Does Social Self-Efficacy moderate the Relationship between Social Support and Anxiety among young Family Members of former ICU Patients? A Survey Study

Bachelor Thesis

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Lena Fitzian

s2117371

1st Supervisor: Jorinde E. Spook, PhD

2nd Supervisor: Britt E. Bente, MSc

B.Sc. Psychology

Faculty of Behavioural, Management and Social Sciences (BMS)

University of Twente, Enschede, Netherlands

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Abstract

Background: The Intensive Care Unit is one of the places where family members suffer the most. Many of them develop symptoms of the Post Intensive Care Syndrome – Family (PICS-F) lasting after the release from the ICU. Anxiety is one of the most prevalent symptoms of PICS-F and one of the main health related threats to young adults. Therefore, this study focused on anxiety in people between the ages of 18 and 29 filling the research gap on this target group and extending the current insights to 18 months following the release of the relative from the ICU. Furthermore, social support has been named one of the main coping resources with social self-efficacy influencing someone's perceived social support. It was expected that symptoms of anxiety decrease with time progressing. Further, social self-efficacy was expected to moderate the association between social support and anxiety.

Method: A convenience sample of 42 participants was included in the analysis with 69% being female and the majority from Germany (*M*age = 22.76). A survey was administered using the anxiety subscale of the Hospital Anxiety and Depression Scale (α=.71), the Multidimensional Scale for Perceived Social Support (α=.90), and the social subscale of the Self-Efficacy Scale (α=.59). Afterwards, the association was tested using a linear regression model whereas the moderation analysis was assessed using a multiple regression model.

Results: No significant association between time and anxiety could be noted (*p*=.44). Additionally, social self-efficacy was not found to be a significant moderator of the association between social support and anxiety (*p*=.51).

Conclusion: The study helped contribute to the little body of information available on the topic for this specific target group. It indicated that young adults may differ in their utilization of social support and could benefit more from receiving additional support that is not part of their usual social surrounding. Therefore, suggestions for future studies, such as focusing on specific personalities and different types of social support, may help develop more tailored interventions to prevent PICS-F using social support.

Keywords: Post Intensive Care Syndrome – Family, Anxiety, Social Support, Social Self-efficacy, Social Cognitive Theory, young Adults

Introduction

Background

Due to the COVID-19 pandemic starting in March of 2020, a stark increase in the number of intensive care unit (ICU) patients has been noted throughout the Netherlands. Even though the numbers are generally decreasing again, consequences might linger on for longer (Stewart, 2020). Oftentimes, the ICU environment comes with increased stress levels, not only having an impact on the patients but also on the family members (Davidson, Jones, & Bienvenu, 2012). Harvey (1998) stated that the ICU is one of the places where the family members of patients suffer the most. Two thirds of all family members experience symptoms of posttraumatic stress, depression, or anxiety (Harlan et al., 2018). However, the impact does not vanish when the patient is released from the hospital or even dies. Symptoms can linger on or arise afterwards. About half of the family members noted symptoms for months after the stay, known as the *post-intensive care syndrome – family* (PICS-F), having a great influence on their daily lives (Harlan et al., 2018).

As Pochard et al. (2005) have found symptoms of anxiety in around 75% of family members of ICU patients, decreasing their quality of life (Fridriksdottir, et al., 2010), it will be the focal point of this study. Many coping variables associated with anxiety have already been researched, such as social support (Davidson et al., 2012). Based on a finding by Carmeli, Peng, Schaubroeck, & Amir (2020), the already established association of social support and anxiety will be extended by including social self-efficacy. Therefore, this study fills the research gap and contributes to the understanding of the PICS-F.

PICS-F and Anxiety

Davidson et al. (2012) describe the PICS-F as a cluster of psychological outcomes due to exposure to critical care. This cluster consists of symptoms of anxiety, acute stress disorder, posttraumatic stress, depression, and complicated grief. Symptoms can remain for up to four years after the discharge of the patient from the hospital and affect the ability to execute care-giving functions that might be necessary. Additionally, many of the disorders are comorbid. For example, severe PTSD is associated with an increased prevalence of anxiety as well as depression (Pochard et al., 2005). Even though the previous findings were based on family members of patients at the day of the release from the hospital, previous studies have already shown that symptoms can remain.

An anxiety disorder is a psychological disorder characterized by an excessive or aroused state with feelings of apprehension, uncertainty, and fear (Davey, 2014). When symptoms of anxiety interfere with living a normal life, it becomes problematic (Roman, 2014). Davidson et al. (2012) showed in their review of several previous studies that clinically relevant anxiety is common in family members shortly after the release of a relative who has been in the ICU. The median score among these relatives was 40% (within a range of 21% and 56%). However, Davidson et al. (2012) also note that these symptoms seem to decrease over time. Most family members report more severe symptoms within the first three months after the release from the ICU. Afterwards, the symptoms seem to decrease (Davidson et al., 2012). Nevertheless, these decreased symptoms can affect the family members many years following the release from the ICU. For example, it has been shown that, four years after the release, relatives of former ICU patients still worry more about health and bodily functions compared to a control group (Rodríguez, San Gregorio, & Rodríguez, 2005).

There seem to be several gaps in research. First, not much data on the severity of symptoms of anxiety past twelve months following the release can be found. Most studies focus only on a time span of up to six or twelve months. However, it has already been shown that symptoms can last and affect family members for longer. Second, symptoms of young adult relatives have not been assessed in depth. Symptoms of anxiety have been associated with younger age in the first three months following the release, but no association was found between four and twelve months (Anderson, Arnold, Angus, & Bryce, 2009). While many previous studies have focused on the parents, spouses, or general relatives of patients (Davidson et al., 2012), no study has yet focused on younger adults past twelve months. However, insights on this group are of need. Elflein (2020) note that, of all people in the US reporting symptoms of anxiety, 18- to 29-year-olds make up the largest proportion of all age groups with 19.5%. Therefore, this study is going to focus on anxiety symptoms of young adults up to 18 months following the release of their relative from the ICU.

Predictors of Anxiety

Symptoms of anxiety can have several predictors. Many risk factors are the same as the ones for the other PICS-F symptoms. These include factors such as the relatives' gender (being female positively predicts PICS-F development), age of both relative and patient, educational level, and relationship to the patient (Davidson et al., 2012). Additionally, pre-existing symptoms of

anxiety and depression or a family history of a mental illness are risk factors (Hettema, Prescott, Myers, Neale, & Kendler, 2005). Furthermore, the preferred decision-making role has an influence on the prevalence of anxiety (Anderson et al., 2009; Davidson et al., 2012). Next, symptoms are more common when felt that information on the patient's condition is incomplete (Azoulay, 2005, as cited in Davidson et al., 2012). For example, people were less likely to show symptoms if they felt that the staff delivered all important information (Anderson et al., 2009). Finally, many studies have mentioned perceived social support as an important influence in the development of anxiety.

Perceived Social Support as a Coping Resource

Social support can be a coping resource people use when confronted with stressors. It is defined by Cobb (1976, p. 300) as "information leading the subject to believe that he is cared for and loved, esteemed, and a member of a network of mutual obligations" (as cited in Carmeli et al., 2020). It has been shown that relationships can give people social support and contribute to their mental and physical health and help reduce the likelihood of developing depression and anxiety after negative events (Thoits, 1995). Further, Anxiety levels of family members of former ICU patients have been shown to negatively correlate with perceived social support (Davidson et al., 2012).

Family members of former ICU patients perceive different amounts of social support. Those who experienced more social support had a lower-state anxiety (Davidson et al., 2012). This goes along with a finding by Harlan et al. (2018) specifying six main coping strategies family members used, one of which is seeking support. Relatives seem to have the need to receive the help or emotional support of others. This can be in the form of spiritual support, help from medical personnel but also the comfort of a friend or just general contact with others. Additionally, Carmeli et al. (2020) note that a large body of research can be found emphasizing the role of perceived social support in mitigating potential outcomes of stressors such as symptoms of anxiety. They conducted a study among older students which showed that social support influences vitality and mental health. However, they also note an interaction of social self-efficacy and social support. Pursuing this finding, the social cognitive theory by Bandura can be employed to explain the interaction of perceived social support and social self-efficacy.

Social Self-efficacy through the Social Cognitive Theory

Following Bandura's social cognitive theory of 1977, the interaction of social support and self-efficacy can explain symptoms of anxiety. The social cognitive theory explains that behaviour is learned through someone's social surrounding, cognition, and previous experiences. (Bandura, 1977, as cited in Kassin, Fein, & Markus, 2017). It emphasizes the role of cognition in someone's ability to assess a situation, perform a behaviour and construct the reality including concepts like social self-efficacy (Bandura, 2002, as cited in Riaz Ahmad, Yasien, & Ahmad, 2014). Self-efficacy is a person's belief that they have the capability to conduct a certain task or action (Bandura, 1995). Therefore, social self-efficacy can be defined as the "confidence of the individual to participate and engage in social interactions" (Carmeli et al., 2020, p. 352). Someone's self-efficacy can strongly affect their overall functioning. It is needed to develop new subskills and adapt to a changing environment or new situations that may be stressful, or unpredictable, such as the admission of a relative to the ICU (Bandura, 2002, as cited in Riaz et al., 2014).

Someone with high social self-efficacy is more likely to display behaviour that would lead to more perceived social support. First, someone with high social self-efficacy can approach others leading to a greater support system that can help them deal with their environment. For example, Riaz Ahmad et al. (2014) state that people with a higher perceived social self-efficacy are more likely to have a strong support system. Second, people with higher social self-efficacy are more likely to approach their social surrounding when they need support, therefore perceiving more support. Carmeli et al. (2020) have shown that high social self-efficacy is positively correlated to confidence asking for social support (Carmeli et al., 2020). Thus, the theory can explain how someone's social self-efficacy and social behaviour interact in dealing with environmental factors.

Based on the social cognitive theory, it can be expected that social self-efficacy has a role in the association of perceived social support and anxiety. Someone with high social self-efficacy can find and perceive the support they need to deal with the admission of a relative to the ICU. Therefore, symptoms of anxiety may be reduced. For example, Carmeli et al. (2020) have shown that the association of perceived social support and vitality is moderated by social self-efficacy, especially for people scoring low on social self-efficacy. They have more trouble utilizing their social surrounding and therefore benefit more from receiving additional social support, i.e., the relationship between social support and vitality is stronger (Carmeli et al., 2020). As an association between social support and anxiety has already been established, it can be expected that social self-

efficacy moderates this association. People scoring high on social self-efficacy are more likely to utilize their perceived social support. This increases the negative association of perceived social support and symptoms of anxiety.

Current Study

Following the existing body of research, the aim of this study is to extent the knowledge on symptoms of anxiety in young adult relatives of former ICU patients to 18 months and contribute to the literature on these relatives by assessing whether social self-efficacy moderates the association of perceived social support and anxiety (see Figure 1). The outcomes can contribute to the development of new interventions preventing symptoms of the PICS-F.

The following hypotheses are formulated to meet the aim of this study:

H1: *Time since patient discharge from the ICU is negatively associated with symptoms of anxiety within young adult relatives (18-to-29-year-olds) of ICU patients*

H2*: Social self-efficacy moderates the relationship between perceived social support and anxiety among young adults (18-to-29-year-olds) who had a relative admitted to the ICU in the past 18 months*

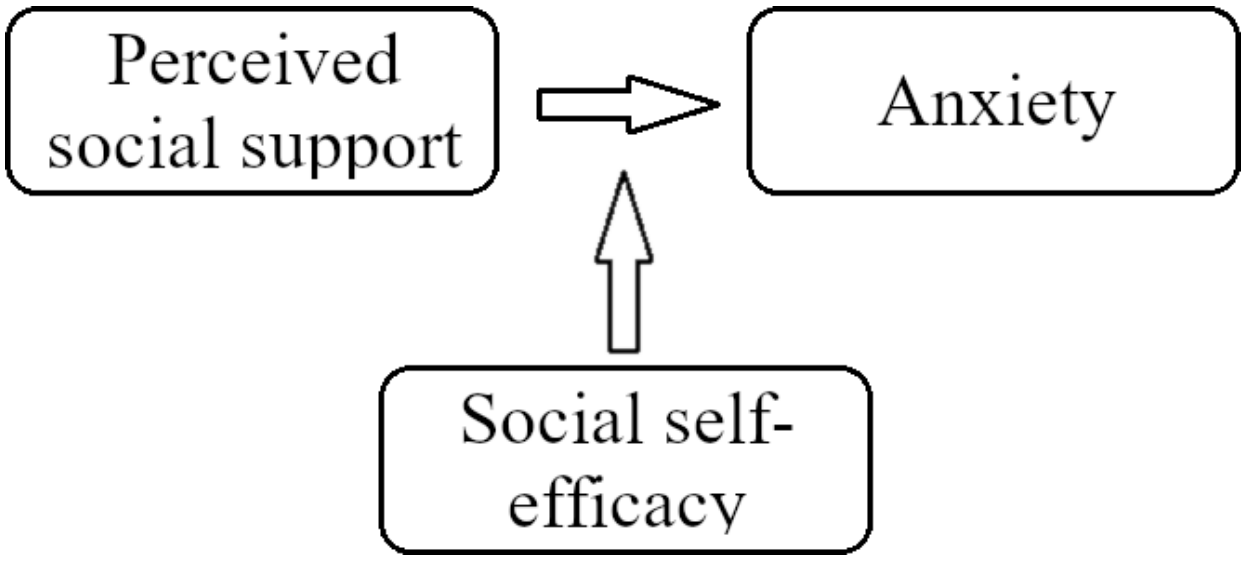

Figure 1. *Visualization of the proposed model.*

Methods

This study was part of a larger cooperation of six bachelor students gathering data together for the aim of writing their bachelor thesis. While all students have the same overall topic of mental or physical health after the stay of a relative in the ICU, the different aims are examined independently. The variables in the full survey study include symptoms of anxiety and depression, the quality of life, stress, sleep disturbances, eating patterns, social support, flourishing, social self-efficacy and coping strategies. For this study, the focus is only on symptoms of anxiety, social support, and social self-efficacy.

Design

A survey design was used to conduct a between-subjects, cross-sectional study to meet the aim of assessing whether social self-efficacy moderates the relationship between social support and anxiety. Before data collection began, the questionnaire was approved by the ethics committee of the BMS faculty at the University of Twente (approval number: 210239). The data collection took place over the course of one month starting in April 2021. The final dataset was downloaded on the 18th of May 2021.

Participants

To maximize the number of participants, people were recruited using convenience sampling with the advantage of having a possible snowballing effect. The demographics of the participants are listed in Table 1. In total, 42 participants filled out the relevant questionnaires meeting the inclusion criteria of having had a relative in the ICU within the last 18 months, being within the age group and finishing all necessary questionnaires. Of the final participants, the majority was female and from Germany (*M*age = 22.76, *SD* = 2.46). Furthermore, the majority indicated that their relative in the ICU was their grandparent.

Table 1

Sample Characteristics (n= 42)

Characteristics	*N* (%)	*M*	*SD*	Min	Max
Total sample	42 (100)				
Gender					
Female	29				
Male	13				
non-binary/ third gender	1				
Prefer not to say	2				
Nationality					
Dutch	2 (4.8)				
German	37 (88.1)				
Other	3 (7.1)				
Age		22.76	2.46	18	29
Time since the release (in months)		6.64	4.58	0	17
The relative is the participant's					
Child	1 (2.4)				
Parent	10 (23.8)				
Grandparent	18 (42.9)				
Sibling	2 (4.8)				
Aunt/ Uncle	6 (14.3)				
Cousin	3 (7.1)				
Other	2 (4.8)				
Length of the ICU stay (in days)					
<2	4 (9.5)				

2-7	11 (26.2)				
8-14	15 (35.7)				
15-31	8 (19.0)				
>31	4 (9.5)				
Number of stays in the ICU		1.48	1.43	1.0	10.0
Need of receiving care					
Yes, provided by family	13 (31.0)				
Yes, provided by a formal caregiver	2 (4.8)				
No, the relative has passed	16 (38.1)				
No	11 (26.2)				

Materials

The survey was built using SAP's Qualtrics. It included several already established and tested questionnaires. These include the Perceived Stress Scale (PSS), the Hospital Anxiety and Depression Scale (HADS), the Mental Health Continuum (MHC), the Multidimensional Scale of Perceived Social Support (MSPSS), questions comprising the social support received by members of the hospital staff, the SF-8, the Self-efficacy Scale (SES), the Dutch Eating Behaviour Questionnaire, the Holland Sleep Disorder Questionnaire, the Coping Inventory, and the International Physical Activity Questionnaire. For the purpose of this study only the Hospital Anxiety and Depression Scale, the Multidimensional Scale for Perceived Social Support and the Social Self-efficacy scale are relevant. As the target group consists of 18-to-29-year-olds, students could be approached using the cloud-based Participant Management Software Sona-System as well as SurveyCircle, a website where researchers can share questionnaires among each other.

Measures

First, demographic data was gathered relating to the participants' gender, age, nationality, the time since the release of their relative from the ICU, the type of relationship, how long and how

often the relative stayed in the ICU and whether they are still in need of receiving care (for the form see Appendix A).

The Hospital Anxiety and Depression Scale (HADS). Second, the hospital anxiety and depression scale (HADS) by Zigmond and Snaith (1983) was used to assess the state of anxiety of family members who previously had a relative in the ICU. The questionnaire consists of 14 items, seven items relating to depression (α=.83) and seven relating to anxiety (α=.84), scored on 4-point Likert scales (0 = *not at all* to 3 = *most of the time*) (Dagnan, Chadwick, & Trower, 2000, as cited in Bjelland, Dahl, Haug, & Neckelmann, 2002). Both subscales are assessed separately. Therefore, this study can make use of only the anxiety subscale. An example item is "I get sudden feelings of panic". Bjelland et al. (2002) reviewed several studies concluding a good to very good validity. This is supported by factor analyses indicating two underlying factors. Additionally, the Cronbach's alpha was at least .60 in all studies, showing very good internal consistency in most cases (Tavakol and Dennick, 2011). The score of a participant was assessed by summing up all outcome variables on the scale. This score can be categorized as normal (between 0 and 7), as borderline abnormal (between 8 and 10) or as an abnormal case (between 11 and 21).

The Multidimensional Scale of Perceived Social Support (MSPSS). Third, the multidimensional scale of perceived social support was used (MSPSS; Zimet, Dahlem, Zimet, & Farley (1988)). The MSPSS is a three-factor model consisting of 12 items rated on a 7-point Likert scale (1 = *very strongly disagree* to 7 = *very strongly agree*). Each factor is scored on four items respectively that measure the perceived social support provided by family (α=.91), friends (α=.89) and a significant other (α=.91) (Canty-Mitchell and Zimet, 2000). Example items for each subscale are "my family really tries to help me", "I can talk about my problems with my friends" and "there is a special person who is around when I am in need". The sources providing social support used in the questionnaire are designed to allow the participants interpretations that are most relevant to them. For example, a "significant other" can be interpreted as a romantic relationship but can also be a teacher, a priest or any other person that is important to the participant (Zimet et al., 1988). Overall, the scale showed a coefficient α of .93. The factor structure, reliability and validity have been demonstrated several times across many populations and age ranges including university students which are approximately the same age as the target group which are also included in this study. Additionally, the questionnaire has been shown to have an excellent internal validity across

different subgroups (Canty-Mitchell and Zimet, 2000). Thus, it represents a great fit for this study. The sum of all items represents the final score of an individual.

The Self-efficacy Scale (SES). Lastly, the self-efficacy scale (SES) by Sherer et al. (1982) was used. However, as it consists of two subscales, general self-efficacy (α=.86) and social self-efficacy (α=.71), only the latter is assessed in this study. It has been later adapted to consist of six items rated on a 5-point Likert-type scale (1 = *strongly disagree* to 5 = *strongly agree*) (Sherer and Adams, 1983). Three of the six items are negatively formulated and must be recoded. An example item for a positively framed item is "when I am trying to make friends with someone who seems uninterested at first, I do not give up easily". An example item for a negatively frame items is "I do not handle myself well in social gatherings". After the recoding, a total score can be calculated by summing up all the elements, with a high score indicating more social self-efficacy expectations. Here, 30 represents the highest possible score and 5 the lowest. In a follow-up study, Sherer and Adams (1983) assessed the subscale among 101 subjects measuring a mean score of 21.20 (*SD*=3.63). They documented the criterion validity by showing that the social self-efficacy subscale has predicted past vocational success and construct validity by comparing it to already established measures (Sherer et al., 1982). All questionnaires can be found in their entirety in Appendix B.

Procedure

Participants were recruited either by the researchers providing them with a link or via Sona-System and SurveyCircle redirecting them to the questionnaire. After giving informed consent (see Appendix A), they answered a few questions regarding demographics. Afterwards, the described scales were administered. First, participants filled in questions regarding their mental Health and later regarding their physical health. At the end of the survey, they received further information on the specific theses and were thanked for their participation. For people coming from the SurveyCircle website, a code was displayed to redeem points. Overall, filling in all questionnaires took about 25 minutes.

Data Analysis

SPSS version 27 was used to conduct the following analyses. To begin with, participants that failed to meet the inclusion criteria were removed from the final dataset. Participants were removed from the dataset when they indicated to not have had a relative in the ICU, if they did not

finish all relevant questionnaires, did not confirm the consent form or if their relatives' stay in the ICU was more than 18 months ago. A table with an overview of the sample characteristics is made including the characteristics of the ICU stay (e.g., timespan etc.). To do so, descriptive statistics of the continuous characteristics (e.g., age) were calculated and frequencies for the categorical (e.g., type of relative).

Next, as items one, three and five of the SES are negatively framed, they need recoding (see Appendix B). The descriptive statistics of every scale were calculated including the minimum, maximum, mean total scores with standard deviations, the skewness and kurtosis. Furthermore, ANCOVA was used to control for potential covariates such as the relationship with the relative, the number of stays, the length of the stay and the needs for further care of the relative. To do so, the relationship variable had to be recoded into a dummy variable and a correlation matrix was established to identify potential covariates.

Additionally, the reliability and validity of the HADS, MSPSS and SES were tested using Cronbach's alpha and a factor analysis. Results for Cronbach's alpha above .7 indicate a good internal consistency (Tavakol and Dennick, 2011). To clarify relationships between factors, the factor loadings are interpreted using varimax rotation. Before the testing of the hypotheses, the assumption of normally distributed mean scores of the dependent variable for the moderation analysis was tested, namely anxiety (Li, Wong, Lamoureux, & Wong, 2012). The assumption was tested displaying a histogram and running the Shapiro-Wilk test, rejecting the null hypothesis when the results are significant ($p < .05$). Finally, the independent variable social support as well as the moderator self-efficacy were centralized to reduce collinearity between the main and the interaction effect. Afterwards, hypothesis testing began (see Appendix C for SPSS Syntax).

The first hypothesis, that young relatives show decreased symptoms of anxiety with increasing months following the release of the family member, was tested performing an ANOVA comparing the mean anxiety scores across time.

Finally, the second hypothesis was tested. It was expected that social self-efficacy moderates the relationship between social support and anxiety. To assess this, the interaction effect needed to be tested. As all variables are continuous, a multiple regression analysis using the Model 1 Process Macro for SPSS by Andrew F. Hayes (2017) was performed. To test the moderating, social support was used as the independent variable, social self-efficacy as the moderator and

anxiety as the dependent variable. The hypothesis would be accepted when the interaction effect is significant ($p < .05$).

Results

Stripping of Data

Before the actual testing of the hypotheses, the data was stripped and explored. Table 2 shows the participants that had to be removed due to the exclusion criteria. It can be seen that more than half of the participants had to be excluded from the original dataset. Afterwards, the data of the remaining participants (n=53) was examined further.

Table 2
Initial stripping of data (N=129)

Exclusion Criteria	*N*
Did not finish demographics/ consent	48
Indicated to have no relative in the ICU	24
Number of stays: zero	2
Stay more than 18 months ago	2

Of the remaining participants, four had to be removed after an exploration of the data identified them as outliers (see Appendix D, for boxplots). Additionally, it must be noted that of the remaining participants, twelve did not finish the entire survey. To explore possible reasons, a post-hoc analysis using an independent *t*-test was conducted comparing the participants who did not finish the questionnaire (N =12*)* to those who did (N=39*)*. However, the scales were tested for normality for both groups first.

The Shapiro-Wilk test indicated that the mean scores of the HADS subscale were normally distributed for the group that finished the survey [W (37) = .98, p = .57] and for the group that did not finish [W (12) = .95, p = .60]. Similar results were found for the mean scores of the social self-

efficacy scale. The data of the group that answered all questions was also normally distributed [W (37) = .97, p = .45] as well as for the group that had missing items [W (8) = .93, p = .48]. However, results for the MSPSS scale indicated that for participants that finished the survey [W (37) = .92, p = .01] and for participants that did not finish [W (9) = .81, p = .03] the null hypothesis that the data is distributed normally had to be rejected. These variables had to be transformed using independent log transformation to account for the sensibility of the t-test to non-normality.

Afterwards, the t-test was conducted. Table 3 shows that no significant difference in means was measured. As the sample sizes differ significantly, Levene's test of homogeneity of variances was run as well. The results indicate that the null hypothesis of equal population variances can be accepted for the relevant variables of anxiety [F (1,47) = 3.17, p = .08], social support [F (1,44) = .02, p = .90] and self-efficacy [F (1,43) = .55, p = .46]. Therefore, the assumption of homogeneity of variance is met for all variables. Based on these results indicating no significant difference between the two groups, participants who filled in all relevant questions for the hypotheses were included in the final dataset (n=42).

Table 3

Results of t-test for Equality of Means

	Finished		Dropped Out		
	M	*SD*	*M*	*SD*	*t*-test
Anxiety	19.91	3.06	11.25	1.96	.35
Logarithmic social support	1.85	.07	1.86	.07	.63
Social self-efficacy	19.05	3.80	17.00	5.01	-1.31

*p <.05.

The final Dataset

Table 4 displays the descriptive statistics of this final dataset. The result of the Shapiro-Wilk test for the dependent variable of anxiety was not significant [W (42) = .98, p = .55], therefore the null hypothesis that the mean scores are normally distributed is not rejected and no transformation for normality was needed.

Table 4

Mean scores and standard deviations of time since discharge, anxiety, social support and social self-efficacy (N=42)

Subscale	Min	Max	*M*	*SD*	Skewness	Kurtosis
Time since discharge (months)	0 (0)*	17 (18)*	6.64	4.58	.18	-1.24
Anxiety	5 (0)*	17 (21)*	10.86	2.93	.14	-.39
Perceived social support	50 (12)*	84 (84)*	71.17	10.28	-.52	-.91
Social self-efficacy	11 (6)*	29 (30)*	19.02	3.91	.28	-.14

*lowest/ highest possible score.

Testing of potential Covariates

Table 5 displays the correlation matrix between the main variables and all potential covariates. None of the four main variables of time, anxiety, social support, and social self-efficacy significantly correlate. However, a minor significant correlation between the variables social support and the relative being an aunt/ uncle (r = .32) as well as between the social self-efficacy variable and the relative being a cousin (r = .33) and the relative needing a formal caregiver (r = .38) can be seen. All other significant correlations do not include either of the main four variables and are therefore not included as covariates in the following analyses.

Table 5

Correlation Matrix between main variables and potential covariates

	N	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1. Time	42	--																
2. Anxiety	42	-.13	--															
3. Perceived social support	42	.13	-.15	--														
4. Social self-efficacy	42	.07	-.18	.29	--													
5. Number of admissions	42	-.22	-.20	-.02	.21	--												
6. Stay duration	42	.14	.03	.13	.27	.25	--											
7. is child	42	.18	.06	.20	-.16	-.05	-.13	--										
8. is parent	42	.01	.10	.02	.03	-.11	-.22	-.09	--									
9. is grandparent	42	-.05	-.22	.22	.16	-.05	.19	-.14	-.48**	--								
10. is sibling	42	.14	.05	-.27	-.26	-.08	.12	-.03	-.13	-.19	--							
11. is aunt/ uncle	42	.00	.02	-.32*	-.30	-.14	-.16	-.06	-.23	-.35*	-.09	--						
12. cousin	42	-.08	-.05	.03	.33*	.49**	.27	-.04	-.16	-.24	-.06	-.11	--					
13. is other	42	-.08	.24	.06	.06	.08	-.09	-.03	-.13	-.19	-.05	-.09	-.06	--				
14. family	42	-.08	.21	.01	-.08	-.12	.18	.23	-.01	-.06	-.15	-.13	.01	.33*	--			
15. caregiver	42	-.23	-.30	.23	.38*	.00	.12	-.03	-.13	.26	-.05	-.09	-.06	-.05	-.15	--		
16. passed	42	.20	-.06	-.16	-.03	-.16	-.26	-.12	-.09	.01	.29	.10	-.03	-.18	-.53**	-.18	--	
17. no	42	-.02	-.01	.05	-.06	.30	.04	-.09	.18	-.08	-.13	.07	.05	-.13	-.40**	-.13	-.47**	--

Note. Pearson's *r* was calculated to examine the association between the variables. * $p < .05$ ** $p < .001$.

Validity and Reliability of Scales

To conclude the exploration of data, the validity and reliability of the three scales was assessed. The Bartlett's test of sphericity indicated that overall, the correlations within the correlation matrix were significant for anxiety [$\chi^2(91)=224.12$, $p<.001$], social support [$\chi^2(66)=487.80$, $p<.001$] and social self-efficacy [$\chi^2(15)=39.84$, $p<.001$]. The results of the Kaiser-Meyer-Olkin test for sampling adequacy indicated that the strength of the relationship among variables was mediocre for the variables anxiety (*KMO*=.79), social support (*KMO*=.76) and social self-efficacy (*KMO*=.62). This indicated a sufficient fit of the factor model for this sample. Therefore, the factor analyses were run for all three scales.

First, for the HADS, the scree plot and eigenvalue criterion ($ev \geq 1$) indicated four factors. Item four, "I can sit at ease and feel relaxed", of the anxiety subscale loaded negatively on one of the factors despite being formulated positively and was therefore excluded from the final analyses. Second, scree plot and eigenvalue criterion indicated the expected three factors for the MSPSS. Together all three factors accounted for 84.38% of the variance with each one accounting for approximately the same proportion. Lastly, scree plot and eigenvalue criterion of the SES subscale indicated two factors instead of one. The factor analysis yielded that the first factor accounts for 35.38% of the variance while together both factors explain 57.78%. However, all items loaded correctly with the already reversed items loading positively.

The results of the reliability scores differed among the scales. To begin with, the reliability test for the HADS was run twice. The first test was run with the entire scale, indicating no sufficient result (α=-.16). However, the second time it was run without the previously mentioned item four that falsely scored negative. Now, Cronbach's alpha indicated better reliability (α=.71). Additionally, while the Cronbach's alpha score was high for the MSPSS scale (α=.90), the score for the SES subscale was low and barely acceptable (α=.59).

Testing of Hypothesis 1

Before running the moderation analysis, the first hypothesis was tested. Table 6 displays the ANOVA between time since discharge and symptoms of anxiety. Results show that the first hypothesis expecting a negative association between time and symptoms of anxiety in family

members following the release from the ICU must be rejected as the association is not statistically significant (p=.44). Afterwards, the moderation analysis was run.

Table 6

ANOVA results with parameter estimates for DV = anxiety, IV = time since discharge

Parameter	*B*	*SE*	*t*	*p*	*LLCI***	*ULCI***
Intercept	9.29	.50	18.57	.00	8.29	10.29
Time	-.09	.11	-.78	.44	-.31	.14

**R squared* = .01 (*Adjusted R squared* = -.01), $F(1, 40) = .60$, $p = .44$.

** 95% lower/ upper limit confidence interval.

Testing of Hypothesis 2

The outcomes of the moderation analysis indicate that the second hypothesis stating that social self-efficacy moderates the relationship between perceived social support and anxiety must be rejected as the interaction effect is minor and not significant (p=.51) (see Table 7).

Table 7

Results of moderator model with parameter estimates for DV = anxiety, IV = social support and moderator = social self-efficacy as well as potential covariates

Parameter	Coefficient	*SE*	*t*	*p*	*LLCI***	*ULCI***
Intercept	9.63	0.60	15.96	.00	9.02	10.23
Perceived social support	-.03	.06	-.53	.60	-.09	.03
Social self-efficacy	-.08	.16	-.50	.62	-.24	.08
Interaction effect	-.01	.01	-.67	.51	-.02	.00
Relative is aunt/ uncle	-.41	1.58	-.26	.80	-2.00	1.17
Relative is cousin	-.74	2.15	-.34	.73	-2.89	1.42
Need for caregiver	-2.60	2.87	-.91	.37	-5.46	.27

* *R squared* =.08 (*Adjusted R squared* =.01), $F(3, 38) = 1.12$, $p < .35$.

** 95% lower/ upper limit confidence interval.

Discussion

This study aimed to expand the current knowledge on anxiety symptoms of the PICS-F in young relatives of former ICU patients. This was done by examining the moderation of social self-efficacy of the association between perceived social support and symptoms of anxiety. Also, it aimed to extend the knowledge on these symptoms to 18 months following the release. Both hypotheses were rejected as the results showed no significant association between the variables time and anxiety, as well as no significant moderation effect of social self-efficacy on perceived social support and anxiety. Therefore, the aim of the current study was not fully accomplished. Based on the results, one would expect no association between time since relative discharge and anxiety as well as no moderation of social self-efficacy on the association of perceived social support and anxiety within young adult relatives. However, these results are not in line with previous findings, making it necessary to look at additional studies.

First, an association between time and symptoms of anxiety in family members following the release has been shown in several studies. Davidson et al. (2012) note a difference in reviewed studies regarding the decrease on anxiety symptoms. While most studies have found a general decrease in symptoms with time progressing, some studies note that participants showed more severe symptoms within the first three months and only then the symptoms decrease. In the current study, several participants indicated that the release from the ICU was within the last three months. However, no increase within the first three months was noted as well as no significant general decrease over time. Therefore, the results did not support either of the two common previous results.

Second, the results of the factor analysis for the HADS did not match previous research. Even though the Kaiser-Meyer-Olkin value indicated that the data showed a sufficient fit for factor analysis, the results were not in line with other studies. One of the anxiety subscale items loaded negatively (Item four: “I can sit at ease and feel relaxed”) and four factors instead of two were noted. While many studies conclude good validity and reliability results, they mainly use both subscales. Spinhoven et al. (1997) show a high correlation between the two subscales and suggests that both scales are better used combined. Additionally, they note a minor correlation to older age but conclude a good fit for young adults. Therefore, the HADS may still be used to assess anxiety within the target group but with an additional depression scale which has very good construct

validity, such as the self-rating depression scale of nonclinical cases (Zung, 1965). This can control for the correlation of the two subscales of the HADS and the comorbidity of anxiety and depression.

Next, the outcomes of the moderation analysis can be considered somewhat in line with the most recent research. Carmeli et al. (2020) noted social self-efficacy to be a moderator of the association between receiving social support and vitality in young adults. However, they also note that the interaction effect was only there for the participants who scored low on social self-efficacy. This may be a possible reason for not finding a significant interaction effect in the current study as it also included high social self-efficacy scores. This is also in line with research by Krause, Pargament and Ironson (2017). Social support was found to be an effective coping resource, however only for certain personality types. They found that spiritual social support moderates the relationship between stress and anxiety for people scoring high on extraversion. Participants scoring high on extraversion were able to utilize their social surrounding more effectively. This is supported by Riaz Ahmad et al. (2014) stating that people scoring high on social self-efficacy are better at satisfying their needs from their social environment whereas people scoring low may need additional support, e.g., from hospital personnel.

Lastly, based on the current findings and the social cognitive theory, the proposed moderation model may be adapted. The results showed a very high social support score with a minimum score of 50 out of 84. It is possible that the model must be adapted by including age differences. Trouillet, Gana, Lourel, & Fort (2009) note that with increasing age participants report lower social support satisfaction, possibly explaining the high scores found in this study because participants were relatively young overall (18 to 29). However, one may also differentiate between perceived social support and the satisfaction of the experienced support. Next, Trouillet et al. (2009) emphasize an instability of self-efficacy scores over time as it changes with the environment and increasing age. They emphasize that coping strategies, such as the utilization of social support, differ regarding expected age associated changes and sudden changes in the environment. The results showed that many of the participants indicated that the relative in the ICU was their grandparent. This could be interpreted as an expected age associated change and may not have had the same impact on their anxiety scores.

The fluctuation of social support and self-efficacy regarding age goes along with several other studies. For example, Bandura (1994) shows an association between age and an increasing fluctuation of self-efficacy scores. Lang, Featherman, & Nesselroade (1997) also note great

individual differences regarding fluctuations of self-efficacy as well as social support. However, results by Ong, Bergeman, & Boker (2009) indicate that with increasing age people are more likely to display higher social self-efficacy scores with respect to their ability to utilize their social surrounding. This would go along with the suggestion that young adults may benefit more from receiving additional social support and not their usual social surrounding whereas older adults can utilize their usual surrounding better.

Strengths and Limitations

Several strengths and limitations can be noted for the current study. One may first comment on the main strength of this research, the novelty. First, limiting the target group to participants between the ages of 18 and 29 has not yet been done within the context of anxiety symptoms of the PICS-F. While it has been noted several times that one of the main health related threats to young adults are symptoms of mental health disorders such as anxiety, they have not yet been put in the context of the PICS-F (Bovier, Chamot, & Perneger, 2004). Second, extending the time to 18 months is also novel. Even though some studies have focused on symptoms of the PICS-F for up to four years, they have not yet focused specifically on symptoms of anxiety within a time span of more than 12 months. Lastly, assessing the moderation of social self-efficacy on the association between perceived social support and anxiety has also not yet been done. However, limitations may also be noted.

First, one may note that the sample was not very diverse. It consisted of mainly female German participants. Additionally, both Sona-System as well as SurveyCircle are used by university students and researchers. Therefore, based on the age group, it can be expected that most of the participants were students. The homogeneity of the sample can also be noted in the mean score and standard deviation of the MSPSS. Many participants perceived very high social support and differ only slightly in their scores. Additionally, no participant reported low perceived social support. This may also be due to most participants being female as women have been found to perceive more social support than men (Dwyer and Cummings, 2007). Therefore, inferences made through this study are restricted to this homogeneous population and one would have to conduct new studies to apply the findings to other groups.

To conclude the limitations, the results of this report are based on self-administered online questionnaires with the participants not being monitored during the study. It cannot be ruled out

that people gave socially desirable answers or lost concentration after a while, especially since the questionnaire was relatively long due to its collaborative nature. This may also be a possible reason for the large number of participants that dropped out. The post-hoc analysis did not indicate a difference in groups, therefore an increasing lack of interest or decreasing concentration may be a possible reason influencing the later questions of the survey.

Future Research

Following the results and integrated previous findings, two main possibilities for future research arise. First, one could follow the study by Carmeli et al. (2020) more closely. Therefore, assessing not the perceived social support of the participants' usual social surrounding but more specifically additional social support, e.g., by the hospital staff or formal caregivers. One could then also differentiate between people scoring high on social self-efficacy and those scoring low, comparing the two groups. It would be expected that social self-efficacy moderates the association between social support and anxiety, however only for people scoring low on social self-efficacy.

Second, one could also focus on a moderated moderation, i.e., a moderation model that differs for certain groups. Based on the findings by Krause et al. (2017), stress may be included as a variable. They suggest that social support moderates the association between stress and anxiety but that the moderation differs for extroverts and introverts. One would then build directly onto their research by applying a more specific target group, namely young family members of former ICU patients.

Some general suggestions apply to both possibilities. For example, the homogeneity of the sample could be reduced by using more recruitment platforms. Furthermore, future studies could include a variety of social support scores as part of the selection criteria, therefore making sure that low scores are also included in the analyses. Lastly, an additional depression scale could be used. One could then control for the correlation of the two subscales of the HADS.

Conclusion

Contrary to previous findings, the current study did not find an association between time since patient discharge from the ICU and symptoms of anxiety in young relatives (18-to-29-year-olds). Additionally, social self-efficacy did not moderate an association between perceived social support and anxiety in young people within the last 18 months. Yet, it may indicate that young

adults differ in the utilization of their usual social support and may benefit more from receiving additional support. Therefore, future studies could not only focus on providing the family members with additional social support during the hospital stay, but also afterwards. Further, different personality types may be included in future studies to account for the possible differences.

The study contributes to the limited amount of research on this target group within the context of the PICS-F. Over time, these insights could lead to the development of more tailored interventions to prevent PICS-F development or reduce its symptoms using social support.

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Appendix

Appendix A

Consent Form for Participation in a Study
University of Twente

Survey on Health: A comparison between young adults with relatives as former ICU patients

Description of the research and your participation

You are invited to participate in a research study conducted by Anita Suntharalingam, Luca Marie Schlieper, Lena Fitzian, Joana Grahl, Mirjam Kühne, and Leona Rudolph. This study is part of our bachelor theses that we are writing, under supervision of Jorinde Spook, PhD (Assistant Professor, Health Psychology & Technology at the University of Twente).
Please read the following instructions carefully, as it informs you about the purpose of the study, your task and the way we would like to use your information.

About this research:

As the admission of a patient to the Intensive Care Unit (ICU) also impacts the patients' family members, it is important to gain more thorough understanding of the wellbeing of these relatives. Especially young adults in the age category of 18-29 years old are underrepresented in the current body of research. Therefore, we aim to study different (mental and physical) health-related concepts in relation to an ICU-admission of a relative in the past 12 months (i.e., symptoms of anxiety, depressive feelings, quality of life, sleep disturbance, eating pattern, and stress), completed with questions about social support, flourishing, self-efficacy, and coping strategies. Filling in the questionnaire will take about 30 minutes.

Before we begin, some aspects of the research are explained and how we will handle the data.
There are **no known risks** associated to this survey research.
There are **no known benefits** to you that would result from your participation in this research.
We are targeting **healthy individuals** that are **not undergoing any treatment** for depression, anxiety or PTSD.
We are interested in **your own personal experiences**. This means that there are no right or wrong answers: you are the expert on this subject.
Each of the researchers will write a bachelor thesis report concerning their topic of research. These theses will be assessed by our first and second supervisor. Furthermore, we only report anonymous, analyzed data in our theses. The final (anonymous) dataset may be used by future students of the University of Twente to continue studying the topic.
Your participation in this research study is **voluntary**. You may choose not to participate, and you may withdraw your consent to participate at any time. You will not be penalized in any way should you decide not to participate or to withdraw from this study. You are allowed to withdraw the study at any time without stating any reason.

Figure A1. *Informed Consent Beginning.*

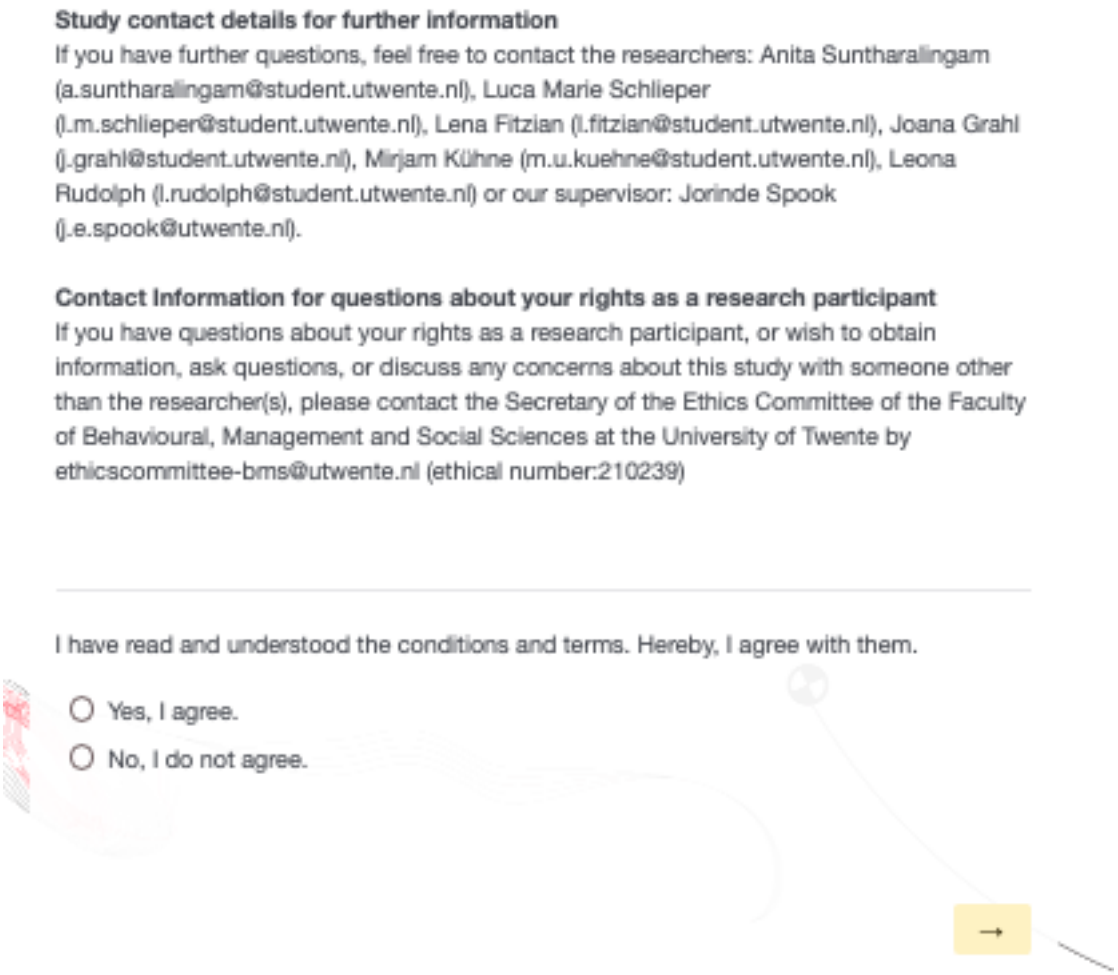


Figure A2. *Informed Consent End*.

Appendix B

The following questions are going to assess how you have been feeling during the last month. Please mark the boxes that best describe your emotions and thoughts during this time.

B1. *HADS Beginning.*

	Not at all	Not often	A lot of the time	Most of the time
I feel tense or 'wound up'	○	○	○	○
I still enjoy the things I used to enjoy	○	○	○	○
I get a sort of frightened feeling as if something awful is about to happen	○	○	○	○
I can laugh and see the funny side of things	○	○	○	○
Worrying thoughts go through my mind	○	○	○	○
I feel cheerful	○	○	○	○
I can sit at ease and feel relaxed	○	○	○	○
I feel as if I am slowed down	○	○	○	○
I get a sort of frightened feeling like 'butterflies' in the stomach	○	○	○	○
I have lost interest in my appearance	○	○	○	○
I feel restless as I have to be on the move	○	○	○	○
I look forward with enjoyment to things	○	○	○	○
I get sudden feelings of panic	○	○	○	○
I can enjoy a good book or radio or TV program	○	○	○	○

B2. *HADS End.*

In the following you will be asked a few questions about your social surroundings.

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
There is a special person who is around when I am in need.	○	○	○	○	○	○	○
There is a special person with whom I can share joys and sorrows.	○	○	○	○	○	○	○
My family really tries to help me.	○	○	○	○	○	○	○
I get the emotional help & support I need from my family.	○	○	○	○	○	○	○
I have a special person who is a real source of comfort to me.	○	○	○	○	○	○	○
My friends really try to help me.	○	○	○	○	○	○	○

B3. *MSPSS Beginning.*


I can count on my friends when things go wrong.
I can talk about my problems with my family.
I have friends with whom I can share my joys and sorrows.
There is a special person in my life who cares about my feelings.
My family is willing to help me make decisions.
I can talk about my problems with my friends.

B4. *MSPSS End.*

In the following you will be asked a few questions regarding your behaviour in social situations.

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
It is difficult for me to make new friends	○	○	○	○	○
If I see someone I would like to meet, I go to that person instead of waiting for him or her to come to me	○	○	○	○	○
If I meet someone interesting who is hard to make friends with, I'll soon stop trying to make friends with that person	○	○	○	○	○
When I'm trying to become friends with someone who seems uninterested at first, I don't give up easily	○	○	○	○	○
I do not handle myself well in social gatherings	○	○	○	○	○
I have acquired my friends through my personal abilities at making friends	○	○	○	○	○

B5. *SES.*

Appendix C

```
* Encoding: UTF-8.
DESCRIPTIVES VARIABLES= Gender Age Nationality D4 D5 D6 D7 D8 D9
  /STATISTICS=MEAN STDDEV Min Max.

*recoding of negatively framed self-efficacy items
RECODE SSE_1 (1=5) (2=4) (3=3) (4=2) (5=1) INTO SSE_1rev.
Execute.
RECODE SSE_3 (1=5) (2=4) (3=3) (4=2) (5=1) INTO SSE_3rev.
Execute.
RECODE SSE_5 (1=5) (2=4) (3=3) (4=2) (5=1) INTO SSE_5rev.
Execute.

*computing sum scores for SSE scale
COMPUTE SSE= SSE_1rev + SSE_2 + SSE_3rev + SSE_4 + SSE_5rev + SSE_6.
EXECUTE.

*computing social support sum score and subscales
COMPUTE PSS_All= PSS_1 + PSS_2 + PSS_3 + PSS_4 + PSS_5 + PSS_6 + PSS_7 + PSS_8 +
PSS_9 + PSS_10 + PSS_11 + PSS_12.
EXECUTE.
COMPUTE PSS_Family= PSS_3 + PSS_4 + PSS_8 + PSS_11.
EXECUTE.
COMPUTE PSS_Friends= PSS_6 + PSS_7 + PSS_9 + PSS_12.
EXECUTE.
COMPUTE PSS_Other= PSS_1 + PSS_2 + PSS_5 + PSS_10.
EXECUTE.

*Computing Anxiety sum score
COMPUTE HADS_A= HADS_1 + HADS_3 + HADS_5 + HADS_7 + HADS_9 + HADS_11 +
HADS_13.
```

```
EXECUTE.

*Exploring DATA + Outliers
EXAMINE VARIABLES=D5
  /PLOT BOXPLOT STEMLEAF NPPLOT
  /COMPARE GROUPS
  /STATISTICS DESCRIPTIVES EXTREME
  /CINTERVAL 95
  /MISSING LISTWISE
  /NOTOTAL.
EXAMINE VARIABLES=HADS_A
  /PLOT BOXPLOT STEMLEAF NPPLOT
  /COMPARE GROUPS
  /STATISTICS DESCRIPTIVES EXTREME
  /CINTERVAL 95
  /MISSING LISTWISE
  /NOTOTAL.
EXAMINE VARIABLES=PSS_All
  /PLOT BOXPLOT STEMLEAF NPPLOT
  /COMPARE GROUPS
  /STATISTICS DESCRIPTIVES EXTREME
  /CINTERVAL 95
  /MISSING LISTWISE
  /NOTOTAL.
EXAMINE VARIABLES=SSE
  /PLOT BOXPLOT STEMLEAF NPPLOT
  /COMPARE GROUPS
  /STATISTICS DESCRIPTIVES EXTREME
  /CINTERVAL 95
  /MISSING LISTWISE
  /NOTOTAL.
```

```
*Distribution by finished and not finished
GRAPH
  /HISTOGRAM(NORMAL)=D5
  /PANEL COLVAR=Finished COLOP=CROSS.
GRAPH
  /HISTOGRAM(NORMAL)=HADS_A
  /PANEL COLVAR=Finished COLOP=CROSS.
GRAPH
  /HISTOGRAM(NORMAL)=PSS_All
  /PANEL COLVAR=Finished COLOP=CROSS.
GRAPH
  /HISTOGRAM(NORMAL)=SSE
  /PANEL COLVAR=Finished COLOP=CROSS.

*examination of variables (Shapiro-Wilk test)
EXAMINE VARIABLES=D5 SSE PSS_All HADS_A BY Finished
  /PLOT BOXPLOT STEMLEAF HISTOGRAM NPPLOT
  /COMPARE GROUPS
  /STATISTICS DESCRIPTIVES
  /CINTERVAL 95
  /MISSING PAIRWISE
  /NOTOTAL.

*transformation of PSS
COMPUTE PSS_All_Log=Lg10(PSS_All).
EXECUTE.


*t-test HADS
T-TEST GROUPS=Finished(0 1)
```

```
  /MISSING=ANALYSIS
  /VARIABLES=HADS_A
  /ES DISPLAY(TRUE)
  /CRITERIA=CI(.95).

*T-test PSS
T-TEST GROUPS=Finished(0 1)
  /MISSING=ANALYSIS
  /VARIABLES=PSS_All_Log
  /ES DISPLAY(TRUE)
  /CRITERIA=CI(.95).

*t-test SSE
T-TEST GROUPS=Finished(0 1)
  /MISSING=ANALYSIS
  /VARIABLES=SSE
  /ES DISPLAY(TRUE)
  /CRITERIA=CI(.95).

*t-test D5
T-TEST GROUPS=Finished(0 1)
  /MISSING=ANALYSIS
  /VARIABLES=D5
  /ES DISPLAY(TRUE)
  /CRITERIA=CI(.95).

*homogeneity of variance by finished not finished
ONEWAY D5 HADS_A PSS_All_Log SSE BY Finished
  /STATISTICS HOMOGENEITY
  /MISSING ANALYSIS
  /CRITERIA=CILEVEL(0.95).
```

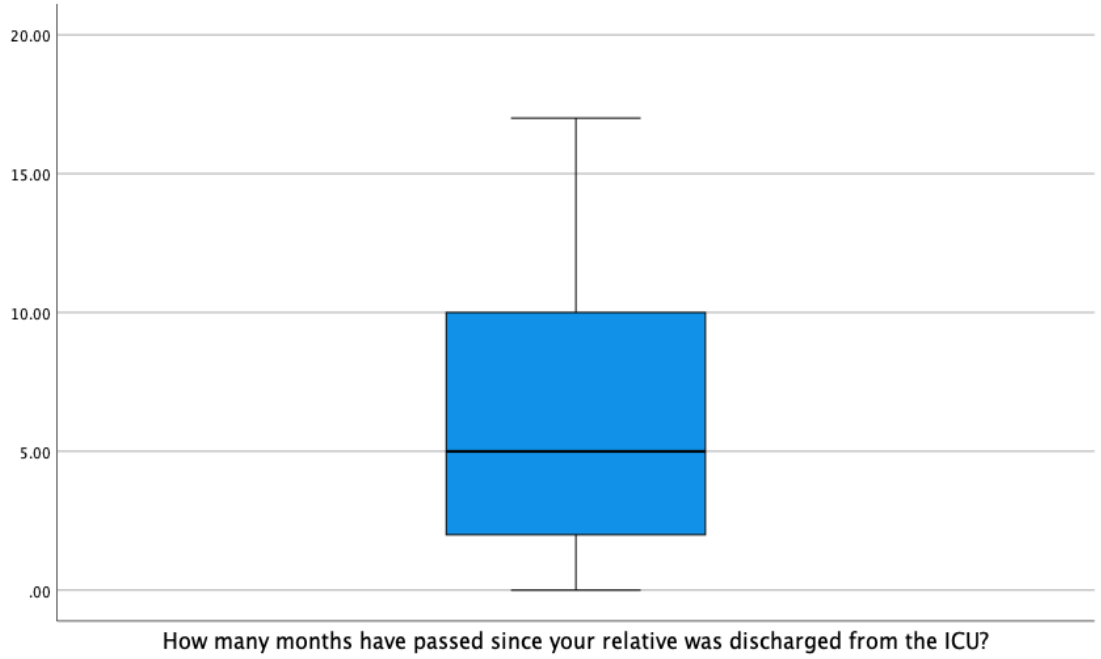
```
*Descriptives of final dataset
DESCRIPTIVES VARIABLES=D5 SSE HADS_A PSS_All
  /STATISTICS=MEAN STDDEV MIN MAX KURTOSIS SKEWNESS.

*Shapiro-wilk test for dependent (anxiety) + normality
EXAMINE VARIABLES= HADS_A
  /PLOT BOXPLOT STEMLEAF HISTOGRAM NPPLOT
  /COMPARE GROUPS
  /STATISTICS DESCRIPTIVES
  /CINTERVAL 95
  /MISSING PAIRWISE
  /NOTOTAL.
GRAPH
  /HISTOGRAM(NORMAL)=HADS_A
  /PANEL COLVAR=Finished COLOP=CROSS.

*create dummies for correlation
SPSSINC CREATE DUMMIES VARIABLE=D6
ROOTNAME1=D6
/OPTIONS ORDER=A USEVALUELABELS=NO USEML=NO OMITFIRST=NO.
SPSSINC CREATE DUMMIES VARIABLE=D9
ROOTNAME1=D9
/OPTIONS ORDER=A USEVALUELABELS=NO USEML=NO OMITFIRST=NO.

*correlation matrix
CORRELATIONS
  /VARIABLES=D5 HADS_A PSS_All SSE D8 D7 D6_Child D6_Parent D6_Grandparent
D6_Sibling D6_Aunt
    D6_Cousin D6_Other D9_byFamily D9_byCaregiver D9_3_passed D9_4_no
  /PRINT=TWOTAIL NOSIG LOWER
```

```
 /MISSING=PAIRWISE.

*reliability and validity HADS
RELIABILITY
 /VARIABLES=HADS_1 HADS_2 HADS_3 HADS_4 HADS_5 HADS_6 HADS_7 HADS_8
HADS_9 HADS_10 HADS_11 HADS_12
   HADS_13 HADS_14
 /SCALE('ALL VARIABLES') ALL
 /MODEL=ALPHA.
FACTOR
 /VARIABLES HADS_1 HADS_2 HADS_3 HADS_4 HADS_5 HADS_6 HADS_7 HADS_8
HADS_9 HADS_10 HADS_11 HADS_12
   HADS_13 HADS_14
 /MISSING LISTWISE
 /ANALYSIS HADS_1 HADS_2 HADS_3 HADS_4 HADS_5 HADS_6 HADS_7 HADS_8
HADS_9 HADS_10 HADS_11 HADS_12
   HADS_13 HADS_14
 /PRINT KMO ROTATION
 /FORMAT BLANK(.40)
 /PLOT EIGEN
 /CRITERIA MINEIGEN(1) ITERATE(25)
 /EXTRACTION PC
 /CRITERIA ITERATE(25)
 /ROTATION VARIMAX
 /METHOD=CORRELATION.
RELIABILITY
 /VARIABLES=HADS_1 HADS_3 HADS_5 HADS_9 HADS_11
   HADS_13
 /SCALE('ALL VARIABLES') ALL
 /MODEL=ALPHA.
```

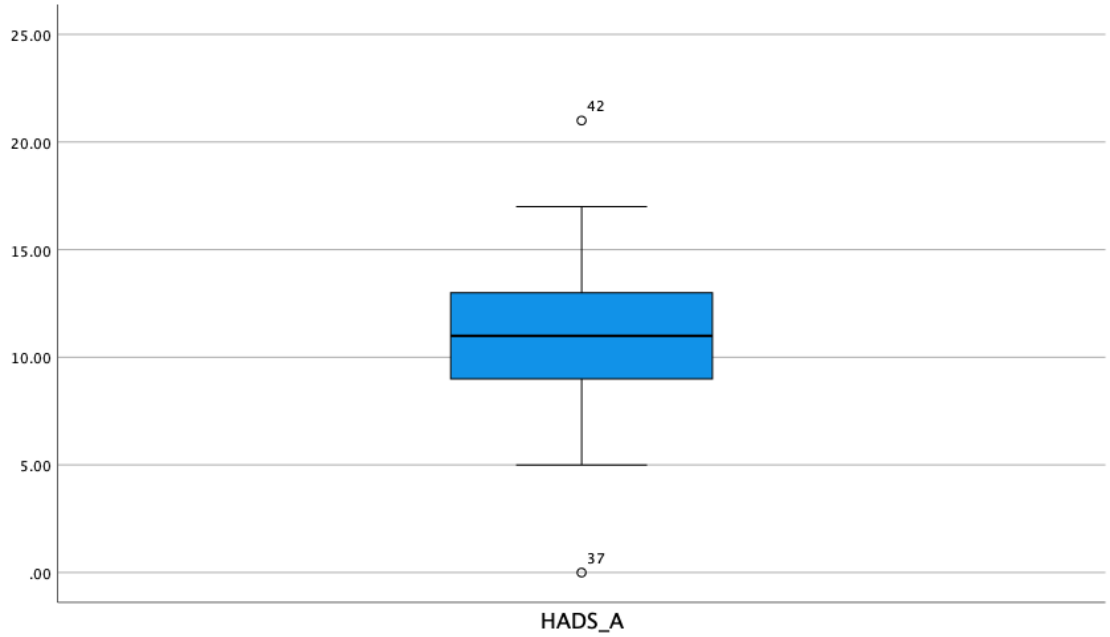
```
*reliability and validity PSS
RELIABILITY
  /VARIABLES=PSS_1 PSS_2 PSS_3 PSS_4 PSS_5 PSS_6 PSS_7 PSS_8 PSS_9 PSS_10
PSS_11 PSS_12
  /SCALE('ALL VARIABLES') ALL
  /MODEL=ALPHA.
FACTOR
  /VARIABLES PSS_1 PSS_2 PSS_3 PSS_4 PSS_5 PSS_6 PSS_7 PSS_8 PSS_9 PSS_10
PSS_11 PSS_12
  /MISSING LISTWISE
  /ANALYSIS PSS_1 PSS_2 PSS_3 PSS_4 PSS_5 PSS_6 PSS_7 PSS_8 PSS_9 PSS_10 PSS_11
PSS_12
  /PRINT KMO ROTATION
  /FORMAT BLANK(.40)
  /PLOT EIGEN
  /CRITERIA MINEIGEN(1) ITERATE(25)
  /EXTRACTION PC
  /CRITERIA ITERATE(25)
  /ROTATION VARIMAX
  /METHOD=CORRELATION.

*reliability and validity SSE
RELIABILITY
  /VARIABLES= SSE_1rev SSE_2 SSE_3rev SSE_4 SSE_5rev SSE_6
  /SCALE('ALL VARIABLES') ALL
  /MODEL=ALPHA.
FACTOR
  /VARIABLES SSE_2 SSE_4 SSE_6 SSE_1rev SSE_3rev SSE_5rev
  /MISSING LISTWISE
  /ANALYSIS SSE_2 SSE_4 SSE_6 SSE_1rev SSE_3rev SSE_5rev
  /PRINT KMO ROTATION
```

```
  /FORMAT BLANK(.40)
  /PLOT EIGEN
  /CRITERIA MINEIGEN(1) ITERATE(25)
  /EXTRACTION PC
  /CRITERIA ITERATE(25)
  /ROTATION VARIMAX
  /METHOD=CORRELATION.

*HADS without item 4
COMPUTE HADS_A_7= HADS_A - HADS_7.
EXECUTE.

*Hypothesis 1
UNIANOVA HADS_A_7 WITH D5
  /METHOD=SSTYPE(3)
  /INTERCEPT=INCLUDE
  /PRINT F PARAMETER
  /CRITERIA=ALPHA(.05)
  /DESIGN=D5.


*Hypothesis 2 (Moderation)
    Hayes Macro
```

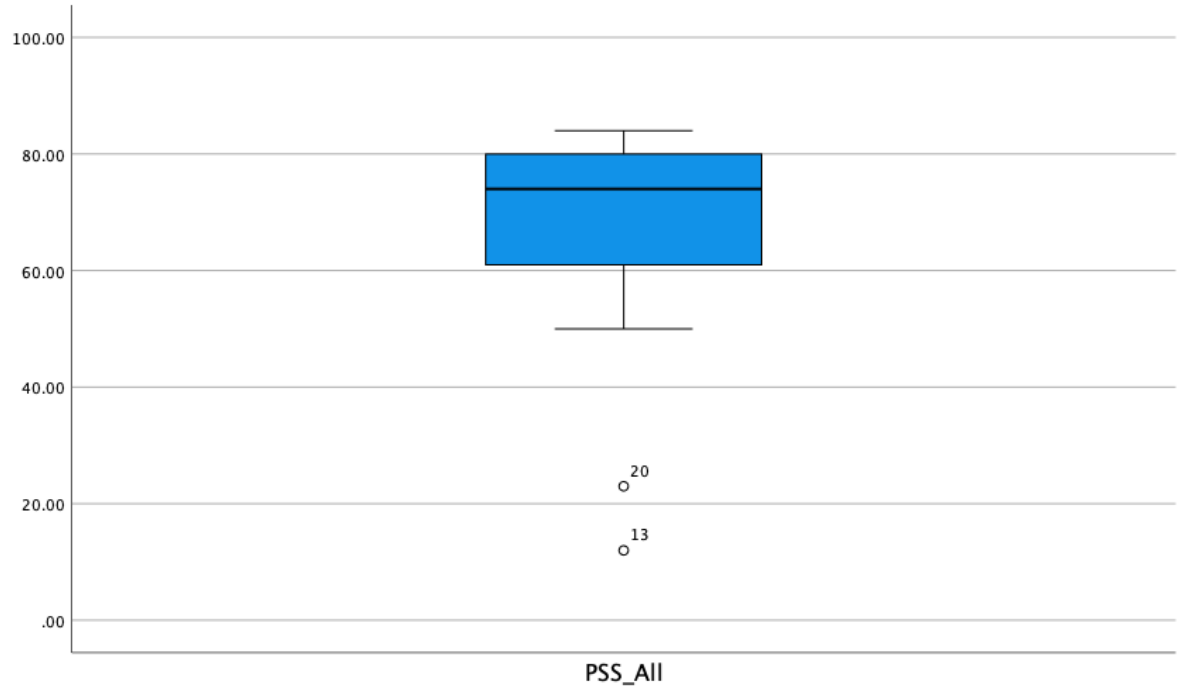
Appendix D



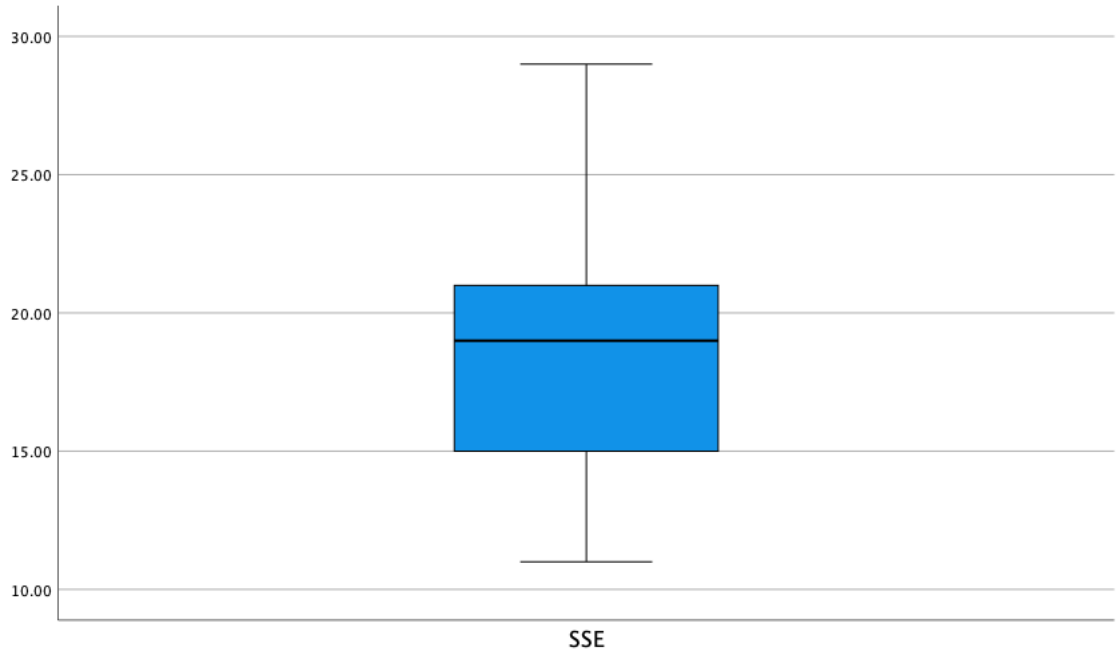
D1. *Boxplot of time since discharge.*



D2. *Boxplot of HADS_A.*



D3. *Boxplot of MSPSS.*



D4. *Boxplot of SES.*