Research Article

Comparison of Nursing and Mechanical Engineering Students' Codependency Levels[*]

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Abstract

This study aims to determine and compare nursing students' and mechanical engineering students' codependency levels and the factors that affect codependency. This study is designed as a descriptive-comparative research. Data has been collected using an information form and the Codependency Assessment Tool (CODAT). Higher scores indicate higher levels of codependency. The sample consists of 283 undergraduate students who voluntarily participated in this study. The data has been evaluated in SPSS 11.5 using statistical tests such as frequency, mean, independent-samples t-test, and one-way ANOVA testing. Students' mean CODAT score was 51.89 (SD = 9.93). Students were found to have mild level codependency. No statistically significant difference was found to exist between total scale scores and gender, or between nursing students' and mechanical engineering students' total CODAT scores. However, mechanical engineering students had higher scores than nursing students for the hiding-self subscale. First-year students with a history of mental illness, being treated for mental illness, or current/previous alcohol or drug use who expressed having more familial problems have significantly higher scores. The results obtained from this study contribute to the literature on codependency in terms of the nature of and factors affecting codependency.

Keywords

Codependency • Codependence • Nursing • University students

The concept of codependency includes a cluster of behaviors originally identified through research on the families of alcoholic patients in the 1950s (Faltz, Davis, & Wing, 2008; Varcarolis & Smith-DiJulio, 2009). Later, this term was expanded to include men and women raised in a dysfunctional family system without substance abuse, in addition to families where substance abuse constitutes a major problem (Faltz et al., 2008). The current approach is to evaluate the pathological patterns that have been acquired for coping individually with the stressful circumstances faced while growing up in a dysfunctional family (Ancel & Kabakci, 2009; Knudson & Terrel, 2012). Knudson and Terrel (2012) define codependency as a dysfunctional pattern of relating to others with an extreme focus outside of oneself, a lack of emotional expression, and personal meaning derived from relationships with others. However, uncertainties still exist as to whether codependency should be addressed as a social behavior model, a personality disorder, a pathological problem, or a family dysfunction (Marks, Blore, Hine, & Dear, 2012).

Abadi, Vand, and Aghaee's (2015) systematic review stated that many studies had been performed between 1989 and 1999, and that afterwards the number of these studies decreased. This reason explains the uncertainty and difficulty in measuring concepts related to codependency and why codependency treatment is diminished. However, the history of codependency studies in Turkey is relatively new. As such, Altinova and Altuntas (2015) stated not finding any investigations on the concept of codependency among women in the Turkish literature.

Background

Codependency has been shown to be more common among women who have submissive cultural scripts (Noriega, Ramos, Medina-Mora, & Villa, 2008), people raised by alcoholic parents and partners (Varcarolis & Smith-DiJulio, 2009), those who had grown up in a stressful family environment (Knudson & Terrell, 2012; Reyome & Ward 2007), parents of children with behavioral disorders and mental illness (Self, 2010), caregivers of people with chronic diseases (Noriega et al., 2008), and those working in jobs aimed at helping others, especially nurses (Ancel, 2012; Martsolf, Hughes-Hammer, Estok, & Zeller, 1999). Ancel and Kabakci (2009) reported in their study that Yates and McDaniel (1994) had found moderate to severe levels of codependency in a third of nurses. People who prefer to become nurses have also been reported to play the role of problem-solver in the family and were at higher risk for developing codependency (Snow, 1997). Self's (2010) study stated that nursing has a codependency risk due to its care-giver philosophy. Being a nurse requires being sensitive to the needs of others, as well as being altruistic (Self, 2010). On the other hand, some researchers indicate that codependency might have positive impact on care giving, focusing on distinguishing between pathological behavioral patterns and their positive effects (Fuller & Warner, 2000).

Several studies in the literature have highlighted the importance of investigating the relationship of codependency with care giving, the history of nursing, working in a hospital setting, being a woman, and being a nurse trainer, particularly among Turkish nurses, the majority of whom are women (Ancel, 2012; Ancel & Kabakci, 2009; Oz, 1998). Being self-aware and planning tasks at personal, familial, and social levels while providing care for patients is important for nursing students, who constitute the risk group for codependency (Oz, 1998). Self (2010) reported that being a nurse requires being sensitive to the needs of others. However, findings from comparative studies with other professional groups that support this view have not been encountered. The reasons for choosing engineering students is because they are mostly male and are educated in a field that doesn't directly deal with taking care people. This can also help clarify the nature of codependency. Within this context, using diverse and differential samples in studies investigating codependency is required to obtain data for a proper understanding of codependency as a concept.

The purpose of this study is to identify in a Turkish sample the codependency levels of undergraduate nursing students and mechanical engineering students. The study's questions include the following:

Question 1. Is there a significant difference in the codependency total and subscales scores of students' according to gender?

Question 2. Is there a significant difference in the codependency total and subscales scores of students' according to: (a) school or (b) year of study.

Question 3. Is there a significant difference in the codependency total and subscales scores of students' according to: (a) dysfunctional family history, (b) history of mental illness, (c) past and current treatment of mental illness, or (d) past or current history of alcohol/ substance abuse.

Method

Study Design and Study Group

This study was designed as a descriptive-comparative design. The study group consists of nursing students and mechanical engineering students who volunteered to participate in this study and were in their first to fourth year of study at a public university in a city in Turkey during the 2010-2011 academic year. Out of 431 students, a total of 283 who were continuing their education at the time of the study and who volunteered to participate in the study after being informed of its purpose constitute the study sample. Any questionnaires that were missing data were excluded from the study, resulting in a 66% response rate from the nursing and mechanical engineering students.

Instruments

Data were collected using a demographic information form and the Codependency Assessment Tool (CODAT). Demographic variables and self-reporting questions are the independent variables, whereas CODAT scores are the dependent variable.

Demographic information form. The researchers developed this form based on the current literature and previous studies. The form consists of questions related to students' demographic information (i.e., gender, age, etc.) and variables deemed to have an impact on codependency (family relationships such as anxiety, depression/ mood disturbances, panic attacks, or history of mental illness). The participants were given the opportunity to answer yes or no to questions related to their treatment history for mental illness. For yes answers, a blank area was provided, in which the participants were asked to define their problem. Other questions were based on participants' self-reports and aimed to assess their family relationships.

Codependency Assessment Tool (CODAT). The CODAT was developed by Hughes-Hammer, Martsolf, and Zeller (1998) for assessing codependency; Ancel and Kabakci (2009) adapted it to Turkish culture. The scale includes questions relevant to both men and women (Ancel, 2012; Hughes-Hammer et al., 1998). The CODAT is a 25-item, 5-point Likert-type scale. Participants are asked to record how often they feel themselves in the way indicated by the item ranging from never (1) to most of the time (5). The scale is comprised of five subscales: other focus/self-neglect, low self-worth, hiding self, medical problems, and family of origin issues (Hughes-Hammer et al., 1998). Scoring the CODAT includes calculation by adding up the responses to all 25 items. Possible scores range from 25-125 (Hughes-Hammer et al., 1998). Higher scores indicate higher levels of codependency (Ancel, 2012; Hughes-Hammer et al., 1998). Also, the scores of the scale are graded as follows: low-minimal codependency (25-50), mild codependency (51-75), moderate codependency (76-100), and severe codependency (101-125; Bynum, Boss, Schoenhofer, & Martsolf, 2012; Martsolf et al., 1999).

The psychometric properties of CODAT's Turkish form were evaluated by Ancel and Kabakci (2009). The adaptation of the scale was carried out through data collected from Turkish female nurse students ($N = 400$). To determine its validity, exploratory factor analyses were performed. Comparing the five-factor solution of the original tool revealed a similar factor structure for the Turkish version of CODAT. Five factors explain 48.38% of the variance. All items except the twelfth were loaded on the original factors. Item 12, however, was loaded on the self-worth factor instead of the medical problems factor. Internal consistency was calculated to determine the scale's reliability. The total scores for the scale's internal coefficients were calculated as Cronbach's α = .75. Additionally, Cronbach's α-values for the individual factors ranged from .62 to .78. In this study, Cronbach's α for CODAT was found to be .78.

Statistical Analysis

Data analysis was performed using SPSS 21.0 for Windows as licensed to Istanbul University. The research questions were analyzed during the independent-samples *t*-test; one-way ANOVA testing and the Mann-Whitney *U* were performed in order to determine whether a significant difference exists between codependency scores in terms of certain variables. CODAT total scores and each of its subscales scores were calculated with descriptive statistics such as percentage and arithmetic means. In this study, a *p*-value of less than .05 was considered statistically significant.

Ethical Consideration

Written permission was obtained from the university's School of Nursing and the Faculty of Engineering, Mechanical Engineering Department. Department heads were informed prior to the onset of study. Students were informed of the study's purpose and special emphasis was placed on the facts that participation was voluntary and the collected data collected would only be used for research purposes. A written informed consent form was signed by each participant.

Results

Codependency and Gender

Table 1 shows the students' total and subscales scores for CODAT. Students' CODAT total mean score is 51.89 ($SD = 9.93$; ranging from 32 to 93). The difference of codependency scores according to gender is presented Table 2. Of the nursing students, 89.4% ($n = 168$) are female, whereas 87.4% of the mechanical engineering students ($n = 83$) are male. Male students in this study had higher codependency scores compared to the female students, but the difference is not statistically significant. Female students had lower scores on the other focus/self-neglect subscale ($p < .05$), low self-worth ($p < .05$), and hiding self ($p < .001$) subscales than male students. Female students had higher scores on the medical problems subscale compared to females ($p < .01$).

Table 1
CODAT subscales and total scores (n = 283)

	$M \pm SD$	Range
Other focus/Self-neglect	10.99 ± 3.30	(5-23)
Low Self-worth	10.35 ± 3.74	(6-29)
Hiding Self	13.16 ± 3.60	(5-25)
Medical Problems	6.63 ± 2.44	(4-17)
Family of origin Issues	10.77 ± 2.57	(5-20)
Total CODAT	51.89 ± 9.93	(32-93)

Codependency and Health Education

The comparison of codependency to health education is shown in Table 2. No statistically significant difference in codependency levels between nursing and mechanical engineering students is evident ($p > .05$). However, mechanical engineering students were found to have statistically significantly higher scores than nursing students on the hiding-self subscale ($p < .01$). The nursing students had higher scores on the medical problems subscale ($p < .05$).

In this study, first-year students were found to have significantly higher codependency scores than fourth-year students ($p < .05$). First-year students had higher scores for the hiding self ($p < .001$) and medical problems ($p < .01$) subscales.

Codependency and Dysfunctional Family History, History and Treatment of Mental Illness, Alcohol/ Substances Abuse

Table 3 introduces the comparison of students' self-reported psychiatric characteristics and their codependency levels. Students who reported having good family relationships had lower scores for the low self-worth ($p < .01$), medical problems ($p < .05$), and family of origin issues ($p < .001$) subscales and the overall CODAT ($p < .01$).

In this study, students who were asked to report their mental illnesses reported suffering mostly from depression and mood disorders. The students who reported having a history of mental illness ($p < .001$) or who were receiving treatment for a mental illness ($p < .001$) were found to have higher CODAT scores. Students with a history of alcohol or substance abuse had higher scores on the other focus/self-neglect ($p < .05$) and hiding-self ($p < .01$) subscales, and for the overall CODAT ($p < .01$) compared to the others.

Discussion

The students who participated in this study were found to have mild codependency levels. Similarly, Bynum et al.'s (2012) study measured codependency using the CODAT, and the same scoring system demonstrated that 50% ($n = 134$) of social sciences students had low codependency levels and 48.1% ($n = 129$) had mild codependency levels. In Martsolf et al.'s (1999) codependency study on male and female professional assistants, the majority of professional assistants had low scores for the overall CODAT. On the other hand, Knudson and Terrel (2012) reported that 17.5% of 223 undergraduate students showed high levels of codependency by using the Span-Fischer Codependency Scale. This inconsistency in the results reported by different studies can be attributed to the result of a lack of research (lack of cultural adaptation) on the CODAT and other codependency scales in Turkish populations,

Table 2
Health Education and CODAT (n = 283)

	n (%)	other focus/Self-Neglect		Low Self-worth		Hiding Self		Medical Problems		Family of origin Issues		Total CODAT	
		M ± SD	t, p	M ± SD	t, p	M ± SD	t, p	M ± SD	t, p	M ± SD	t, p	M ± SD	t, p
Gender Female	180 (63.6)	10.62±2.86	-2.28, .024*	10.20±3.50	-.89, .037*	12.59±3.54	-3.57, .000***	6.93±2.47	-2.72, .007**	10.81±2.59	.34, .74	51.14±9.90	-1.68, .095
Male	103 (36.4)	11.62±3.88		10.61±4.14		14.15±3.52		6.12±2.33		10.70±2.54		53.19±9.90	
School Nursing	188 (66.4)	10.88±3.08	-.78, .44	10.29±3.48	-.36, .72	12.76±3.69	-2.62, .009**	6.84±2.38	2.02, .044*	10.87±2.61	.92, .36	51.64±10.02	-.60, .55
Mechanical Engineering	95 (33.6)	11.20±3.70		10.46±4.22		13.94±3.30		6.22±2.53		10.57±2.49		52.39±9.79	
Year 1st	153 (54.1)	10.92±3.37	-.39, .70	10.41±4.00	-.30, .76	14.07±3.79	4.91, .000***	7.03±2.73	3.108, .002**	10.77±2.57	.03, .98	53.20±10.44	2.43, .016*
4th	130 (45.9)	11.07±3.22		10.28±3.43		12.08±3.05		6.16±1.98		10.76±2.57		50.35±9.10	

* $p < .05$, ** $p < .01$, *** $p < .001$.

Table 3
Psychiatric Characteristics and CODAT

		N (%)	Other Focus/Self-Neglect		Low Self worth		Hiding Self		Medical Problems		Family of origin Issues		CODAT	
			M ± SD	t / Z, p	M ± SD	t / Z, p	M ± SD	t / Z, p	M ± SD	t / Z, p	M ± SD	t / Z, p	M±SD	t / Z, p
Family relationship	Good	214(75.6)	10.99±3.22	.04, .97	9.84±3.04	3.27, .002**	13.09±3.63	-0.51, .61	6.45±2.41	-2.24, .026*	10.38±2.25	-3.90, .000***	50.75±9.06	-3.05, .003**
	Fair-poor	69 (24.4)	10.97±3.55		11.94±5.07		13.35±3.55		7.20±2.49		11.96±3.09		55.42±11.63	
History of mental illness	Yes	16 (5.7)	12.44±3.37	-1.919, .055	12.88±4.66	-2.462, .014*	14.63±4.43	-1.208, .227	8.19±2.99	-2.316, .021*	13.13±3.01	-3.449, .001***	61.25±9.79	-3.709, .000***
	No	267(94.3)	10.90±3.28		10.20±3.63		13.07±3.54		6.54±2.38		10.63±2.48		51.33±9.67	
Treatment of mental illness	Yes	22 (7.8)	12.91±4.33	-2.266, .023*	11.95±5.35	1.213, .225	15.59±4.77	-2.440, .015*	7.55±2.76	-1.766, .077	12.91±3.35	-3.382, .001***	60.91±12.92	-3.678, .000***
	No	261(92.2)	10.82±3.15		10.21±3.55		12.95±3.42		6.56±2.41		10.59±2.41		51.13±9.28	
Alcohol/ substances abuse	Yes	8 (2.8)	13.50±3.74	-1.998, .046*	13.13±6.08	-1.699, .089	17.50±4.44	-2.839, .005**	7.50±2.51	-1.121, .262	11.88±2.47	-1.344, .179	63.50±10.27	-3.044, .002**
	No	275(97.2)	10.91±3.26		10.27±3.64		13.03±3.51		6.61±2.44		10.73±2.57		51.55±9.74	

* $p < .05$, ** $p < .01$, *** $p \leq .001$. Z- Mann-Whitney U.

as well as uncertainty regarding the cultural specific cut-off values in the scales. The low levels of codependency among undergraduate students enrolled in this study can be explained by the healthy personality characteristics and, accordingly, behavioral patterns displayed by the students in the social environment.

In this study, no statistically significant difference was found between codependency and gender. Similarly, Hawkins and Hawkins II's (2014) study on a sample of 208 American undergraduates revealed no difference in codependence measures based on gender. On the other hand, Altinova and Altuntas' (2015) study showed that women had moderate and higher levels of codependency in Turkey. Also Altinova and Altuntas' (2015) study on Turkish woman with lower-to-moderate socioeconomic levels observed them to generally lack very high self-respect and self-confidence. These higher levels of codependency are considered to be associated with the fact that traditional roles are assigned to women more than men in Turkish culture.

The lower scores for other focus/self-neglect and hiding-self subscales indicated in female students in this study are dissimilar with those reported by other studies (Ancel, 2012; Fuller & Warner 2000). A study by Martsolf et al. (1999) reported that male students had higher scores for the hiding-self subscale, which is similar to this study's results. Although codependency is well-accepted as a gender-related problem that affects mainly women, a literature review shows that men also experience symptoms of relationship-addiction, which is higher among those who provide care and feel responsible for others' emotions, actions, and thoughts (Martsolf et al., 1999; Snow, 1997).

Similar levels of codependency were noted between nursing and mechanical engineering students. This study finding resembles Belya's (2001) result, which showed that codependency scores were higher for those participants working in assistive professions compared to others, but the differences were not sufficiently significant. Also, Hopkins and Jackson (2002) showed that no significant relationship exists between co-dependency and university program (nursing and sociology). This study's findings contradict previous findings where being a healthcare worker affects codependency (Hughes-Hammer et al., 1998) and the literature that indicates being a health caregiver has an impact on codependency (Ancel & Kabakci, 2009). This study's reported results may relate to the fact that most of the mechanical engineering students were first-year students and that engineering education in Turkey offers not only vocational subjects but also courses including physics, math, chemistry, and linear algebra. However, mechanical engineering students were found to show higher scores for hiding-self compared to nursing students, which has been attributed to their tendency to select a field of study that requires no human-relations skills. We were unable to compare this finding with relevant

studies due to insufficient research in the literature comparing students who receive health education with those who do not.

One important finding from this study is that as the academic year progresses the levels of codependency (hiding-self subscale in particular) decrease. In this study, similar to the Hopkins and Jackson's (2002) study, fourth-year university students have significantly lower codependency scores than first-year university students. This result can relate to undergraduate students' becoming more socialized, particularly in their senior year, as well as their acquiring the ability to display their personality in social settings.

In this study, students with fair/poor family relationships had higher levels of codependency. Previous studies have shown that individuals with high levels of codependency report significantly more family-related issues, parental mental-health issues, problematic intimate relationships (especially when involving a chemically dependent friend), chronic physical illness in a close family member, and personal psychological problems including compulsiveness (Cullen & Carr 1999; Noriega et al. 2008; Self, 2010). Similarly, Knudson and Terrell (2012) also demonstrated the relationship between codependency in adulthood and perceived inter-parental conflict. Relevant literature indicates that a stressful environment prevents a child from developing a healthy personality, thus contributing to the development of codependency (Fuller & Warner, 2000). This finding suggests that students who report having fair/poor family relationships solicit emotional support from others, which manifests itself as codependent behavior.

In this study, participants with a history and treatment of mental illness had higher levels of codependency compared to those without. Also, the most common self-reported psychological problem was depression/mood disorders; this is supported by data from the literature, which indicate that the most prevalent psychological disorders associated with codependency are anxiety, depression, anger, and compulsiveness (Bynum et al., 2012; Snow, 1997). In a study investigating codependency and related health variables, Martsolf, Sedlak, and Doheny (2000) reported that codependency and perceived health correlate to functional ability and depression, a finding which is consistent with our results. Freydoni and Rezaei (2015) found that codependency is a significant predictor of depression among women.

A statistically significant relationship was noted between current or past substance/alcohol abuse and codependency. Consistent with our findings, one study (Self, 2010) investigating the relationship between substance-abuse disorders and codependency among nurses demonstrated that nurses who self-reported a history of treatment for substance abuse had significantly higher codependency scores that significantly differed from the scores of those who reported no treatment for substance abuse.

Conclusion

This study was unable to confirm a relationship between codependency and gender. Additionally, no relationship was found between codependency and the status of receiving health education. First-year students were found to have higher scores for hiding-self and for their codependency total scores. Codependency was also higher among students who reported a history of receiving treatment for mental illness, as well as for those who reported alcohol or substance abuse. Therefore, undergraduate students' codependency levels should be evaluated at regular intervals, and these students should be encouraged to improve their self-awareness regarding codependency and to establish healthy relationships. In addition, students who are deemed at risk for codependency, have family-related issues, and/or receive treatment for mental illness should be provided support through psychological counseling and guidance units and, if necessary, referred to a psychiatric clinic for assessment. First-year undergraduate students should be encouraged to participate in social activities including theater, sports, and so on to give them opportunities to express, rather than hide, themselves. In addition, these students who are to be future professionals in their fields of study should be encouraged to participate in personal enrichment programs and peer support groups in order to prevent them from abusing alcohol and drugs. Furthermore, comparative studies on members of professions other than health sciences should be conducted for further clarification of the effects on codependency of selecting and working in a healthcare-related profession. Further large-scale studies are warranted to clarify the nature of codependency and to identify and compare the prevalence of codependency in diverse samples.

Limitations

The present study reflects only the features of the sample that were studied; it cannot be generalized to all undergraduate students in Turkey. However, its importance remains because it compares the nature of codependency through two different samples and the factors that affect this nature.

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