The influence of Self-talk on Depression and Self-Esteem scores in Undergraduate Students.

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Submission of Thesis and Dissertation

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Abstract

As a result of increased emphasis being placed on the alarmingly ubiquitous mental-health-related diagnoses in Irish third-level institutions, the current study aimed to provide useful aids to the population (Undergraduate Students) to negate negative health outcomes. This was achieved by investigating the influence of negative self-talk on depressive symptomology and ones' self-esteem. Twenty-six participants took part in a 2-week self-intervention, while twenty-one participants were placed in a control group. The Mixed 2x2 factorial design of the study employed a within-participant repeated measure of time (Baseline and Post) against groups (Intervention and Control) to measure the interaction effect on the dependent variables of depression, and self-esteem scores. While time significantly improved the outcome of both dependent variables, the intervention itself did not. Pearson's correlations tests showed that higher engagements of self-talk categorised as Self-Criticism, Self-Management and Social Assessment were all associated with higher levels of depressive symptomology, and lower levels of Self-Esteem, while engagements in Self-Reinforcement were associated with the inverse. These findings highlight the salience of the impact negative interactions with ourselves have on our mental wellbeing. Future research should continue to develop materials in aiding individuals to engage in cognitive restructuring techniques to reduce engagements of self-criticism, as well as to pilot self-talk interventions with psychical supports also.

Keywords: self-talk, depression, self-esteem, undergraduate students, mental health, self-criticism and Self-Talk Scale.

Introduction

According to the World Health Organisation (WHO, 2016), approximately 676 million individuals (Almost one-tenth of the population worldwide) are affected by mental health disorders. Throughout the past decade, a significant rise in poor mental health has been noted (Twenge, Cooper, Joiner, Duffy & Binau, 2019; Patel & Prince, 2010). Twenge et al. (2019) analysed data collected by National Survey on Drug Use and Health (n = 611,880) between 2005-2017 and noted a 52% increase (From 8.7% to 13.2%) of mood disorders in adolescents and a 63% increase (From 8.1% to 13.2%) in young adults. Furthermore, instances of serious psychological distress leading to suicide-related outcomes (Suicidal ideation, plans, attempts and death from suicide) rose by 71% in young adults aged between 18-24. This is of concern not only for the detrimental impact on those affected by mental health disorders but also because of the related social and economic costs (Kessler et al., 2009). According to The Organisation for Economic Co-operation and Development (OECD, 2018), over €8.2 billion is spent annually as a direct result of mental health problems (drugs prescribed by mental health professionals, preventative counselling, etc.) in Ireland.

In recent years, increased emphasis has been placed on poor mental health in higher-level institutions in particular (Auerbach et al., 2016; Kessler et al, 2007; Kessler & Wang, 2008; Mortier, 2015; Pacheco et al., 2017; Patel & Prince, 2010). Undergraduate students face a variety of novel stressors, such as heavy academic workloads, living away from home, forming new social groups, taking on new commitments and responsibilities which can often trigger or exacerbate mental health difficulties (Conley, Kirsch, Dickson, & Bryant, 2014; Hurst, Baranik, & Daniel, 2013; McLafferty et al., 2017). Kessler et al. (2007; 2008) found that approximately 75% of adults with mental health disorders first began experiencing symptoms before the age of

25, peaking between 18-25 years (Twenge et., 2019). In Ireland, Price & Smith (2019) found that 82% of the Irish third-level student population were between the ages of 18-24, which directly coincides with this age of onset for mental health illnesses (Kessler & Wang, 2008) and the cohort with the highest rising rates of suicidal outcomes (Twenge et al., 2019; Navaneelan, 2012). A 2017 (Pacheco et al., 2017) meta-analysis conducted in Mexico and Brazil found that approximately 31% of university students were struggling with some extent mental health illness.

This is now becoming recognised as a prevalent issue in Ireland also, with a 127% increase in third-level students registering for mental health-related disability services in the past 5 years being reported by the Association for Higher Education Access and Disability (Hynes, 2019). In an effort to respond to this issue, The Union of Students in Ireland conducted a survey in 2019 (Price & Smith, 2019) to gain some insight into the mental health of those studying in Irish third-level institutes. Almost a third (32.2%) of the students sampled (n = 3,340) revealed that they had a formal diagnosis of a mental health disorder. As well as this, 38.4% of students reported to be experiencing severe levels of anxiety (38.4%) and depression (29.9%). Moreover, McLafferty et al. (2017) found that almost one third (31%) of Northern Irish undergraduate students reported to have experienced either suicidal thoughts, plans or attempts at some point during their life.

Depression and anxiety are consistently prevalent in third-level students (McLafferty et al., 2017; Syed et al., 2018, Pacheco et al., 2017, Price & Smith, 2019; WHO, 2016). High levels of stress, both academic and social, are significant predictors of depressive symptomology in students (Dyson & Renk, 2006). When looking at students with a mental health disorder diagnoses in Ireland, the rate of depression diagnoses (74%) is concerningly high (Price &

Smith, 2019). Depression was found to be consistent in undergraduates with the year of study showing no variation in the percentage of depressed individuals, though final year students had significantly higher anxiety scores (Rayhan, 2018). Females were also found to be approximately 2 times more likely to experience depressive symptoms. This may be correlated to the findings of higher observed levels of anxiety in females than men (Rayhan, 2018). Furthermore, instances of serious psychological distress and major depressive episodes were noted to lead to suicide-related outcomes (Suicidal ideation, plans, attempts and death from suicide; Twenge et al., 2019).

Self-esteem is defined as an individual's emotional evaluation of their own worth (Wilder, 1971). Since 1978 (Battle), a direct link has been observed in the levels of high depression with low self-esteem (Sowislo, & Orth, 2013). Moreover, a study conducted in 2000 showed that the higher levels of stress endured, the lower an individual's self-esteem would be (Hudd et al., 2010). This is a big cause of concern for undergraduate students, as they are known to experience higher levels of stress than the general population (Beiter et al, 2015; Kumaraswamy, 2013). This, combined with undergraduates high rates of depressive symptomology (Dyson & Renk, 2006; McLafferty et al., 2017; Syed et al., 2018, Pacheco et al., 2017, Price & Smith, 2019; WHO, 2016), raises concerns as they are very likely to be at risk of experiencing low self-esteem (Hudd et al., 2000). A study by Dixon & Kurpius (2008) suggests that gender, self-esteem, and mattering account for 13.8% of the variance of stress and 39.4% of the variance in depression.

Research (Creemers, Scholte, Engels, Prinstein, & Wiers, 2012; Dieserud et al., 2001) shows that low self-esteem and high depression were the two leading factors for suicidal thoughts in college students. The combination of these two disorders is the strongest predictors

of suicidal thinking (Creemers, et al. 2012). In 2012, the WHO (2016) estimates over 800,000 deaths occurred as a result of suicide and this figure is projected to rise up to 1.53 million deaths by 2020 (Bertolote, & Fleischmann, 2015; WHO, 2016). These growing statistics are a great cause of concern (Twenge et al., 2019; Patel & Prince, 2010; WHO, 2016) and make it necessary to research potential solutions to aid in reducing seemingly widespread, underlying issue rising in modern society (Patel & Prince, 2010).

Self-talk refers to the ongoing internal thoughts and conversations we have with ourselves, which are usually manifested in verbal or non-verbal ways and influence how we feel and behave (Theodorakis et al., 2001). This topic, although shown to be an integral part of our very being, is wildly under-researched (Hardy, 2006). According to Beck et al. (1979; 2005), negative self-talk is a significant predictor of depression. Clarke (1999) suggests that this inner negative dialogue is formed based on the feedback of others and becomes intertwined with our own subjective view of ourselves. However, becoming self-aware and avoiding engagements of negative self-talk to replace with positive monologues have proven to have the opposite effect. Increased self-esteem, better mood and improved performance were just some of the positive effects found (Dolcos & Albarracin, 2014; Wang et al., 2017). While self-talk is often used to improve sports performance (Hardy & Hall, 2001), a significant lack of its everyday use and benefits on mental health has been notably found.

Positive self-talk refers to a cognitive psychological technique aiming to cease negative cognitions that may influence functioning by causing anxiety, depression, and pessimism (Hamilton, Miedema, MacIntyre, & Easley, 2011; Meichenbaum, 1985). Inventions using positive self-talk have been successfully implemented to produce positive outcomes for a wide range of circumstances, including sport performance (Hamilton, Scott, & MacDougall, 2007;

Theodorakis, et al., 2000), coping with medical procedures (Scherzer, 2001) and reducing anxiety and depression (Beck, & Beck, 1995; Kelly, Zuroff & Shapira, 2009; Meichenbaum, 1985). A study by Kelly, Zuroff & Shapira (2009) found that after 2 weeks of engagement of positive self-talk, depression scores dropped from a severe to a moderate range, as well as seeing an increase in self-compassion and self-esteem. However, this study focused on a population of those suffering from severe and current facial acne resulting in psychological distress. Very few studies were found investigating the impact of positive self-talk on a population without the mention of a specific activating event. (Most prominently to aid in sports performance, or to reduce negative psychological effects following some kind of trauma).

According to several studies (McLafferty et al., 2017; Syed et al., 2018; Pacheco et al., 2017; Price & Smith, 2019), both depression and anxiety are prevalent mental health disorders on the rise in the modern age. However, this is especially true when looking at undergraduate students studying in higher-level education (Beiter et al, 2015; Kumaraswamy, 2013; Rayhan, 2018; Price & Smith, 2019). It was found by the USI (Price & Smith, 2019) that in Ireland, approximately one-third (32.2%) of students had been formally diagnosed by a health professional to have some extent of mental health illness. It is estimated, however, that the true figure may be higher as only 32.8% of students reported to seek help prior to beginning college and 42.4% seeking help since beginning college regarding their mental health (Price & Smith, 2019).

The aforementioned correlation observed between depression and low self-esteem (Battle, 1978; Sowislo, & Orth, 2013) is a cause of particular concern in light of the ubiquity of depression diagnoses. Especially when considering that the two leading factors for suicidal thoughts in college students are low self-esteem and high depressive symptomology (Dieserud et

al., 2001). It is vital to conduct research aiming to provide useful aids to the population (Undergraduate students) suffering from these mental health difficulties. Implementing positive self-talk techniques and monologues as well as actively preventing negative self-talk and replacing it with positive techniques has been continually shown to increase mood, performance and raise self-esteem (Beck et al., 1979 & 2005; Dolcos & Albarracin, 2014; Hamilton, Scott, & MacDougall, 2007; Theodorakis, et al., 2000; Wang et al., 2017).

Therefore, the aim of this study is to investigate the relationship between self-talk and levels of self-esteem and depression in undergraduate students by the use of an intervention providing useful techniques. It is hypothesised that the amount of self-awareness and active intervention in reducing negative self-talk will be directly related to increased self-esteem scores and decreased depression scores. Furthermore, another particular point of interest was the correlation between the frequency one engages with each of the four main types of self-talk (Self-criticism, Self-Reinforcement, Self-Management and Social Assessment; Brinthaupt, Hein & Kramer, 2009) and baseline scores of depression and self-esteem. This was measured to gain better insight into the influence of regular negative self-talk engagements on an individual's mood and self-esteem. A number of relevant demographic factors will be measured, and surface analyses will also be conducted to monitor whether the study's results are in-line with previous literature and to determine suggestions for the direction of future research.

The hypotheses of the study are as follows:

1. There will be a significant interaction effect between the two groups (Control and Intervention) and time (Base and Post) for both depression and self-esteem scores following the study's 2-week self-talk intervention.
2. Year of study will have no impact on depression and self-esteem scores.
3. Females will have significantly higher depression scores and lower self-esteem scores than men.
4. Higher scores of self-criticism, self-management and social assessment engagements will significantly predict higher depression scores and lower self-esteem scores.

Methods

Participants

Ninety individuals took part in the baseline measure, while forty-seven completed all aspects of the study, including the 2 week intervention period and the follow-up questionnaire. From doing a G-Power calculation using a two-tailed matched pair t-test, the researcher was able to conclude that a sample size of 45 participants would be needed to find results with an effect size of 0.55, error probability of 0.05 and power of 0.95. This participant quotient was met. The sample consisted of undergraduate students aged over 18 studying in a higher-level institution. The majority of participants were Females (n = 62), with just one-third (31.1%) of participants identifying as Male (n = 28). Age ranged from 18-49 years, with an average of 21.9 years (SD = 5.6). The majority of participants (87.8%) were either in First Year (n = 43), or Final Year (n = 36), while there were only a handful in Second Year (n = 8), or Third Year ((Non-Final) n = 3). Participants were placed into either the Intervention (n = 26) or Control (n = 21) group by means of random allocation facilitated by use of a true random number service (www.random.org; Haahr, 2020) upon their completion of the baseline questionnaire. Each participant had an equal chance of taking part in either condition.

Recruitment was conducted by means of convenience sampling. All participants were approached in one of two ways; either by a social media post (Posts were made on both the researcher's personal social media pages or in a Facebook group entitled 'Dissertation Survey Exchange'. This group aimed to aid final year students in recruiting participants by sharing and completing one another's questionnaires.), or by holding brief class addresses to psychology students that the researcher had access to in the National College of Ireland. If any student was interested in participating in the study after this address, they would write their 'Student number'

onto a lined sheet of paper provided by the researcher. Interest was collected in this way as student numbers were non-identifiable and also correlated to the individual's student email. As soon as an email was sent linking the study's Google Form, their information, including the sheet was destroyed. Individuals were not coerced to take part in any way, and each participant was required to provide informed consent before the commencement of any data collection. Informed consent was obtained through the study's initial Google Form page. This page explained the study and its purpose, exclusion criterion and the participants' right to withdraw from the study at any point under the Freedom and Information Act and debriefing materials (Appendix A).

No monetary or reward otherwise was provided other than helping the study. Individuals who self-identify as under 18, having an intellectual or learning disability, having had either a current or historically diagnosed mental health disorder, reporting to be going through a personal crisis and those who do not understand the research were asked to be excluded.

Experimental Design

The study was conceptualised using a Mixed 2x2 factorial design with repeated quantitative methods. The between-participant independent variable (IV) was Group, with two levels, of either Control or Intervention. The within-participant repeated measure was Time, with two levels again, of Baseline and Post-Intervention scores. The two dependent variables (DV) were participant's depression and self-esteem scores.

Measures/Materials

For the primary hypothesis; depression scores were measured using the 'The Center for Epidemiologic Studies Depression scale (CES-D)' (Radloff, 1977- See Appendix B) while self-esteem scores were measured by 'The Rosenberg Self-Esteem Scale' (Rosenberg, 1965- See Appendix C). Engagements in different types of self-talk were scored using the 'Self-Talk Scale' (Brinthaupt, Hein & Kramer, 2009- See Appendix D). These Self-Talk scores along with demographics measuring age, gender and year of study were collected to test the secondary hypotheses.

The CES-D is a scale consisting of 20 questions of various depressive symptomologies on a 4 point Likert scale, it has a good internal consistency with a Cronbach's alpha from 0.89 to 0.92. Scores range from 0-60 with higher scores indicating higher depressive tendencies. Although the CES-D is not to be used in a clinical setting, nor is it a replacement for DSM-diagnoses, scores above 15 are generally interpreted as an indication of a risk of depression (Eaton et al., 2004). Previous research (González et al., 2017) has also supported the test-retest reliability of the CES-D, with correlation values in a moderate range after 2-weeks (r = .51; Radloff, 1977).

'The Rosenberg Self-Esteem Scale' (Rosenberg, 1965- Appendix C) is a well-established 10 item, 4 point Likert scale measuring self-esteem scores between 0-30. It is highly regarded as a reliable with internal consistencies of 0.77 and a coefficient of reproducibility of at least 0.90. Test-retest reliability is high, with a score of 0.85 at a 2-week interval (Simmons, Rosenberg & Rosenberg, 1973). Lower scores indicate lower self-esteem and scores below 15 typically indicate problematic low self-esteem.

Finally, self-talk engagements were measured by the 'Self-Talk Scale' (Brinthaupt, Hein & Kramer, 2009- See Appendix D). This scale consists of 16 questions with four questions measuring each of the four main types of self-talk (Self-criticism, Self-Reinforcement, Self-Management and Social Assessment) on a 5-point Likert scale. It has good reliability also, with the Cronbach's alpha ranging from .79-.89, as well as all factor covariances producing significant results (p = < .001). Correlations between individual scale items were all significant (p = < .001)., and indicate good stability.

The Self-Talk intervention (Appendix G, H & I) used in the study was loosely based on aspects of Cognitive Behavioural Therapy, such as cognitive restructuring techniques (Larsson et al., 2016) and aiming to reduce unhelpful rationalisations (Driessen & Hollon, 2010). A pilot version of this intervention was tested (n = 2) over 2 days. Based on feedback from the pilot, adjustments regarding material distribution were made accordingly. In order to avoid information overload, the intervention materials were spilt into two emails. The initial email contained a summary of information providing techniques to conduct the self-intervention (Appendix G). As well as examples of positive self-talk replacements (Appendix H) to aid in participants' understanding of what kind of engagements they should be intervening in, and how to replace them. A second 'check-in' email provided a number of novel 'tips' to aid in cognitive restructuring (Appendix I).

Procedure

As the current study deals with human participants, ethical approval was sought out from the Ethics Committee in the National College of Ireland. As a result of active involvement in directly monitoring negative thoughts of yourself, participation may cause unpleasant feelings of

differing levels. Though, as everyone is on some point on a depression/self-esteem scale, it is still important to have supports available if individuals require it. If the participant requests to withdraw their data from the study, it is also the researcher's responsibility to effectively dispose of all their data immediately. It was made clear that if at any time, they wished to withdraw from the study, they were free to do so under the Freedom and Information Act.

Upon opening the link individuals will have received through email or came across on social media platforms, they were directed to a Google Form. The initial page contains all information about the study's purpose, what their participation entailed and their right to withdraw at any point in the study (Appendix A). They were asked to read through this information carefully to decide whether they wished to take part in the research. They were then required to provide informed consent by ticking a box at the end of the page, to proceed to the next page. The subsequent page measured demographic variables of gender (Male, Female or Non-Binary), age and year of study (First Year, Second Year, Third Year (Non-Final) and Final Year). The following three pages displayed the 'The Rosenberg Self-Esteem Scale', 'The Center for Epidemiologic Studies Depression scale' and 'Self-Talk Scale' as outlined above. Each question in these scales were automatically shuffled randomly in order to reduce recognition memory. Participants would then reach a 'Thank you' page displaying the researcher's and support helplines' contact information if they so require it. They are asked for their email address, which they must provide to continue to the intervention phase. Clicking submit automatically complied the participant's data into a 'Google Sheets' dataset which was encrypted with a password by the researcher.

Using a true random number service (www.random.org; Haahr, 2020) with a minimum of 1 and a maximum of 2, each participant was assigned to a group based on whether the number 1

(Intervention) or 2 (Control) was generated. This was noted into a new column in the 'Google Sheets' dataset, as well as an assigned participant number. Those in the intervention group were assigned a number following the letter A, while control participants' number began with the letter B (i.e. A42, B13, etc.).

A google account (Gmail) was then created to contact participants. This email would be deleted after data collection was complete to ensure the subjects' pseudo-anonymity until data could be de-identified. Those in the control group received an encrypted email simply stating that they would be contacted in 2 weeks' time (Appendix E). Whereas, those in the intervention group received an encrypted email asking to remain mindful of negative self-talk engagements and providing techniques aiming to replace these negative cognitions with positive ones (Appendix F). A word document was also attached to this email, which listed examples of negative self-talk, as well as some examples of cognitive reappraisal of more constructive self-talk (Appendix G). While this document was not necessary for the completion of the intervention, it acted as a crutch for those who did not fully understand what was expected of them. At the mid-way point of the experiment (One week after the baseline questionnaire was completed), participants conducting their self-intervention received a 'check-in' email describing tips to further aid them (Appendix H).

Exactly 2 weeks after the participant completed the baseline questionnaire, they received a final follow-up. In this email, they found their participant number and a link to the post-intervention questionnaire. The first page simply listed the researcher's contact information and asked for the individual's assigned participant number. The following two pages measured the 'The Rosenberg Self-Esteem Scale' and 'The Center for Epidemiologic Studies Depression scale' again, as to provide the post-scores. Finally, the participant would reach the debriefing

form (Appendix I), which outlined which group they were in, how their data would be handled and thanked them for their participation.

Data was then exported to Microsoft Excel, where all the data was converted to numeric scores. Following this, it could then be imported to the software IBM SPSS (2016) where data was cleaned and recoded as appropriate, allowing for statistical tests to begin. By this point, all data stored in SPSS had been fully deidentified and any identifying data was disposed of in order to protect participants. The data collected from this study will be kept for 5 years for further analyses. Full responsibility is placed on the researcher to store, handle and transfer of all data with care.

Results

Descriptive statistics demonstrate frequencies for categorical variables, and as well as mean, standard deviation, range and reliability for the continuous variables measuring the hypothesis as using the baseline data set consisting of ninety participants. See table 1. Preliminary analyses using the Kolmogorov-Smirnov statistic suggest no violations of normality. Moreover, an inspection of the Q-Q Plots and Histograms, the data appear normally distributed among all continuous variables.

Table 1

Descriptive statistics and reliability of all continuous variables measuring the hypothesis

Variables	*Mean*	*SD*	*Range*	*Possible Range*	*Cronbach's Alpha*
Base Depression Total	24.00	12.66	56	0-60	.93
Base Self-Esteem Total	17.13	7.09	28	0-30	.92
Self-Criticism	8.09	4.25	16	0-16	.87
Self-Management	10.26	3.88	16	0-16	.82
Self-Reinforcement	7.94	3.96	16	0-16	.87
Social Assessment	10.03	4.51	16	0-16	.89

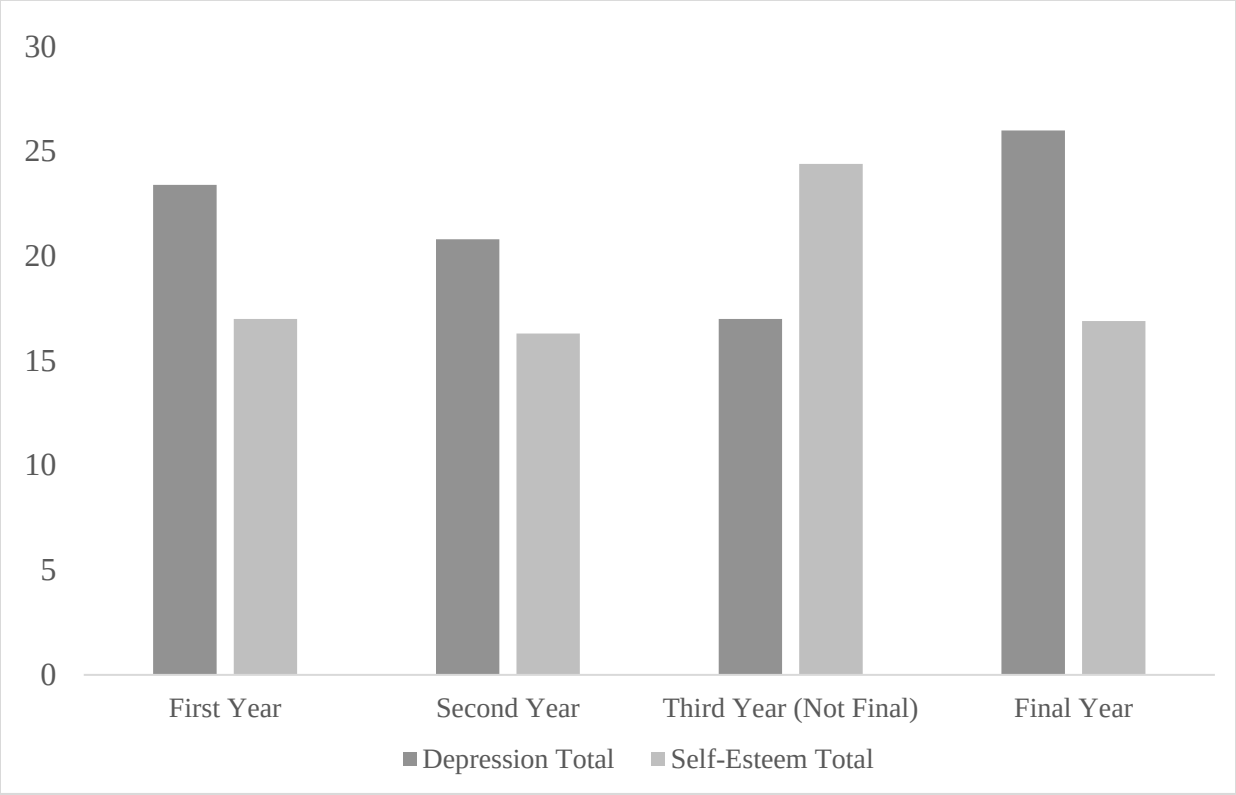
Note. Statistical significance: *= $p < 0.05$, **$p < .01$

Inferential statistics

Firstly, a series of independent samples t-test was conducted to compare scores of depression and self-esteem between males and females. No significant difference was indicated

in depression scores ($t(88) = .83$, $p = .411$) with females ($n = 62$, M = 24.74, SD = 12.35) scoring higher than males ($n = 28$, M = 22.36, SD = 13.39). The magnitude of the differences in the means (Mean difference = 2.38, 95% CI: -3.35 – 8.12) was small (Cohen's d = 0.18). Nor were any significant differences found in self-esteem scores ($t(88) = -.87$, p = .384) with males (N = 28, M =18.10, SD = 6.72) scoring higher than females ($n = 62$, M = 16.70, SD = 7.26). The magnitude of the differences in the means (Mean Difference = 1.4, 95% CI: -4.63 – 1.80) was also small (Cohen's d = .20).

Two One-way ANOVAs were conducted to examine the impact of year of study (First Year, Second Year, Third Year (Not Final) or Final Year) on depression and self-esteem. No statistically significant difference were found between groups for either depression ($F(3,43) = 1.67$ $p = .19$), nor self-esteem ($F(3,42) = 1.16$, $p = .336$).



Graph 1. Mean Depression and Self-Esteem Scores for each Year of Study.

A Pearson's correlation analysis was then conducted to measure the impact of different self-talk engagements on the baseline scores of depression and self-esteem (See Table 2). Each of the four types of Self-Talk (Self-Criticism, Self-Management, Self-Reinforcement and Social Assessment) were found to be significantly related to depression scores. Higher depression scores were correlated with more frequent engagements in Self-Criticism ($R^2 = .20$), Self-Management ($R^2 = .06$) and Social Assessment ($R^2 = .14$), while lower depression scores were associated with high engagements in Self-Reinforcement ($R^2 = .12$). Similarly, lower self-esteem scores were correlated with more frequent engagements in Self-Criticism ($R^2 = .25$), Self-Management ($R^2 = .03$) and Social Assessment ($R^2 = .15$), while higher self-esteem scores were associated with high engagements in Self-Reinforcement ($R^2 = .14$). The highest correlation was between depression and self-esteem ($r = .74$, $p = < .01$, $R^2 = .55$).

Table 2

Correlations between all variables included in the model.

Variables	*1*	*2*	*3*	*4*	*5*	*6*
1. Base Depression Total	1	-.74**	.45**	.24*	-.35**	.37**
2. Base Self-Esteem Total		1	-.50**	-.16	.37**	-.39**
3. Self-Criticism			1	.51**	.10	.63**
4. Self-Management				1	.33**	.71**
5. Self-Reinforcement					1	.27*
6. Social Assessment						1

Note. Statistical significance: *= $p < 0.05$, **$p < .01$

Preliminary analyses were conducted to ensure no violation of normality was made and homogeneity of variance. Levene's Test of Equality of Error Variances showed a non-significant result for both depression (p = .96) and self-esteem (p = .3), with Box's Test of Equality of Covariance Matrices also showing a non-significant for both depression (p = .65), and self-esteem (p = .13). With Mauchly's Test of Sphericity assumed in both cases, the data was now ready to be analysesd. The results of the Two-Way Mixed ANOVA showed that there while there was significant effect of time (F(1, 45) = 31.69, p = <.001, ηp 2 = .413) on depression scores, there was no significant main effect for group (control versus intervention groups) (F(1, 45) = .32, p = .575, ηp 2 = .007). When looking at self-esteem scores, the same was true. While self-esteem scores did rise significantly over time (F(1, 45) = 10.88, p = .002, ηp 2 = .19), the group differences were not significant (F(1, 45) = 3.60, p = .064, ηp 2 = .074).

Table 3

Group descriptive statistics categorized by Time and Group Condition.

Variable	*Group*	*N*	*M*	*STD*	*F*	*p*
Depression						
Time	Base	47	23.23	12.67	31.70	.000
	Post	47	15.64	10.27		
Group (Mean)	Intervention	26	17.55	10.53	.32	.575
	Control	21	21.76	12.33		
Self Esteem						
Time	Base	47	17.28	7.24	10.88	.002
	Post	47	19.30	6.55		
Group (Mean)	Intervention	26	19.38	6.10	3.60	.064
	Control	21	16.93	7.64		

Discussion

The aim of this study was to investigate the influence of negative self-talk on depression and self-esteem scores in undergraduate students. It was hypothesised that there would be a significant interaction effect between the two groups (Control and Intervention) and time (Base and Post) for both depression and self-esteem scores following the study's 2-week self-talk intervention. Meaning that depression scores should decrease, while self-esteem scores should increase as a direct result of participation in the active intervention of negative self-talk. However, the study's results did not reflect this interaction in a significant way.

When looking simply at the effect of time (Baseline and Post scores), a statistically significant change was recorded for both dependent variables. Mean depression scores decreased by from 23.23 to 15.64 ($p < .000$), while mean self-esteem scores increased from 17.28 to 19.30 ($p = .002$). This result was rather unexpected as significant score changes were only anticipated for the time/group interaction. This may have been influenced by the study's timeline coinciding with most third-level institutes' exam period. This cofounding variable was likely a significant influence on mood, as the majority of participants would begin the study prior to sitting exams, and conclude the intervention post-exams. This is of concern, as the period coming up to exams are known to be quite cumulatively stressful (Beiter et al, 2015; Conley, Kirsch, Dickson, & Bryant, 2014; Hurst, Baranik, & Daniel, 2013; McLafferty et al., 2017), however, this factor could not be controlled. With regards to previous literature, a general decrease in depression scores over time has been noted. Whiteford et al.'s (2012) study measured spontaneous remission from depressive disorders saw that an estimated 23% of cases with major depression would remit after 3 months. Considering that the current study is simply dealing with those

suffering from non-clinical levels of depressive symptomology, it is possible that this remission period may have occurred faster than a clinical group (Whiteford et al., 2012). As previous literature has observed a direct correlation of high depression scores on low self-esteem (Dixon & Kurpius, 2008; Hudd et al., 2000; Sowislo, & Orth, 2013), the decrease in depression scores likely had a significant influence in the rise of participant's self-esteem also.

With this being said, the intervention itself had no statistically significant influence of either depression ($p = .575$) nor self-esteem scores ($p = .064$) when measuring against the control group. This was likely due to a number of limitations the study itself had, such as having a small sample, relying on participants to self-intervene and having a short time frame. While previous literature (Kelly, Zuroff & Shapira, 2009) have found a 2-weeks of positive self-talk enough to observe a significant change in mood, self-compassion and self-esteem, this research has been consistently conducted on a population of those with a clinical diagnosis of depression (Beck, & Beck, 1995; Kelly, Zuroff,& Shapira, 2009; Meichenbaum, 1985). Perhaps, as the mean baseline depressive symptomology that the undergraduate population experience (Excluding those with a mental health disorder) is far lower than those in previous research (Beck, & Beck, 1995; Kelly, Zuroff & Shapira, 2009; Meichenbaum, 1985), it would have required a more dramatic change in scores to produce a significant result, which was not possible in the time-frame available to the study.

Year of study had no significant impact on either dependent variable, however, those in Final Year had the highest mean depression and lowest mean self-esteem scores in comparison to the other cohorts. This result was as hypothesised and produced figures in line with previous literature by Rayhan (2018), who also noticed no mental health (Depression & Anxiety scores) variations between years, but also found that final year students were the most cumulatively

anxious, and in turn, had the highest depression scores. However, it should be noted that as Year of Study cohorts were very disproportionate (First Year: n = 43, Second Year: n = 8, Third Year (Non-Final): n = 3, Final Year: n = 36), it did not allow for representative figures of each cohort, and the subsequent population.

There was a nonsignificant result between gender difference in the scores of the dependent variables. It was hypothesised that females would score significantly higher in depression and lower self-esteem scores. While results regarding gender differences often vary in the literature, a significant difference was anticipated for depression, as previous literature had found scores almost two times higher in females (Rayhan, 2018). This may have been due, in part, to several high-scoring male outliers. It was unclear whether these outlying scores were related to participant's gender or whether some other variable may have resulted in a higher concentration of unusually high scores in men rather than women. The researcher did not exclude this outlying data as it was still believed to be proportionate to the population and in normal distribution.

Correlation analyses found that higher engagement in scores of self-criticism, self-management and social assessment significantly predicted higher depression scores and lower self-esteem scores, while higher scores in self-reinforcement resulted in the opposite. Furthermore, greater depression scores also explained a 55% (r = -.74, p = < 0.01) of variance in lower self-esteem scores. Self-criticism had the correlation resulting in negative outcomes, explanation of -25% and 20% variance on self-esteem and depression scores with respectively. On the other hand, self-reinforcement had the highest correlation resulting in positive outcomes, explaining 12.25% and -13.69 variance on self-esteem and depression respectively, again.

Limitations

A glaring limitation of the study is the fact that the intervention was conducted through a self-help medium. It was entirely up to each participant to conduct their own intervention, and it as the study was conducted purely through the use of the internet, it was impossible to accurately measure how individuals interacted with the materials provided to them. This may have been a significant influence on the efficacy of the intervention based on the results that were produced. Furthermore, as each scale also employing self-report measures, which may have also influenced the accuracy of scores. Finally, as outlined by Brinthaupt, Hein & Kramer (2009), a limitation of the Self-Talk scale is that it focuses on general assessments of self-talk engagements, rather than situation-specific engagements.

Secondly, due to time constraints, data collection was limited between December and January. According to Kasser and Sheldon (2002), almost half of undergraduate students (n = 43) report the festive period before and directly Christmas-time as stressful. While the prevalence of 'Christmas Blues' remains debated (Eghigian, 2016; Hairon, 2008), it is possible it could have impacted the high scores of depression that decreased so significantly with time. More notably, as mentioned, this timeline also coincided with many third-level institution's exam periods which created another confounding variable. Especially when tress higher levels of stress endured, the lower an individual's self-esteem would be (Hudd et al., 2010)

As a result of the population that was available to the researcher, variation in participants' year of study was greatly limited. For class addresses, the researcher only had access to a First-Year psychology course in the National College of Ireland. Moreover, as the study's Google Form link was mostly circulated through college peers, and a 'Dissertation Survey Exchange' for

final year students, it ultimately resulted in the majority (87.8%) of participants being in either First (47.7%) or Final Year (40%) students. This made it very difficult to accurately measure discrepancies between dependent variable scores throughout third-level education.

Future Research

The two-week timeline of the study was short. It would be worthwhile to implement such an intervention over a longer period, to allow for more accurate measurements of the intervention's viability. Furthermore, if the situation allows for it, future studies' intervention timeline should aim to avoid the holiday season, as well as exam periods, as it has been identified as a cumulatively stressful time for many. It would be of interest to see whether the lack of this cofounding variable would have any impact on the dependent variable scores both pre and post-intervention. Self-talk interventions, in general, should also continue development, with particular focus on aiding to reduce self-criticism and improve self-reinforcement.

It is recommended by the researcher that a psychical support system may also be included in future research. Such as the involvement of a trained psychological professional to aid in cognitive reappraisals (Kelly, Zuroff & Shapira, 2009), or to involve peer-support by the use of a group-intervention instead (Hamilton, et al. 2011). According to past literature, these measures greatly aid with resulting in positive outcomes (Kelly, Zuroff & Shapira, 2009; Hamilton, et al. 2011).

Conclusions and Implications

The current study highlights the impact of how we interact with ourselves has on our mood and self-esteem. The results of this study indicate that reducing engagements in self-criticism and social assessment while increasing engagements in self-reinforcement may produce positive outcomes in both an individual's mood and self-esteem. Findings also highlight the vulnerability of the population, as base depression scores (M= 23.23) were above the cut-off value of 15, which has been indicated as a risk for depression diagnoses (Eaton et al., 2004). These figures further solidify the prevalence of the rise in poor Irish mental health (Hynes, 2019; McLafferty et al., 2017; Price & Smith, 2019), and it is vital to continue to studying this field of research to better understand and support these individuals. Specific investigation should be taken into producing material to aid individuals in reducing self-critical self-talk engagements in particular, given the correlation it was found to have for negative health outcomes.

On a more general level, with the time/group interaction effect on self-esteem scores approaching significance, the study's findings may also suggest the salience of becoming self-awareness of negative engagements.

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Appendix

Appendix A. Information and Consent Form.

You are invited to take part in an undergraduate final year research study, involving a 2-week intervention.

Before you decide whether to take part, please read through this information, which explains your role in the study and the nature of the research being conducted.

What is the study about?

The present study investigates if self-talk influences mood in undergraduate students. This study aims to gain insight into the level of influence self-talk (how you interact and behave with yourself) has on self-esteem and negative mood in undergraduate students by means of implementing a self-talk intervention. This intervention aims to increase self-awareness and reduce engagements of negative self-talk.

What does participation of this study entail?

If you decide to take part in this study, you will be asked to fill out an online questionnaire, measuring depression, self-esteem and self-talk engagement scores. The initial questionnaire consists of a total of 50 questions and it is typically completed in 15 minutes. You will then be contacted through email and receive materials outlining tips and techniques to conduct a self-intervention on how to manage negative self-talk practices. You will be asked to implement these practices for 2 weeks, after which, you will receive a second questionnaire. This second questionnaire will consist of 30 questions and will take approximately no more than 10 minutes to complete.

What are the risks and benefits for taking part?

It is possible that individuals may experience minor emotional distress from completing the questionnaire. Those who are going through a personal crisis or individuals who have either a current or historic diagnosis of a mental health disorder may be especially vulnerable, and for this reason, those who fall into these categories are not eligible to take part in this study. However, participants are expected to gain insight into their internal processes and may benefit from an improvement in self-esteem and mood levels upon completing the intervention in full. Furthermore, your participation will contribute to research that may help understand how to reduce negative mental health.

Will my data remain confidential?

Due to the nature of the study, participants will need to provide contact information to receive details of the intervention. However, you will be given an ID number and your data will be stored strictly on a strictly unidentifiable basis. Furthermore, this data will be stored on the basis of an encrypted, password-protected folder, which is only accessible by the main researcher. No data will be shared with any other individual and all shared information is strictly confidential. Upon completion of the post-intervention questionnaire, your de-identified data will be stored for up to 5 years.

Do you have to take part?

Participation of this study is entirely voluntary and there are no repercussions if you choose not to take part. You may also withdraw from this study at any point, for any reason, without penalty. If you feel distressed at any point, we encourage you to contact the researcher. It should be noted, however, that if you choose to withdraw from the study, that because your data is stored on an unidentifiable basis, it can only be removed after the study has reached its' post-intervention phase.

Contact Information

If you have any questions, concerns or queries relating to this study or your role, please do not hesitate to get in contact.

You can contact the researcher (Teodora Camarasu) at TeodoracamarasuFYP@gmail.com

Furthermore, you can contact the research supervisor (Fearghal O'Brien) at Fearghal.OBrien@ncirl.ie

Informed Consent

Please tick the box below to confirm that:

1) You are 18 years of age or over.
2) You are a current undergraduate student studying in a third-level institution.
3) You do not have a current or historic diagnosis of a mental health disorder.
4) You have read as well as understood the above information and agree to take part in this study.

Consent

I agree. ☐

Appendix B. The Center for Epidemiologic Studies Depression Scale.

During the past week	Rarely	Some of the time	Moderate amount of time	Most of the time
1. I was bothered by things that usually do not bother me.				
2. I did not feel like eating; my appetite was poor.				
3. I felt that I could not shake off the blues even with help from family or friends.				
4. I felt I was just as good as other people.				
5. I had trouble keeping my mind on what I was doing.				
6. I felt depressed.				
7. I felt that everything I did was an effort				
8. I felt hopeful about the future.				
9. I thought my life had become a failure.				
10. I felt fearful.				
11. I talked less than usual.				
12. I was happy.				
13. I talked less than usual.				
14. I felt lonely.				
15. People were unfriendly.				
16. I enjoyed life.				
17. I had crying spells.				
18. I felt sad.				
19. I felt that people dislike me.				
20. I could not get ‘going’				

Appendix C. The Rosenberg Self-Esteem Scale.

	Strongly Disagree	Disagree	Agree	Strongly Agree
1. I feel that I am a person of worth, at least on an equal plane with others.				
2. I feel that I have a good number of friends.				
3. All in all, I am inclined to feel that I am a failure.				
4. I am able to do things as well as most other people				
5. I feel I do not have much to be proud of.				
6. I take a positive attitude toward myself.				
7. On the whole, I am satisfied with myself.				
8. I wish I could have more respect for myself.				
9. I certainly feel useless at times.				
10. At times, I think I am no good at all.				

Appendix D. Self-Talk Scale.

I talk to myself when:	Never	Seldom	Sometimes	Often	Very Often
1. I should have done something differently. [self-criticism]					
2. Something good has happened to me. [self-reinforcement]					
3. I need to figure out what I should do or say. [self-management]					
4. I'm imagining how other people respond to things I've said. [social assessment]					
5. I am really happy for myself. [self-reinforcement]					
6. I want to analyze something that someone recently said to me. [social assessment]					
7. I feel ashamed of something I've done. [self-criticism]					
8. I'm proud of something I've done. [self-reinforcement]					
9. I'm mentally exploring a possible course of action. [self-management]					
10. I'm really upset with myself. [self-criticism]					
11. I try to anticipate what someone will say and how I'll respond to him or her. [social assessment]					
12. I'm giving myself instructions or directions about what I should do or say. [self-management]					
13. I want to reinforce myself for doing well. [self-reinforcement]					
14. Something bad has happened to me. [self-criticism]					
15. I want to remind myself of what I need to do. [self-management]					
16. I want to replay something that I've said to another person. [social assessment]					

Appendix E. Thank you page of the Baseline Questionairee.

Thank you

Thank you for taking the time to participate in this study. You have reached the end of the questionnaire. Please provide your email address below and click submit to begin the intervention phase of the study. You will receive an email shortly detailing the tips and techniques you will be asked to implement for increased self-awareness and deceased negative self-talk. After the proposed 2-week time frame of the intervention, you will receive a second email with a short post-intervention questionnaire.

As a reminder, your email address will be stored in an encrypted folder during the intervention phase of the study and will be swiftly destroyed as soon as you complete the study.

If you have any questions, concerns or queries relating to this study, please contact me (Email: TeodoraCamarasuFYP@gmail.com) or my supervisor (Email: Fearghal.OBrien@ncirl.ie). If you are feeling distressed and are unable to contact a person associated with the study, please contact the onsite counsellor; Mary Keating (Email: counselling@ncirl.ie ; Tel: 086 8783 086) or the following helplines:

Samaritans:

‘Provides a helpline service 24 hours a day, 365 days a year to those going through difficult times or facing a personal crisis.’

Helpline (24hrs): 116 123

Aware:

‘Providing online, phone and face to face support to all those affected by depression.’

Helpline: 1890 303 302

Email: supportmail@aware.ie

Please provide your email address.

_____

Appendix F. Email received by participants in the Control Group.

A sincere thank you for your participation in my Undergraduate Final Year Project.

As a reminder, this study aims to investigate the relationship between self-talk on mood and self-esteem. Your contribution to this research is greatly appreciated and may lead to a better understanding of how to reduce negative mental health in the future.

I will be in contact with you again in two weeks time to measure the changes in your mood and self-esteem scores. In the meantime, if you have any questions regarding the research or your participation, please do not hesitate to contact me through this email.

Appendix G. Email received by participants in the Intervention Group.

Thank you for your participation in my Undergraduate Final Year Project. Please take the time (No more than 5 minutes) to **read through the details of the study below**, which you will be implementing for the **next 2 weeks**.

Self-talk is any conversation or dialogue that is going on inside our heads and we engage in daily. The aim of this study is to help you become more self-aware of engagements in negative self-talk and help you replace this with more positive self-talk.

The key to the successful implementation of this intervention is to **identify negative engagements** and **create positive, facilitating thoughts**. Over the next **2 weeks,** you are being asked **to be mindful and aware of your self-talk,** paying particular attention to **negative** self-talk and to what may have evoked it.

How to implement Positive Self-Talk

1. The first step is to **identify engagement in negative self-talk**. Stay mindful and self-aware.
2. Next, identify **what situation evoked this**.
3. **Reflect on whether this thought is objectively true**. Be level-headed and think rationally -do facts support the truthfulness of this thought or image? Perhaps ask yourself if your best friend had this thought, what you would tell them.
4. Now, try to **think of something more constructive and realistic that you could say to yourself instead.**
5. Finally, reflect on if this situation were to arise again, **would you deal with it differently**?

I've attached a word document of examples of positive and negative self-talk that may be useful to you in this.

Here is an example of implementing Positive Self-Talk

1. If you were to think 'I messed up. I am useless.'
2. You may identify 'I am scared of not being good enough.'
3. You would then step back and reflect on this statement rationally: 'Regardless of my performance, I am a person of worth and I have many qualities that prove this.'
4. You would next try to re-adjust your feelings in favour of a more constructive thought to reflect this. 'Maybe I didn’t do the best, but I know I am capable of better next time.'
5. In the future, you could try to be less harsh on yourself in similar situations. This may improve both your mood and performance.

I will be in contact with you again soon to aid you with the successful implementation of this study. If you have any questions regarding the research or your participation, please do not hesitate to contact me through this email.

Appendix H. Further materials received by participants in the Intervention Group.

Examples of negative self-talk may include:

1. I can't do this.
2. I messed up.
3. I must pass this test.
4. I've never done this before.
5. It's too complicated.
6. I'm not getting any better at this.
7. No one bothers to communicate with me.
8. This is too hard.

If you catch yourself engaging in these interactions, try thinking of what made you sparked this feeling and replacing these thoughts with more productive ones.

Such as:

1. I can do this.
2. Maybe I didn't do the best, but next time will be better.
3. I will study and do my best to pass this test.
4. This is an opportunity to learn something new.
5. I'll tackle it from a different angle.
6. I'll give it another try.
7. I'll see if I can open channels of communication.
8. This might be really hard, but I know I can get through it.

Here are some examples of positive self-talk you may want to use.

- I am doing the best I can, given my history and level of current awareness.
- It is okay to let myself be distressed for a while.
- I am not helpless.
- I can & will take the steps needed to get through this crisis.
- I will remain engaged & involved instead of isolating & withdrawing in this situation.
- This is an opportunity, instead of a threat.
- I will use this experience to learn something new, to change my direction, or to try a new approach.
- One step at a time.
- I can stay calm when talking to difficult people.
- He/she is responsible for their reaction to me.
- I can stand anything for a while.
- Is this really important enough to become upset about?
- I don't really need to prove myself in this situation.
- Others are not perfect; I will not put pressure on myself by expecting them to be.
- I cannot control the behaviours of others, I can only control my own.
- I am not responsible for making other people feel okay.
- I will respond appropriately, and not be reactive.
- I feel better when I don't make assumptions about others' thoughts and behaviours.
- I will enjoy myself even when life is hard.
- I will enjoy myself while catching up on all that I want to accomplish.
- Don't sweat the small stuff – it's all small stuff.
- My past does not control my future.
- I choose to seek happiness.
- I am respectful to others and deserve to be respected in return.
- There is less stress in being optimistic and choosing to be in control.
- I am willing to do whatever is necessary to make tomorrow better.

Appendix I. Check-in email received by participants in the Intervention Group.

I hope the intervention is progressing well and you're starting to see some positive change in your self-talk as we reach the study's half-way point. To aid you further in this, I've included some tips below to keep in mind for your final week of the intervention.

Useful tips to remember

1. **Try to be an optimist.** Self-talk is a choice. Choose the glass-half-full view on every difficult situation.
2. **Remain realistic and objective.** Think constructively, not just positively.
3. **Focus on the present, instead of the past.** You cannot change the past, so try not to dwell on bad experiences. Instead, try to see them as opportunities for new learning experiences.
4. **See situations as challenges rather than threats.** See problems as opportunities to learn.
5. **View success as replicable and failures as opportunities to do better.** Think of success as a result of your ability and effort, not from luck.
6. **Concentrate on the process rather than the product.** Even if the end product isn't what you hoped for, focus on what you did to get there.
7. **Focus on only things that are 'Controllable'.** Try not to focus on situations that are out of your control.
8. **Separate performance from self-worth.** We are not our performance.

Try to keep these tips in mind whenever possible and refer back to both the initial email and this one if necessary to refresh your knowledge of the key techniques. Best of luck in the final week. I will be in contact with you next week with the post-intervention questionnaire.

Appendix J. Debriefing form in the Follow-up Questionairee.

Debriefing

Thank you for taking the time to participate in this study. You have reached the end of the study and all data you have provided is now de-identified by means of a participant number. If your participant number began with the letter A, you were in the intervention group which looked at the influence of active intervention of negative self-talk. Those with a participant number starting with the letter B were in the control group, which simply measured depression and self-esteem score differences over the two week period.

If you have any questions, concerns or queries relating to this study, please contact me (Email: TeodoraCamarasuFYP@gmail.com) or my supervisor (Email: Fearghal.OBrien@ncirl.ie). If you are feeling distressed and are unable to contact a person associated with the study, please contact the onsite counseller; Mary Keating (Email: counselling@ncirl.ie; Tel: 086 8783 086) or the following helplines:

Samaritans:

Provides a helpline service 24 hours a day, 365 days a year to those going through difficult times or facing a personal crisis.

Helpline (24hrs): 116 123

Aware:

Providing online, phone and face to face support to all those affected by depression.

Helpline: 1890 303 302 OR Email: supportmail@aware.ie

Appendix K. Evidence of Data Collection.