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The effect of loneliness on depression: A meta-analysis

Evren Erzen[1] and Özkan Çikrikci[2]

Abstract

Background: Negative emotions, which have a common, chronic and recurrent structure, play a vital role in the development and maintenance of psychopathology. In this study, loneliness as a negative emotion was considered to be a predisposing factor in depression.

Aim: The aim of this meta-analysis is to determine the effect of loneliness on depression.

Method: Initially, a literature scan was performed and all related literature was pooled together ($n = 531$). Based on scales determined by the researchers, it was decided to include 88 studies in the analysis. This study obtained a sampling group of 40,068 individuals.

Results: The results of using a random effects model for analysis showed that loneliness had a moderately significant effect on depression. None of the variables of study sampling group, type of publication and publication year were found to be moderator variables.

Conclusion: According to the results of the research, loneliness may be said to be a significant variable affecting depression. The findings obtained are discussed in light of the literature.

Keywords

Loneliness, depression, meta-analysis

Introduction

Depression, which is distinguished by symptoms of low motivation, appetite or uncomfortable sleep, falling self-worth, feelings of guiltiness, falling of energy, dissatisfaction and lack of interest, is a mood disorder that takes hold of all society in the world. Nowadays, it is estimated that approximately 350 million people are affected by depression. Results of the World Mental Health Survey revealed that almost 1 in 20 people is exposed to depression episodes (World Health Organization (WHO), 2012). Given the etiology of depression, the effects of biological, psychological and social components have been shown. The effect of loneliness, which is accepted as one of the social determinants of depression (Cacioppo, Fowler, & Christakis, 2009), on depression was assessed in this study.

Loneliness is a universal and common situation with emotional, cognitive and motivational scales (Galanaki, 2004). Loneliness, contrary to human nature due to the disposition toward social communication and unity (Cacioppo & Patrick, 2008), is a negative situation occurring due to the insufficient quality and quantity of social relationship networks of an individual. Research related to loneliness has demonstrated the correlation of loneliness to factors such as lack of emotional support (Alkan, 2014; Stickley et al., 2015), stress (Burke & Segrin, 2014), entrapment (Perron, Cleverley, & Kidd, 2014), social deficiency (Zhang et al., 2014), low self-esteem (Świtaj, Grygiel, Anczewska, & Wciórka, 2015), hopelessness (Chang, Lian, et al., 2015), shyness (Clark, Loxton, & Tobin, 2015) and low levels of emotional intelligence (Wols, Scholte, & Qualter, 2015). However, among factors that are affected by loneliness, there is much research on the variable of depression (Çağan & Ünsal, 2014; Chang, Muyan, & Hirsch, 2015; Grov, Golub, Parsons, Brennan, & Karpiak, 2010; Holvast et al., 2015; Weiss, 1973; Yadegarfard, Ho, & Bahramabadian, 2013; Yao & Zhong, 2014).

As with loneliness, research related to depression has aimed to find the causes of depression and treatment aims to predict interventions to these variables. Many studies completed by researchers have revealed that loneliness is a

[1]Department of Primary Education, Faculty of Education, Artvin Coruh University, Artvin, Turkey
[2]Department of Educational Sciences, Faculty of Education, Ordu University, Ordu, Turkey

Corresponding author:
Özkan Çikrikci, Department of Educational Sciences, Faculty of Education, Ordu University, Ordu 52200, Turkey
Email: ozkanc61@hotmail.com

Table 1. Characteristics of studies included in the meta-analysis.

Options		1	2	3	4	
Publication year		Before 1990	1990–1999	2000–2009	After 2010	
	n	7	15	32	34	
	%	7.95	17.04	36.36	38.65	
Publication type		Thesis	Paper			
	n	31	57			
	%	35,22	64,73			
Sampling group		Patient	Career	Elderly	Student	Other
	n	10	8	23	35	12
	%	11.36	9.09	26.13	39.77	13.65

significant variable among causes of depression, with different results and values found by these studies (Drageset, Espehaug, & Kirkevold, 2012; Grov et al., 2010; Jaremka et al., 2013; Peerenboom, Collard, Naarding, & Comijs, 2015; Şahin & Tan, 2012). However, it appears there is no study on the total effect value of loneliness on depression. With this aim, this study attempts to determine the degree of effect of loneliness on depression from different values obtained by previous studies to identify the total effect value.

This study researched the effect of loneliness on depression. In addition, the following variables were considered to be moderators affecting the mean effect size obtained by the study: (1) sample used in the research, (2) type of publication of research and (3) year of publication of research. Together with these variables in light of previous research results, this study attempted to test the following hypotheses:

H_1. Loneliness has a positive effect on depression.

H_2. Sampling group is a moderator of the positive effect of loneliness on depression.

H_3. Type of publication is a moderator of the positive effect of loneliness on depression.

H_4. Publication year is a moderator of the positive effect of loneliness on depression.

Method

Study design

This study tested the effect of loneliness on depression using the method of meta-analysis. Meta-analysis combines the results of many independent studies on a certain topic and is a method of statistically analyzing the obtained research findings (Littel, Corcoran, & Pillai, 2008). The current meta-analysis follows the Preferred Reporting Items for Systematic Reviews and Meta-analyses guidelines (PRISMA) (Moher, Liberatti, Tetzlaff, & Altman, 2009).

Eligibility criteria and search strategy

To determine which research would be included in the meta-analysis, initially a literature scan of the Web of Knowledge and ProQuest academic databases was completed. In this stage, depression was taken as a basis and the term '*loneliness*' was used, and the title, keywords and abstracts were downloaded after the scanning procedure. The last date for research to be included in this study was determined to be January 2018.

The study used several strategies to determine which research was appropriate for inclusion in the meta-analysis. Initially, title, keywords and abstract were downloaded during scanning and a study pool of all research related to loneliness and depression (531 studies) was created. Later, the full text of publications was downloaded from the databases. According to the criteria below, 443 studies were excluded from the research after literature investigation. The descriptive statistics relating to the 88 studies are presented in Table 1.

The inclusion criteria determined for this study are as follows: (1) contains required statistical information for correlational meta-analysis (n and r or R^2 values), and (2) studies measuring the relationship between loneliness and depression. The exclusion criteria for studies in the meta-analysis are as follows: (1) no determination of any quantitative data, (2) no correlation values included in the research, (3) no acceptance of loneliness as a measured unit and (4) no access to the data through lack of access to the full text.

Coding is the term used for the procedure of extracting data, understanding confusing data in the studies and adapting it for use. Before proceeding to statistical analysis, a coding form was created in this study and coding was completed in accordance with this form. Our basic aim in creating this form was to develop a special coding system that would generally allow a view of all research and yet not allow the characteristics of a single research to be skipped. The coding form created for this study comprised the following components: (1) source of the research, (2) sampling information, (3) data collection method(s) and (4) methodological information, quantitative values.

Statistical procedure

The effect size obtained from meta-analysis is a standard scale value used to determine the strength and direction of the relationship in the study (Borenstein, Hedges, Higgins, & Rothstein, 2009). The effect size in this study was calculated as the Pearson correlation coefficient (r). As the correlation coefficient is a value between +1 and –1, this r value can be transformed into a value on z tables and used for calculations (Hedges & Olkin, 1985). As correlational meta-analysis studies provide more than one correlation value for the same structural category, there are two different approaches which can be used for meta-analysis (Borenstein et al., 2009; Kulinskaya, Morgenthaler, & Staudte, 2008). In this study, (1) initially if the correlations were independent, all related correlations were analyzed and accepted as independent studies, or (2) where dependent correlations are given, the mean of the correlations is used. Although there are different methods to correct the mean correlations, the majority of these methods cause high correlation estimates (Schyns & Schilling, 2013). As a result of this criticism, to use mean correlations all correlations are created from a conservative estimate, so this study used conservative estimates.

There are two basic models for meta-analysis studies: *fixed effects model* and *random effects model*. While deciding which model to use, the characteristics of studies included in the meta-analysis are examined to determine which model preconditions they abide by (Borenstein et al., 2009; Hedges & Olkin, 1985; Kulinskaya et al., 2008). For the *fixed effects model*, there is (1) an assumption that the research is functionally identical and (2) includes the aim of calculating the effect size only for the defined population. If the research is not believed to be functionally equivalent and if the calculated effect size is intended to be generalized to a larger population, the model that should be used is the *random effects model*. When these conditions were assessed, the meta-analysis procedure in this study used the *random effects model.* The meta-analysis procedure benefited from the *Comprehensive Meta-Analysis* program.

Moderator variables

Moderator analysis is an analysis method allowing testing of the difference in mean effect size of variables (moderators) and direction of difference between subgroups. Moderator analysis in a meta-analysis study should be planned appropriately with the aim of the study and should be performed in accordance with this plan (Littel et al., 2008). Statistical significance of differences between moderator variables is tested with the Q statistical method developed by Hedges and Olkin (1985). In this method, Q is divided into two as $Q_{between}$ (Q_b) and Q_{within} (Q_w) and analyses are performed on these two different Q. Q_w tests the homogeneity within the moderator variable used, while Q_b tests the homogeneity between the groups (Borenstein et al., 2009; Hedges and Olkin, 1985; Kulinskaya et al., 2008).

In this study, only the statistical significance of differences between moderators was examined, so only Q_b values were used. Four moderator variables considered to play a role in the mean effect size in this study were determined. One of these was the sample the research was completed with. Considering that the sampling group used for depression and loneliness may have affected the effect size, it was evaluated as a possible moderator. Second, possible differences between the effect of loneliness on depression in Turkey and other countries were considered and source of publication was determined as a moderator. Third, due to reporting of positive and negative data and inclusion of results with different aspects, the type of publication was considered a moderator. Finally, the year of publication of the research was concluded to be a possible moderator due to changing working conditions through the years and the resulting effects on depression.

Publication bias

The basis of publication bias is the assumption that all research on a topic may not have been published. Especially research that does not identify statistically significant correlations or find low-level correlations is not considered valuable for publication, affecting total effect levels negatively and increasing bias of mean effect size (Borenstein et al., 2009; Hanrahan, Field, Jones, & Davey, 2013; Kulinskaya et al., 2008). The effect of this publication bias, which we can call data loss, is that it negatively affects the total effect in meta-analysis studies. In this case, the possibility of publication bias should be considered in meta-analysis studies. To investigate publication bias in this study, the following questions were answered: (1) Is there any evidence of any publication bias? (2) Can general effect size be a result of publication bias? (3) What amount of the total effect can be linked to publication bias?

A range of calculation methods are used to provide a statistical answer to the questions related to the above possibilities in meta-analysis. The first of these is the *funnel plot* method. The shape provided by this method may not be fully objective but allows us to observe whether there is an effect of publication bias in the studies. The funnel plot of all research included in the meta-analysis in this study is presented in Figure 1. There is no evidence in Figure 1 of any effect linked to publication bias in the studies included in the meta-analysis. With publication bias, the funnel plot is expected to be severely asymmetric. The clustering of research plotted in lower parts of the funnel, especially on one side of the line showing mean effect size (especially the right side), shows the possibility of publication bias. In 74 studies included in the meta-analysis in this study, no evidence of publication bias was observed.

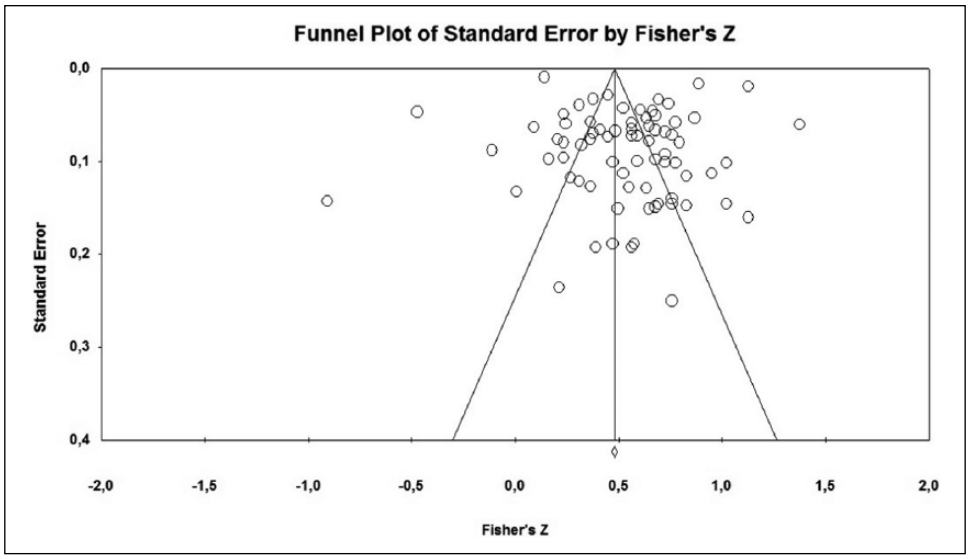

Figure 1. Funnel plot of effect size related to publication bias.

Table 2. Results of Duval–Tweedie's trim and fill test.

	Studies removed	Point estimate	95% CI		Q
			Lower	Upper	
Observed values		0.5008	0.4428	0.5546	4,618.54
Corrected values	22	0.4191	0.3561	0.4784	7,216.32

CI: confidence interval.

Table 3. Effect of loneliness on depression.

Variable	*k*	*r*	95% CI		*Q*	Q_b
			Lower	Upper		
Depression	88	.50**	.44	.55	4,618.54**	
Moderator (sampling group)						1.20
Patient	10	.54**	.38	.67		
Carer	8	.57**	.40	.70		
Elderly	23	.49**	.39	.59		
Student	35	.50**	.41	.58		
Other	12	.44**	.16	.66		
Moderator (publication type)						0.20
Paper	57	.52**	.45	.58		
Thesis	31	.49**	.41	.49		
Moderator (publication year)						4.31
Before 1990	7	.36**	.16	.53		
1990–1999	15	.52**	.40	.61		
2000–2009	32	.50**	.42	.57		
After 2010	34	.56**	.46	.65		

CI: confidence interval.
*$p < .05$; **$p < .01$.

Although no evidence relating to publication bias was observed on the funnel plot, there was publication bias observed in the *Duval–Tweedie's trim* and *fill tests* used to evaluate the amount of effect linked to publication bias in the effect size obtained from the meta-analysis. As a result, 18 studies were removed from the analysis. As observed in Table 2, there is a difference between the observed effect size value and the virtual effect size created to correct the effect due to publication bias.

Results

The meta-analysis results for depression and loneliness are found in Table 3. The findings show a positive relationship between depression and loneliness, supporting H_1. The effect value of loneliness on depression was significant ($r = .50$, $p < .01$; 95% BCa = [.44, .55]). This value shows that loneliness has a *moderate* (see Cohen, 1988) effect on depression.

Moderator analysis did not support H_2 that the sample used in the research played a moderator role in the effect levels of loneliness on depression. However, the research included in the meta-analysis of patients ($r = .54$, $p < .01$; 95% BCa = [.38, .67]), carers ($r = .57$, $p < .01$; 95% BCa = [.40, .70]), elderly ($r = .49$, $p < .01$; 95% BCa = [.39, .59]), students ($r = .50$, $p < .01$; 95% BCa = [.41, .58]) and other participants ($r = .44$, $p < .01$; 95% BCa = [.16, .66]) showed that loneliness had a moderate and significant effect on depression. The strongest effect belonged to the sample of carers. Although the effect values of different samples on depression change, the moderator analysis according to the random effects model found that the effect difference of sampling type used to measure depression was not statistically significant ($Q_b = 1.20$, $p > .05$).

Findings did not support H_3 that type of publication played a moderating role in the effect of loneliness on depression. In moderator analysis, the difference in effect levels between theses and papers was not found to be

statistically significant (Q_b=0.20, p>.05); however, a moderately significant effect was identified in papers (r=.52, p<.01; 95% BCa=[.45, .58]) and theses (r=.49, p<.01; 95% BCa=[.41, .49]).

The research did not support H_4 that publication year played a moderator role in the effect of loneliness on depression. The moderator analysis performed found that the difference in effect between publication years was not statistically significant (Q_b=4.31, p>.05). In this meta-analysis, research published in 2010 and after (r=.56, p<.01; 95% BCa=[.16, .53]), research published between 2000 and 2009 (r=.50, p<.01; 95% BCa=[.40, .61]), research published between 1990 and 1999 (r=.52, p<.01; 95% BCa=[.42, .57]) and research published before 1990 (r=.36, p<.01; 95% BCa=[.46, .65]) found a small level of effect of loneliness on depression.

Discussion

This study performed meta-analysis to determine what level of effect loneliness has on depression. Thus, general results can be obtained from papers and theses from the past to the present. In addition, the study examined whether the variables of sampling group, source of publication, publication year and type of publication played a moderator role in the effect of loneliness on depression.

The findings show that loneliness has a significant effect at moderate levels on depression. If analyzed for moderator variables, the variables determined in this study did not indicate a moderator effect on loneliness affecting depression. The findings of the sampling group analysis showed that lonely carers had greater depressive tendencies. Similar results were identified for patients, students, elderly and other victims of depression. This result shows that society leaves patients, carers and elderly alone with their problems and they distance from daily life, experiencing depression. In addition, problems experienced in the period of puberty leads teenagers who believe that no one understands them to experience feelings of loneliness which may cause depression. The need to feel a sense of belonging may be seen as the common characteristic between these two groups with very different age profiles and social environments. One of the variables used to explain the effect of loneliness on depression by research is feeling a sense of belonging (Baskin, Wampold, Quintana, & Enright, 2010). Research shows that belonging alone is effective on loneliness (Waytz, Chou, Magee, & Galinsky, 2015) and that individuals entering a new environment experience great difficulties in the period when they have not formed a social environment (Wohn & LaRose, 2014), leading to the consideration that loneliness in social environments may indirectly trigger depression. Social sufficiency (Zhang et al., 2014) may be a factor affecting the individual in youth and old age and may cause this result. Individuals in puberty are in a situation where their expertise is incomplete in social terms. In elderly people, these skills begin to be lost. In both situations, a distancing of the individual from social environments is the issue. This rupture means the individual loses the power to affect their environment. The tendency of individuals losing power to experience loneliness (Waytz et al., 2015) and the formation of a factor that reduces loneliness in their communication with their environment (Zhang, Gao, Fokkema, Alterman, & Liu, 2015) appear to be factors explaining the moderator role of the age factor.

Moderator analysis according to type of publication showed that type of publication did not have a significant effect on loneliness affecting depression. Both theses and papers had significant effect values, indicating there were significant differences within data from both theses and papers of the effect of loneliness on depression. This situation may be interpreted as results providing the possibility of differences in the effect of loneliness on depression in both theses and papers. This result showed that the relationship between depression and loneliness is a constant result and may be interpreted as not being affected by publication bias.

Finally, there did not appear to be a significant difference due to the moderator of publication year. Contrarily, all years had moderate level and significant effects. This result shows that the effect of loneliness on depression does not change from year to year; in other words, the effect of loneliness is shown to be a permanent factor in depression.

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ORCID iD

Özkan Çikrikci https://orcid.org/0000-0002-9789-5888

References

References marked with an asterisk indicate studies included in the meta-analysis.

*Adams, K. B., Sanders, S., & Auth, E. A. (2004). Loneliness and depression in independent living retirement communities: Risk and resilience factors. *Aging & Mental Health*, *8*, 475–485.

*Addams, A. M. (2011). *Depression and loneliness among the soviet elderly immigrants residing in subsidized housing in Chicago* (Unpublished doctoral dissertation). The Adler School of Professional Psychology, Chicago, IL.

Alkan, N. (2014). Humor, loneliness and acceptance: Predictors of university drop-out intentions. *Procedia – Social and Behavioral Sciences*, *152*, 1079–1086.

*Allen, O. B. (1994). *Loneliness, functional status, learned helplessness, and depression in rural older adults* (Unpublished doctoral dissertation). Louisiana State University, Baton Rouge, LA.

*Alpass, F. M., & Neville, S. (2003). Loneliness, health and depression in older males. *Aging & Mental Health*, *7*, 212–216.

*Anderson, C. A., & Arnoult, L. H. (1985). Attributional style and everyday problems in living: Depression, loneliness, and shyness. *Social Cognition*, *3*(1), 16–35.

*Anderson, C. A., & Harvey, R. J. (1988). Brief report: Discriminating between problems in living: An examination of measures of depression, loneliness, shyness, and social anxiety. *Journal of Social and Clinical Psychology*, *6*, 482–491.

*Ara, E. M., Talepasand, S., & Rezaei, A. M. (2017). A structural model of depression based on interpersonal relationships: The mediating role of coping strategies and loneliness. *Archives of Neuropsychiatry*, *54*, 125–130.

*Arslantaş, H. (2011). Yalnızlık, depresyon, sosyal destek ve etki eden faktörler. *Turkish Journal of Geriatrics*, *14*, 135–144.

*Asnani, M. R., Fraser, R., Lewis, N. A., & Reid, M. E. (2010). Depression and loneliness in Jamaicans with sickle cell disease. *BMC Psychiatry*, *10*, 1–7.

*Asti, T., Kara, M., Ipek, G., & Erci, B. (2006). The experiences of loneliness, depression, and social support of Turkish patients with continuous ambulatory peritoneal dialysis and their caregivers. *Journal of Clinical Nursing*, *15*, 490–497.

*Aylaz, R., Aktürk, Ü., Erci, B., Öztürk, H., & Aslan, H. (2012). Relationship between depression and loneliness in elderly and examination of influential factors. *Archives of Gerontology and Geriatrics*, *55*, 548–554.

*Azam, W. M., Yunus, W. M., Din, N. C., Ahmad, M., Ghazali, S. E., Ibrahim, N., ... Maniam, T. (2013). Loneliness and depression among the elderly in an agricultural settlement: Mediating effects of social support. *Asia-pacific Psychiatry*, *5*(S1), 134–139.

Baskin, T. W., Wampold, B. E., Quintana, S. M., & Enright, R. D. (2010). Belongingness as a protective factor against loneliness and potential depression in a multicultural middle school. *The Counseling Psychologist*, *38*, 626–651.

*Bedard, M., Woods, R., Crump, C., & Anisman, H. (2017). Loneliness in relation to depression: The moderating influence of a polymorphism of the brain derived neurotrophic factor gene on self-efficacy and coping strategies. *Frontiers in Psychology*, *8*, 1–10.

*Beeson, R. A. (2001). *Loneliness and depression in spousal caregivers of persons with Alzheimer's disease (AD) or related disorders* (Unpublished doctoral dissertation). Rush University, Chicago, IL.

*Beeson, R. A. (2003). Loneliness and depression in spousal caregivers of those with Alzheimer's disease versus non-caregiving spouses. *Archives of Psychiatric Nursing*, *17*, 135–143.

*Bergman, B. F. (1992). *Loneliness, depression, and social support among caregivers of spouses with Alzheimer's disease: The home versus the nursing home care experience* (Unpublished doctoral dissertation). The University of Nebraska Medical Center, Omaha.

Borenstein, M., Hedges, L. V., Higgins, J. P. T., & Rothstein, H. R. (2009). *Introduction to meta-analysis*. Chichester: Wiley.

*Brackin, L. A. (2001). *Loneliness, depression, social support, marital satisfaction and spirituality as experienced by the southern Baptist clergy wife* (Unpublished doctoral dissertation). The University of Arizona, Tucson.

Burke, T. J., & Segrin, C. (2014). Bonded or stuck? Effects of personal and constraint commitment on loneliness and stress. *Personality and Individual Differences*, *64*, 101–106.

Cacioppo, J. T., Fowler, J. H., & Christakis, N. A. (2009). Alone in the crowd: The structure and spread of loneliness in a large social network. *Journal of Personality and Social Psychology*, *97*, 977–991.

Cacioppo, J. T., & Patrick, W. (2008). *Loneliness: Human nature and the need for social connection*. New York: W.W. Norton & Company.

Çağan, Ö., & Ünsal, A. (2014). Depression and loneliness in disabled adults. *Procedia – Social and Behavioral Sciences*, *114*, 754–760.

*Ceyhan, E., & Ceyhan, A. A. (2011). Loneliness and depression levels of students using a university counseling center. *Education and Science, 36*(160), 81–92.

*Chang, E. C. (2018). Relationship between loneliness and symptoms of anxiety and depression in African American men and women: Evidence for gender as a moderator. *Personality and Individual Differences*, *120*, 138–143.

Chang, E. C., Lian, X., Yu, T., Qu, J., Zhang, B., Jia, W., ... Hirsch, J. K. (2015). Loneliness under assault: Understanding the impact of sexual assault on the relation between loneliness and suicidal risk in college students. *Personality and Individual Differences*, *72*, 155–159.

Chang, E. C., Muyan, M., & Hirsch, J. K. (2015). Loneliness, positive life events, and psychological maladjustment: When good things happen, even lonely people feel better! *Personality and Individual Differences*, *86*, 150–155.

*Chipala, M. L. (2008). *Longitudinal study of loneliness and depression as predictors of health in mid to later life* (Unpublished master's thesis). University of North Texas, Denton.

Clark, D. M. T., Loxton, N. J., & Tobin, S. J. (2015). Multiple mediators of reward and punishment sensitivity on loneliness. *Personality and Individual Differences*, *72*, 101–106.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Mahwah, NJ: Lawrence Erlbaum.

*Crothers, M. (2000). *The effects of mutuality patterns on depression, loneliness, shame, silencing-the-self, relationship satisfaction, and attitudes towards counseling* (Unpublished doctoral dissertation). University of Nebraska, Lincoln.

*Doane, L. D. (2008). *Loneliness, stress, and depression over the transition to adulthood: Interpersonal and physiological pathways* (Unpublished doctoral dissertation). Northwestern University, Evanston, IL.

Drageset, J., Espehaug, B., & Kirkevold, M. (2012). The impact of depression and sense of coherence on emotional and social loneliness among nursing home residents without cognitive impairment – A questionnaire survey. *Journal of Clinical Nursing*, *21*, 965–974.

*Dupuis, C. L. (2003). *Depression, loneliness and perception of support in individuals with a mild intellectual disability*

(Unpublished doctoral dissertation). University of Calgary, AB.

*Finkelstein, R. J. (1995). *Depression and loneliness in the early adolescent, learning-disabled population* (Unpublished doctoral dissertation). Hofstra University, Hempstead, NY.

Galanaki, E. (2004). Teachers and loneliness: The children's perspective. *School Psychology International*, *25*, 92–105.

*Gaudin, J. M., Jr., Polansky, N. A., Kilpatrick, A. C., & Shilton, P. (1993). Loneliness, depression, stress, and social supports in neglectful families. *American Journal of Orthopsychiatry*, *63*, 597–605.

*Graf, A. H. (2002). *Loneliness, depression and nutritional status among low income women* (Unpublished master's thesis). University of Alberta, Edmonton.

Grov, C., Golub, S. A., Parsons, J. T., Brennan, M., & Karpiak, S. E. (2010). Loneliness and HIV-related stigma explain depression among older HIV-positive adults. *AIDS Care*, *22*, 630–639.

*Hagerty, B. M., & Williams, A. (1999). The effects of sense of belonging, social support, conflict, and loneliness on depression. *Nursing Research*, *48*, 215–219.

Hanrahan, F., Field, A. P., Jones, F. W., & Davey, G. C. (2013). A meta-analysis of cognitive therapy for worry in generalized anxiety disorder. *Clinical Psychology Review*, *33*, 120–132.

Hedges, L., & Olkin, I. (1985). *Statistical models for meta-analysis*. New York, NY: Academic Press.

*Heiman, T., & Margalit, M. (1998). Loneliness, depression, and social skills among students with mild mental retardation in different educational settings. *The Journal of Special Education*, *32*, 154–163.

*Hemann, K. S. (2005). *The influence of social self-efficacy, self-esteem, and personality differences on loneliness and depression* (Unpublished doctoral dissertation). The Ohio State University, Columbus.

Holvast, F., Burger, H., de Waal, M. M., van Marwijk, H. W., Comijs, H. C., & Verhaak, P. F. (2015). Loneliness is associated with poor prognosis in late-life depression: Longitudinal analysis of the Netherlands study of depression in older persons. *Journal of Affective Disorders*, *185*, 1–7.

*Hudson, D. B., Elek, S. M., & Campbell-Grossman, C. (2000). Depression, self-esteem, loneliness, and social support among adolescent mothers participating in the new parents project. *Adolescence*, *35*, 445–453.

Jaremka, L. M., Fagundes, C. P., Glaser, R., Bennett, J. M., Malarkey, W. B., & Kiecolt-Glaser, J. K. (2013). Loneliness predicts pain, depression, and fatigue: Understanding the role of immune dysregulation. *Psychoneuroendocrinology*, *38*, 1310–1317.

*Jaya, E. S., Hillmann, T. E., Reininger, K. M., Gollwitzer, A., & Lincoln, T. M. (2017). Loneliness and psychotic symptoms: The mediating role of depression. *Cognitive Therapy and Research*, *41*, 106–116.

*Johnson, R. A. (1984). *Loneliness among hospitalized alcohol abusers: Exploration and treatment* (Unpublished master's thesis). Oklahoma State University, Stillwater.

*Kara, M., & Mirici, A. (2004). Loneliness, depression, and social support of Turkish patients with chronic obstructive pulmonary disease and their spouses. *Journal of Nursing Scholarship*, *36*, 331–336.

*Karn, M. A. (2003). *The peer acceptance, social self-concept, feelings of loneliness, and feelings of depression of learning disabled and nondisabled students in rural schools* (Unpublished doctoral dissertation). Alfred University, NY.

*Kılıç, S. P., Karadağ, G., Koçak, H. S., & Korhan, E. A. (2014). Investigation of the old age perceptions with the loneliness and depression levels of the elderly living at home. *Turkish Journal of Geriatrics/Türk Geriatri Dergisi*, *17*(1), 70–76.

*Kim, E., Kim, E. J., & Cho, C. I. (2017). Structural equation model of smartphone addiction based on adult attachment theory: Mediating effects of loneliness and depression. *Asian Nursing Research*, *11*, 92–97.

*Kim, O., Byeon, Y. S., Kim, J. H., Endo, E., Akahoshi, M., & Ogasawara, H. (2009). Loneliness, depression and health status of the institutionalized elderly in Korea and Japan. *Asian Nursing Research*, *3*(2), 63–70.

Kulinskaya, E., Morgenthaler, S., & Staudte, R. G. (2008). *Meta analysis: A guide to calibrating and combining statistical evidence*. Hoboken, NJ: John Wiley & Sons.

*Lam, L. M. C., Yu, J., & Lee, T. M. (2017). Perceived loneliness and general cognitive status in community-dwelling older adults: The moderating influence of depression. *Aging, Neuropsychology, and Cognition*, *24*, 471–480.

*Lau, S., Chan, D. W., & Lau, P. S. (1999). Facets of loneliness and depression among Chinese children and adolescents. *The Journal of Social Psychology*, *139*, 713–729.

Littel, H. J., Corcoran, J., & Pillai, V. (2008). *Systematic reviews and meta-analysis*. New York, NY: Oxford University Press.

*Liu, L., Gou, Z., & Zuo, J. (2016). Social support mediates loneliness and depression in elderly people. *Journal of Health Psychology*, *21*, 750–758.

*Martin, K. M. (1995). *Attachment style, depression and loneliness in adolescent suicide attempters* (Unpublished doctoral dissertation). The American University, Washington, DC.

*Matthews, T., Danese, A., Wertz, J., Odgers, C. L., Ambler, A., Moffitt, T. E., & Arseneault, L. (2016). Social isolation, loneliness and depression in young adulthood: A behavioural genetic analysis. *Social Psychiatry and Psychiatric Epidemiology*, *51*, 339–348.

*Mezuk, B., Choi, M., DeSantis, A. S., Rapp, S. R., Roux, A. V. D., & Seeman, T. (2016). Loneliness, depression, and inflammation: Evidence from the multi-ethnic study of atherosclerosis. *PLoS One*, *11*, e0158056.

Moher, D., Liberatti, A., Tetzlaff, J., & Altman, D. G. (2009). Preferred reporting Items for systematic reviews and meta-analyses: The PRISMA statement. *PLoS Medicine*, *6*(7), e1000097.

*Nangle, D. W., Erdley, C. A., Newman, J. E., Mason, C. A., & Carpenter, E. M. (2003). Popularity, friendship quantity, and friendship quality: Interactive influences on children's loneliness and depression. *Journal of Clinical Child and Adolescent Psychology*, *32*, 546–555.

*Nyre, J. E. (1999). *Construct independence of loneliness and depression in prepubertal youth: The impact of development and gender on prevalence and severity* (Unpublished doctoral dissertation). The University of Kansas, Lawrence.

*Omar, M. (2005). *Examining the relationship between recreation participation and quality of life among residents*

of a long-term care facility: Counteracting loneliness, depression, and boredom (Unpublished master's thesis). University of Manitoba, Winnipeg.

*Oni, O. O. (2010). *Social support, loneliness and depression in the elderly* (Unpublished master's thesis). Queens's University, Kingston, Ontario, Canada.

*Ostovar, S., Allahyar, N., Aminpoor, H., Moafian, F., Nor, M. B. M., & Griffiths, M. D. (2016). Internet addiction and its psychosocial risks (depression, anxiety, stress and loneliness) among Iranian adolescents and young adults: A structural equation model in a cross-sectional study. *International Journal of Mental Health and Addiction*, *14*, 257–267.

*Özdemir, Y., Kuzucu, Y., & Ak, Ş. (2014). Depression, loneliness and Internet addiction: How important is low self-control? *Computers in Human Behavior*, *34*, 284–290.

*Patched, E. (2005). *Negative mood regulation expectancies and residence location as predictors of college students' adaptation to college, depression and loneliness* (Unpublished master's thesis). California State University, Long Beach.

Peerenboom, L., Collard, R. M., Naarding, P., & Comijs, H. C. (2015). The association between depression and emotional and social loneliness in older persons and the influence of social support, cognitive functioning and personality: A cross-sectional study. *Journal of Affective Disorders*, *182*, 26–31.

*Perloff, R. M., Quarles, R. C., & Drutz, M. (1983). Loneliness, depression and the uses of television. *Journalism & Mass Communication Quarterly*, *60*, 352–356.

Perron, J. L., Cleverley, K., & Kidd, S. A. (2014). Resilience, loneliness, and psychological distress among homeless youth. *Archives of Psychiatric Nursing*, *28*, 226–229.

*Peters, H. O. (2012). *Social connections: Internet prevention of loneliness and depression in first year university students* (Unpublished doctoral dissertation). Palo Alto University, CA.

*Purwono, U., & French, D. C. (2016). Depression and its relation to loneliness and religiosity in Indonesian Muslim adolescents. *Mental Health, Religion & Culture*, *19*, 218–228.

*Reed, M. E. (1986). *The mascot model of human/companion animal interaction: Its effects on levels of loneliness and depression among residents of a nursing home* (Unpublished doctoral dissertation). Western Seminary, Portland, OR.

Şahin, Z. A., & Tan, M. (2012). Loneliness, depression, and social support of patients with cancer and their caregivers. *Clinical Journal of Oncology Nursing*, *16*, 145–149.

*Sayied, N. E., Mohamed, H. S., & Thabet, R. A. E.A. (2012). Feeling of Depression and loneliness among Elderly people Attending Geriatric Clubs at Assiut City. *Life Science Journal*, *9*, 140–145.

Schyns, B., & Schilling, J. (2013). How bad are the effects of bad leaders? A meta-analysis of destructive leadership and its outcomes. *The Leadership Quarterly*, *24*, 138–158.

*Segrin, C., Powell, H. L., Givertz, M., & Brackin, A. (2003). Symptoms of depression, relational quality, and loneliness in dating relationships. *Personal Relationships*, *10*(1), 25–36.

*Smith, L. J. (2010). *The effect of training in internet use on perceived loneliness, depression and well-being with the African American elderly* (Unpublished doctoral dissertation). Capella University, Minneapolis, MN.

*Spier, B. E. (1989). *Relationships between depression, self-esteem, and loneliness in elderly community residents* (Unpublished doctoral dissertation). University of Pittsburgh, PA.

*Spithoven, A. W., Lodder, G. M., Goossens, L., Bijttebier, P., Bastin, M., Verhagen, M., & Scholte, R. H. (2017). Adolescents' loneliness and depression associated with friendship experiences and well-being: A person-centered approach. *Journal of Youth and Adolescence*, *46*, 429–441.

Stickley, A., Koyanagi, A., Leinsalu, M., Ferlander, S., Sabawoon, W., & McKee, M. (2015). Loneliness and health in Eastern Europe: Findings from Moscow, Russia. *Public Health*, *129*, 403–410.

*Swami, V., Chamorro-Premuzic, T., Sinniah, D., Maniam, T., Kannan, K., Stanistreet, D., & Furnham, A. (2007). General health mediates the relationship between loneliness, life satisfaction and depression. *Social Psychiatry and Psychiatric Epidemiology*, *42*, 161–166.

Świtaj, P., Grygiel, P., Anczewska, M., & Wciórka, J. (2015). Experiences of discrimination and the feelings of loneliness in people with psychotic disorders: The mediating effects of self-esteem and support seeking. *Comprehensive Psychiatry*, *59*, 73–79.

*Taggard, L. A. P. (1996). *Relationships among affiliation with companion animals, attachment style, depression, loneliness, satisfaction with life, and self-esteem: Implications for human candidate selection for adjunctive use of companion animals* (Unpublished doctoral dissertation). University of Tennessee, Knoxville, TN.

*Tsai, S. J., Yeh, H. L., Hong, C. J., Liou, Y. J., Yang, A. C., Liu, M. E., & Hwang, J. P. (2012). Association of CHRNA4 polymorphism with depression and loneliness in elderly males. *Genes, Brain and Behavior*, *11*, 230–234.

*Varghese, M. E., & Pistole, M. C. (2017). College student cyberbullying: Self-esteem, depression, loneliness, and attachment. *Journal of College Counseling*, *20*, 7–21.

*Viragh, G. (2005). *Elder loneliness, social support and depression* (Unpublished master's thesis). McGill University, Montreal, Quebec, Canada.

*Wang, K. T., Yuen, M., & Slaney, R. B. (2009). Perfectionism, depression, loneliness, and life satisfaction a study of high school students in Hong Kong. *The Counseling Psychologist*, *37*, 249–274.

Waytz, A., Chou, E. Y., Magee, J. C., & Galinsky, A. D. (2015). Not so lonely at the top: The relationship between power and loneliness. *Organizational Behavior and Human Decision Processes*, *130*, 69–78.

*Weeks, D. G., Michela, J. L., Peplau, L. A., & Bragg, M. E. (1980). Relation between loneliness and depression: A structural equation analysis. *Journal of Personality and Social Psychology*, *39*, 1238–1244.

*Wei, M., Russell, D. W., & Zakalik, R. A. (2005). Adult attachment, social self-efficacy, self-disclosure, loneliness, and subsequent depression for freshman college students: A longitudinal study. *Journal of Counseling Psychology*, *52*, 602–614.

*Wei, M., Shaffer, P. A., Young, S. K., & Zakalik, R. A. (2005). Adult attachment, shame, depression, and loneliness: The mediation role of basic psychological needs satisfaction. *Journal of Counseling Psychology*, *52*, 591–601.

Weiss, R. S. (1973). *Loneliness: The experience of emotional and social isolation*. Cambridge, MA: MIT Press.

Wohn, D. Y., & LaRose, R. (2014). Effects of loneliness and differential usage of Facebook on college adjustment of first-year students. *Computers & Education*, *76*, 158–167.

Wols, A., Scholte, R. H. J., & Qualter, P. (2015). Prospective associations between loneliness and emotional intelligence. *Journal of Adolescence*, *39*, 40–48.

World Health Organization. (2012). Depression. Retrieved from http://www.who.int/mediacentre/factsheets/fs369/en

*Wright, K. B., King, S., & Rosenberg, J. (2014). Functions of social support and self-verification in association with loneliness, depression, and stress. *Journal of Health Communication*, *19*(1), 82–99.

Yadegarfard, M., Ho, R., & Bahramabadian, F. (2013). Influences on loneliness, depression, sexual-risk behaviour and suicidal ideation among Thai transgender youth. *Culture, Health & Sexuality*, *15*, 726–737.

Yao, M. Z., & Zhong, Z. J. (2014). Loneliness, social contacts and Internet addiction: A cross-lagged panel study. *Computers in Human Behavior*, *30*, 164–170.

*Yeung, A. W. (2009). *The perception of friendships for children with Asperger's disorder and its relationship with loneliness and depression* (Unpublished doctoral dissertation). University of Hartford, West Hartford, CT.

*Yilmaz, A., & Dedeli, O. (2016). Assessment of anxiety, depression, loneliness and stigmatization in patients with tuberculosis. *Acta Paulista de Enfermagem*, *29*, 549–557.

Zhang, B., Gao, Q., Fokkema, M., Alterman, V., & Liu, Q. (2015). Adolescent interpersonal relationships, social support and loneliness in high schools: Mediation effect and gender differences. *Social Science Research*, *53*, 104–117.

Zhang, F., You, Z., Fan, C., Gao, C., Cohen, R., Hsueh, Y., & Zhou, Z. (2014). Friendship quality, social preference, proximity prestige, and self-perceived social competence: Interactive influences on children's loneliness. *Journal of School Psychology*, *52*, 511–526.