/hpeds.2016-0071>
- 323 8. Ding X, Zhu LH, Zhang R, Wang L, Wang TT, Latour JM. Effects of family-centered care  
324 interventions on preterm infants and parents in neonatal intensive care units: a systematic  
325 review and meta-analysis of randomized controlled trials. *Austral Crit Care*. (2019) 32:63-75.  
326 doi: 10.1016/j.aucc.2018.10.007.
- 327 9. Berman L, Raval MV, Ottosen M, Mackow AK, Cho M, Goldin AB. Parent Perspectives on  
328 Readiness for Discharge Home after Neonatal Intensive Care Unit Admission. *J*  
329 *Pediatr*. (2019) 205:98-104. doi: 10.1016/j.jpeds.2018.08.086
- 330 10. Russell G, Sawyer A, Rabe H, Abbott J, Gyte G, Duley L, Ayers S. Parents' views on care  
331 of their very premature babies in neonatal intensive care units: A qualitative study. *BMC*  
332 *Pediatr*. (2014) 14:230-240. doi: 10.1186/1471-2431-14-230.
- 333 11. Balcı S, Yıldırım Balkan Z. Yenidoğan yoğun bakım ünitesinde aile merkezli bakım.  
334 *Pediatric Hemşireliğinde Aile Merkezli Bakım*. (2019) 18-23.
- 335 12. Papamichael E, Ioannou M, Talias MA. EMPATHIC-N in a Greek-Cypriot sample:  
336 confirming its factorial structure. *BMC Health Serv Res*. (2018); 18:968. doi: 10.1186/s12913-  
337 018-3793-3.
- 338 13. Weissenstein A, Straeter A, Villalon G, Luchter E, Bittman S. Parent satisfaction with a  
339 pediatric practice in Germany: a questionnaire-based study. *Ital J Pediatr*. (2011) 37:31-37.  
340 doi: 10.1186/1824-7288-37-31.
- 341 14. Latour JM, Duivenvoorden HJ, Hazelzet JA, van Goudoever JB: Development and  
342 validation of a neonatal intensive care parent satisfaction instrument. *Pediatr Crit Care Med*.  
343 (2012) 13:554-559. doi: 10.1097/PCC.0b013e318238b80a.
- 344 15. Latour JM, van Goudoever JB, Duivenvoorden HJ, Albers MJJJ, van Dam NAM, Dullaart  
345 E, et al. Construction and psychometric testing of the EMPATHIC questionnaire measuring  
346 parent satisfaction in the pediatric intensive care unit. *Intensive Care Med*. (2011) 37:310-318  
347 doi: 10.1007/s00134-010-2042-y.
- 348 16. Latour JM, Duivenvoorden HJ, Tibboel D, Hazelzet JA, and the EMPATHIC Study Group.  
349 The shortened EMpowerment of PArEnts in THE Intensive Care 30 questionnaire adequately  
350 measured parent satisfaction in pediatric intensive care units. *J Clin Epidemiol*. (2013) 66:  
351 1045-1050. doi: 10.1016/j.jclinepi.2013.02.010.

- 352 17. Wild D, Grove A, Martin M, Eremenco S, McElroy S, Verjee-Lorenz, et al. ISPOR Task  
353 Force for Translation and Cultural Adaptation. Principles of good practice for the translation  
354 and cultural adaptation process for patient-reported outcomes (PRO) measures: report of the  
355 ISPOR Task Force for translation and cultural adaptation. *Value Health*. (2005) 8:94-104.
- 356 18. Arlı M, Nazik H. Bilimsel araştırmaya giriş. Ankara: Gazi Kitabevi. (2001) :77
- 357 19. Schreiber JB. Core reporting practices in structural equation modeling. *Res Social Adm*  
358 *Pharm*. (2008) 4:83–97. doi: 10.1016/j.sapharm.2007.04.003.
- 359 20. Meert KL, Clark J, Eggly S. Family-centered care in the pediatric intensive care unit.  
360 *Pediatr Clin North Am*. (2013) 60:761-772. doi: 10.1016/j.pcl.2013.02.011.
- 361 21. Mol C, Argent AC, Morrow BM. Parental satisfaction with the quality of care in a South  
362 African paediatric intensive care unit. *S Afr J Crit Care*. (2018) 34:50-56. doi:  
363 10.7196/SAJCC.201.v34i2.366.
- 364 22. Orive FJP, Lozano JB, Zuñiga AL, Fernández YML, Argaluz JE, Latour JM. Spanish  
365 translation and validation of the EMPATHIC-30 questionnaire to measure parental satisfaction  
366 in intensive care units. *An Pediatr (Barc)*. (2018) 89:50-57. doi:  
367 10.1016/j.anpedi.2017.08.004.
- 368 23. Dall'Oglio I, Fiori M, Tiozzo E, Mascolo R, Portanova A, Gawronski O, Ragni A, et al.  
369 Neonatal intensive care parent satisfaction: a multicenter study translating and validating the  
370 Italian EMPATHIC-N questionnaire. *Ital J Pediatr*. (2018) 44:5 doi: 10.1186/s13052-017-  
371 0439-8.
- 372 24. Gomez DBCA, Vidal SA, Lima LCS. Brazilian adaptation and validation of the  
373 Empowerment of Parents in the Intensive Care-Neonatology (EMPATHIC-N) questionnaire.  
374 *J Pediatr (Rio J)*. (2017) 93:156-164. doi: 10.1016/j.jped.2016.06.007.
- 375 25. Gill FJ, Wilson S, Aydon L, Leslie GD, Latour JM. Empowering parents of Australian  
376 infants and children in hospital: Translation, cultural adaptation, and validation of the  
377 Empowerment of PARENTS in The Intensive Care-30-AUS questionnaire. *Pediatr Crit Care*  
378 *Med*. (2017) 18:e506-e513. doi: 10.1097/PCC.0000000000001309.
- 379 26. Dall'Oglio I, Mascolo R, Tiozzo E, Portanova A, Fiori M, Gawronski O, Dotta A, Piga S,  
380 Offidani C, Alvaro R, Rocco G, Latour JM, FCC Italian NICUs Study Group. The current  
381 practice of family-centred care in Italian neonatal intensive care units: A multi-centre  
382 descriptive study. *Intensive Crit Care Nurs*. (2019) 50:36-43. doi:  
383 10.1016/j.iccn.2018.07.005.
- 384 27. Lake ET, Smith JG, Staiger DO, Hatfield LA, Cramer E, Kalisch BJ, Rogowski JA.  
385 Parent satisfaction with care and treatment relates to missed nursing care in Neonatal  
386 Intensive Care Units. *Front Pediatr*. (2020) 8:74. doi: 10.3389/fped.2020.00074.
- 387 28. Segers E, Ockhuijsen H, Baarendse P, van Eerden I, van den Hoogen A. The impact of  
388 family centred care interventions in a neonatal or paediatric intensive care unit on parents'  
389 satisfaction and length of stay: A systematic review. *Intensive Crit Care Nurs*. (2019) 50:63-  
390 70. doi: 10.1016/j.iccn.2018.08.008.
- 391 29. Kamphorst K, Brouwer AJ, Poslowsky IE, Ketelaar M, Ockhuisen H, van den Hoogen A.  
392 Parental presence and activities in a Dutch Neonatal Intensive Care Unit: An observational  
393 study. *J Perinat Neonatal Nurs*. (2018) 32:E3-E10. doi: 10.1097/JPN.0000000000000354.

394 **Table 1.** Descriptive Characteristics of Parents and Infants

<b>Characteristics</b>	<b>N=238</b>	<b>%</b>
<b>Participant</b>		
Mother	234	98.3
Father	4	1.7
<b>Education</b>		
Primary education	115	48.3
High school	79	33.2
License	49	16.8
Postgraduate	4	1.7
<b>Working Condition</b>		
Yes	50	21
No	188	79
<b>Income Status (family's own statement)</b>		
Good	55	23
Middle	106	44.5
Bad	77	32.5
<b>Gender of Infant</b>		
Girl	105	44.1
Male	133	55.9
<b>Number of Children</b>		
1	102	42.8
2	73	30.7
≥ 3	63	26.5
<b>Person Taken Information Related to Infant</b>		
Doctor	205	86.1
Nurse	24	10.1
Doctor and Nurse	5	2.1
Medical secretary	4	1.7
<b>Total Pregnancy Number of Mother</b>		
1	92	38.7
2	64	26.9
3	51	21.4
4	13	5.4
≥ 5	18	7.6
<b>Birth Type</b>		
Normal	102	42.9
Cesarean	136	57.1
<b>Planned Pregnancy</b>		
Yes	174	73.1
No	64	26.9
<b>Infant Feeding Type</b>		
Breast Milk Only	135	56.8
Breast Milk and Formula	101	42.4
Only Formula	2	0.8
Age Parents (mean, SD)	28.27 (5.93)	min-max: 15-48
Infant Gestational Age in weeks (mean, SD)	36.89 (3.25)	min-max: 26-41
Infant's birth weight (mean, SD)	2863.82 (238.03)	min-max: 630-5800
Length of stay NICU in days (mean, SD)	9.36 (10.17)	min-max: 2-78)

395 SD=Standard Deviation

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399 **Table 2.** Mean (SD) and Cronbach's  $\alpha$  of the domains of the Turkish EMPATHIC-30

Domains	Mean	Standard Deviation	Min	Max	Cronbach Alpha
1. Information	21.87	4.54	8	30	0.831
2. Care & Treatment	35.98	6.36	20	48	0.848
3. Organization	22.54	4.22	9	30	0.804
4. Parent Participation	27.69	4.71	15	36	0.869
5. Professional Attitude	27.85	5.10	9	36	0.922

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409 **Table 3.** Descriptive analysis EMPATHIC-30 items

<b>EMPATHIC-30 items</b>	<b>Mean</b>	<b>Standard Deviation</b>	<b>Cronbach's Alpha if Item Deleted</b>
1. We had daily talks about our child's care and treatment with the doctors	4.59	1.04	0.953
2. We had daily talks about our child's care and treatment with the nurses	4.44	1.14	0.953
3. The doctor clearly informed us about the consequences of our child's treatment	4.56	1.08	0.952
4. We received clear information about the examinations and tests	4.27	1.19	0.952
5. We received understandable information about the effects of the medication	4.01	1.40	0.954
6. The doctors and nurses worked closely together	4.74	0.91	0.952
7. We were well prepared for our child's discharge by the doctors	4.22	1.48	0.955
8. We were well prepared for our child's discharge by the nurses	4.31	1.40	0.955
9. The team was alert to the prevention and treatment of pain in our child	4.75	0.80	0.952
10. Our child's comfort was taken into account by the doctors	4.80	0.83	0.952
11. Our child's comfort was taken into account by the nurses	4.76	0.87	0.953
12. Every day we knew who was responsible for our child, regarding the doctors	4.12	1.32	0.952
13. Every day we knew who was responsible for our child, regarding the nurses	4.27	1.28	0.952
14. The team worked efficiently	4.64	1.01	0.952
15. The IC-unit could easily be reached by telephone	4.31	1.28	0.955
16. There was enough space around our child's bed	4.45	1.21	0.953
17. The IC-unit was clean	4.69	0.95	0.952
18. Noise in the IC-unit was muffled as good as possible	4.45	1.15	0.952
19. During our stay the staff regularly asked for our experiences	4.41	1.13	0.952
20. We were actively involved in decision-making on care and treatment of our child	4.47	1.09	0.951
21. We were encouraged to stay close to our child	4.72	0.93	0.952
22. We had confidence in the doctors	4.87	0.77	0.952
23. We had confidence in the nurses	4.87	0.79	0.952
24. Even during intensive procedures we could always stay close to our child	4.36	1.25	0.953
25. We received sympathy from the doctors	4.48	1.14	0.952
26. We received sympathy from the nurses	4.49	1.12	0.952
27. The team worked hygienically	4.72	0.92	0.952
28. The team respected the privacy of our child's and of us	4.81	0.89	0.952
29. The team showed respect for our child and for us	4.80	0.85	0.952
30. At admission we felt welcome	4.55	1.05	0.952

**Table 4.** Correlations of Domains 412  
and total EMPATHIC-30

<b>Domains</b>	<b>Total</b>
1.Information	0.806 <sup>415</sup>
2.Care & Treatment	0.900
3.Organization	0.847 <sup>417</sup>
4.Parent Participation	0.874
5.Professional Attitude	0.861

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**Table 5.** Compliance Index Values of Measurement Model

<b>EMPATHIC-30 items</b>	<b>Compliance Index Values</b>	
<b>CFI</b>	0.792	423
<b>TLI</b>	0.770	
<b>RMSEA</b>	0.107	425
<b>SRMR</b>	0.081	

427 CFI=Comparative Fit Index; TLI=Tucker–Lewis Index; SRMR=Standardized Root Mean  
428 Square Residual; RMSEA=Root Mean Square Error of Approximation.