

The Effectiveness of Cognitive Behavior Group Counseling to Improve Career Decision Making Self-Efficacy of Senior High School Students

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ABSTRACT

This study aims to determine the effectiveness of Cognitive Behavior Group Counseling to improve career decision making self-efficacy of high school students. This research is a quantitative research with a quasi-experimental design. The research design was the pre-test and post-test control group design. The population in this study were 144 students of class XII SMA Negeri in Singaraja district who had a very low level of self-efficacy in career decision making. The research sample consisted of 12 students obtained through purposive sampling technique. The sample consisted of 6 students as the experimental group and 6 students as the control group. Data collection uses a career decision making self-efficacy measurement scale. The results showed that Cognitive Behavioral Group Counseling was effective to improve career decision making self-efficacy for high school students. This research has implications for the implementation of counseling in schools related to the cognitive restructuring process of students.

Keywords: *Cognitive Behavior Group Counseling, Self-Efficacy, Career Decision Making*

1. INTRODUCTION

Making the right career decisions after high school is a stage that should be passed to achieve career success in the world of work as expected. Career decision making can be defined as the process of determining an alternative from several alternative choices related to career choices and exploration. The career decision-making process at the high school level is related to the choice of continuing to. However, making career decisions after graduating from high school is not an easy thing. B M any students experiencing difficulty in making decisions to choose a major in college in accordance with the abilities, interests, and career expectations aspired.

Research conducted by Baiti et al. [1] showed that 62.5% of students had problems in the career field. This is shown by the inability of the subject to make career choices and tend to be confused in carrying out his career goals. Nengsih [2] in his research found that 70% of research subjects had problems in the career field. As a result, the subject is still confused about continuing a career in accordance with his current major or switching to another field.

Bandura (in [3]) argued that in the decision-making process related to career choices, individuals must consider the uncertainty about their ability to their field of interest, the certainty and prospects of their future career and the identity they are looking for. To overcome uncertainty about his abilities, individuals must have confidence in their abilities or what is called self-efficacy (Bandura in [3])

Self-efficacy is basically the result of cognitive processes such as decision, belief, or appreciation of the extent to which individuals estimate the ability of him in performing specific tasks or actions necessary to achieve the desired result [4,5]. Self-efficacy is a belief and sense of success that an individual has based on learning outcomes about his or her ability or competence to direct motivation, cognitive abilities, organize actions, and take necessary actions to carry out tasks, achieve goals, and overcome existing challenges. This belief will affect the ways of socialization that will be carried out as well as the person's perspective on his own quality, good or bad [4,6,7].

Based on the nature of self-efficacy and related to the phenomenon of the student's condition from the previous explanation, it can be concluded that the obstacles

experienced by students in making career decisions are caused by low self-efficacy. The constraints experienced by students during the career decision-making process reflect learning outcomes from the four sources of self-efficacy. Supposedly, if high self-efficacy is embedded in these students, students will be able to make career decisions. Students will see themselves as capable of making career decisions after high school. Students will be more persistent in finding existing information and convince themselves in making career decisions later. This was also explained by [7,8], that decision making can be facilitated or hindered by individual self-efficacy.

Self-efficacy in career decision making was first raised in research by Taylor & Betz (in [9]), where both applied self-efficacy in career decision making. The results showed that low self-efficacy resulted in doubt and insecurity in the ability to complete the tasks needed to decide career choices. In other words, students' confidence in their ability to make career decisions has not yet been formed.

Career decision making self-efficacy can be defined as an individual's belief in carrying out the tasks related to the exploration and career choices [9]. The self-efficacy component of career decision making is related to students' confidence in their ability to perform five tasks, namely, (1) confident in the ability to perform self-assessments, (2) confident in the ability to collect career information, (3) confident in the ability to selecting and determining career direction and goals, (4), belief in ability to make realistic plans for the future, and (5) believe in the ability to solve the problems [1,10,11]. The five components of career decision making self-efficacy are formed and developed through one or a combination of the four sources of self-efficacy. The wrong thinking process towards one or a combination of the four sources will have an impact on the low self-efficacy of student career decision making, and conversely [1,10,11].

One of intervention to resolve the low career decision making self-efficacy is Group Cognitive Behavior Therapy (CBT). The purpose of this CBT group counseling intervention is to provide a place where individuals can maximize their potential in career development through a series of activities such as identifying and modifying dysfunctional beliefs, playing behavioral roles, and recommending doing homework [12,13,14]. CBT is based on the concept of changing thoughts that have an impact on behavior, that is, individuals can make appropriate career decisions [15,16]. Based on the exposure is then researchers interested in conducting research on the effectiveness of cognitive behavior therapy (CBT) group counseling to increase the career decision making self-efficacy of high school students.

The problem in this study is "Is the Cognitive Behavior Therapy (CBT) group counseling effective in improve the career decision making self-efficacy of high school students?". In accordance with the formulation of the problem, the purpose of this study was to determine the effectiveness of Cognitive Behavior Group Counseling to improve career decision making self-efficacy of high school students.

2. METHODS

This research is a quantitative research with a quasi-experimental design. The research design used was the pre-test and post-test control group design. The population in this study amounted to 144 students who were students of class XII SMA Negeri in Singaraja sub-district who had a very low level of career decision making self-efficacy. The sampling technique used in this research is simple random sampling technique. Based on the sampling conducted, it was found that 12 students were used as research subjects. Details of the subjects in this study can be seen in table 1.

Table 1. Research Subjects

Experimental Group				
Student's name	Gender	Age	Score	Category
AA	Women	18 years	87	low
AB	Women	17 years	81	Very low
AC	Male	18 years	78	Very low
AD	Male	18 years	83	Very low
AE	Male	17 years	78	Very low
AF	Male	18 years	84	Very low
A1	Women	18 years	88	low
A2	Women	17 years	87	low
A3	Women	18 years	75	low
A4	Male	18 years	87	Very low
A5	Male	17 years	85	low

There are two types of instruments used in this study, namely: (1) the treatment instrument in the form of the CBT group counseling scenario and (2) the data collection instrument, namely the career decision making

self-efficacy scale. All instruments have been tested for feasibility before they are used in the study. The intervention procedure in this study generally used a process or stage in the CBT group counseling. In

particular, the design of the stages in the CBT group counseling can be seen in table 2.

Table 2. Stages of CBT Group Counseling

Execution time	Step	Activities
3 August 2020	Early stage	Orientation, group exploration and overcoming resistance
4 August 2020	Working Stage	Assessment of negative thoughts, feelings and behavior
5 August 2020		Counseling goal setting
6 August 2020		Discussion of the problem
7 August 2020		Discussion of the problem
9 August 2020	Final Stage	Summary of the counseling process and closure

3. RESULT

The average value of the efficacy of career decision making obtained before being given the CBT group counseling treatment in the experimental group was 81.83 in the category of having a very low career decision-making efficacy level, and after being given treatment the CBT group counseling reached an average career decision-making efficacy score of 170.66 in

category has a very high efficacy of career decision making. Meanwhile, in the control group there were only decreasing changes and there was one person who experienced an increase in the efficacy of career decision making, but was still in the very low category. The average score of the efficacy of career decision making at the pretest was 84.16 and at the posttest it was 82.66 in the very low category. The comparison of the average score can be seen in table 3.

Table 3. Short cut keys for the template

Experimental Group				Control Group		
No.	Name	Post-test Score	Category	Name	Post-test Score	Category
1	AA	183	Very high	A1	85	Low
2	AB	184	Very high	A2	87	Low
3	AC	166	Very high	A3	84	Very low
4	AD	184	Very high	A4	80	Very low
5	AE	134	High	A5	83	Very low
6	AF	173	Very high	A6	77	Very low
	Average	170.66	Very high	Average	82.66	Very low

Analysis of data on hypothesis testers using nonparametric statistical techniques, because the data processed is only a little (<25) so it is considered not using the statistical analysis Test-Mann-Whitney to test the effectiveness of CBT group counseling to increase the self-efficacy of high school student career decision making. The research hypothesis is determined as follows:

H0: If the value of significance or Asymp. Sig (2-tailed) is smaller than 0.05, so Ha is accepted and H0 is rejected.

H1: If the value of significance or Asymp. Sig (2-tailed) is greater than 0.05, so Ha is rejected and H0 is accepted.

The results of statistical tests with the Mann-Whitney Test show the following data:

Table 4. Rank Test-Mann-Whitney

Ranks			
Groups	N	Mean Rank	Sum of Ranks
Experiment Group	6	9.5	57
Control Group	6	3.5	21
	12		

Table 5. Test Statistics *Test-Mann-Whitney*

Test Statistics	
Mann-Whitney U Wilcoxon W	0
Z	21
	-2.892
Asymp. Sig. (2-tailed) Exact Sig. [2*(1-tailed Sig.)]	0.004
	.002 ^b

Based on the output test statistics Test-Mann-Whitney using SPSS for windows version 22.0, the Asymp results are obtained. Sig (2-tailed) of 0.004 is

smaller than < 0.05 . Therefore, as the basis for the Mann-Whitney Test decision making, it can be concluded that H_a is accepted and H_0 is rejected. Thus it can be said that there is a significant difference between the self-efficacy of career decision making in the control group and the experimental group. This can be seen also from the average posttest score in the experimental group which is greater than the average posttest control group which indicates that the CBT group counseling is effective for increasing the self-efficacy of high school student career decision making.

4. DISCUSSION

The discussion focused on findings related to cognitive behavior group counseling to improve high school student career decision-making self-efficacy. In this discussion, CBT Group Counseling is hereinafter abbreviated as CBGC, and Self Efficacy in Career Decision Making abbreviated as. Based on the results obtained from the pretest, it has shown that a group of students tends to have doubts about career decision making in the high category. This means that students in making career decisions still show an attitude of doubt, are anxious in choosing, have too high a level of criteria that are incompatible with their abilities, are less aware of the abilities with which career choices will be chosen, and are afraid to commit to a career choice that will chosen.

Determining successful decisions is easy because individuals must try to overcome uncertainty regarding their capabilities, stability of interests, current and future prospects for alternative choices, career accessibility and the identity they want to develop within oneself (Bandura in [2]). This causes not all teenagers to easily make career decisions and many of them experience doubts before settling on a particular career path. CDMSE plays a very important role for each individual in determining career decisions. CDMSE in this study is basically the result of a cognitive process in the form of decisions, beliefs, or awards about the extent to which individuals estimate their ability to carry out certain tasks or actions needed to achieve the desired results in determining their career decisions [8,11]. A high CDMSE makes it easier for individuals to determine self-assessment, gather information, organize and determine career directions, and solve all problems related to their careers. In fact, a low CDMSE will prevent individuals from making career choices.

The low level of individual CDMSE manifests as difficulties connecting individuals when deciding career choices [8,11]. These difficulties can make individuals give up responsibility in making decisions that make decisions to others or even those who cannot make decisions that take decisions that do not make optimal decisions [8,11]. The results of observations that have been made found that students with low CDMSE tend to

think that they do not have the ability to assess themselves, are unable to collect information needed to determine careers, are unable to select and determine career goals and direction, do not have the ability to plan realistic for future careers, and unable to solve problems related to career choice.

Based on the results of the study, the changes observed in the experimental group, namely from thoughts, feelings and behavior that lead to positive thoughts, feelings, and behaviors in a career, will increase personal awareness related to behavioral awareness carried out through thoughts and feelings, behavior. proper behavior is the result of positive thinking and feeling. CBGC emphasizes on dysfunctional cognitive restructuring. Changes between warming that occur changes that trigger doubtful decision-making problems that arise by students will quickly decrease, so that students can think, act, and act appropriately and can make a steady career [17,18,19].

As for the activities carried out by the experimental group during the CBGC activities, each member first introduced new members who were not previously known. The group leader in this CBGC activity is the counselor. This activity is facilitated by the group leader with one assistant group leader or co - leader. This activity is the initial stage in the CBGC or called the initial stage.

The working stage in the CBGC activities begins with the identification of negative thoughts, feelings and behaviors which begins by providing an identification sheet for negative thoughts, feelings and behaviors experienced in career decision making for all group members. The identification sheet helps group members identify any negative thoughts, feelings and behaviors they have had in planning their careers. The counselor as the group leader also helps group members to identify and describe what the counselor has experienced so far in planning a career. The counselor also explains how behavior is integral to thoughts and feelings. If thoughts and feelings are negative, the behavior that is generated is also negative.

Through the identification of these thoughts, feelings, and behaviors, group members begin to understand what negative thoughts have been in the members so far, and realize that their actions have been dominated by irrational thoughts, especially commitment in career decision making. The basic understanding given by the counselor can provide a stimulus to group members related to analyzing negative thoughts, feelings and behaviors that arise in career decision making. When expressing thoughts, feelings and behaviors experienced so far, group members express their problems. Group members showed that they were able to identify negative thoughts that were observed through one of the members' accounts in the positive and negative thought identification stage "I am afraid that if what I choose will

eventually disappoint my parents, so I prefer to leave the career choice to parents only, this is the most effective and safe. I know that is why I have not made up my mind to make a decision". Based on the understanding and ability of group members to identify negative thoughts, feelings and behavior, this has an impact on self-awareness in career decision-making beliefs.

These findings are in accordance with the cognitive behavior counseling theory which emphasizes that humans have the potential to absorb rational and irrational thinking, where irrational thinking can cause emotional disturbances and deviant behaviour [18,20,21]. Therefore, in this study, the first focus in the CBGC intervention is understanding and correcting the cognition of members who are still irrational.

If it is associated with low, then this happens because the cognitive processes of students are not working properly and are directed in determining the right career choices. Individuals who assess their choices are many and do not understand their potential, so that they cannot combine these choices with their potential, besides that factors outside the individual are also vulnerable in giving influence to students, resulting in individual doubts. in choosing a particular career. Conditions in which individuals feel unstable and doubtful regarding their career choices are basically created by irrational or dysfunctional thoughts. CBGC is based on the concept of changing minds that have an impact on their behavior, namely students can make appropriate career decisions [19].

The second working stage in the CBGC is the setting of counseling goals. After group members are able to identify any negative thoughts, feelings and behaviors that have emerged when making career decisions, then group members begin to determine what goals they want to achieve during the CBGC process related to the problem of the low of group members. This counseling goal setting is necessary so that all group members have specific goals that will be realized in the CBGC process, so that there is a clear limit to the desire related to the problem of the low students.

The findings were that during the CBGC implementation process, group members, through the direction of the group leader, were able to make plans and objectives to be achieved related to the problem of low in the CBGC process. Prior to the implementation of the CBGC, group members already had objectives related to the problem of low, but these goals were still limited to general goals, not specific. Each group member is taught to make specific goals based on the problems experienced. Through the CBGC process, members make general goals more specific, which include aspects of implementing the objectives, how to carry out goals, how to evaluate the level of success of the goals. This is in accordance with the principle of goal-making in cognitive behavior counseling, that the objectives of

counseling must be specific to implement and measure the level of success, identification of goals determines the direction of further counseling [13,20,22, 23]. Although the group leader guides the discussion of objectives and working with members, group members who choose their personal goals. Group members describe the problematic behavior that they want to change and the new skills they want to achieve.

The working stage in the third CBGC is positive self-talk. This stage is the stage of training group members to manage negative thoughts, feelings and behaviors that have been identified to be positive thoughts, feelings and behaviors that can help in making career decisions. During the CBGC intervention process, namely in the positive self-talk section, group members experienced enough difficulties. The group leader gives examples several times, and asks group members to practice doing positive self-talk repeatedly until group members really understand, realize, and feel the impact of positive self-talk on irrational thoughts that have been had in making career decisions, and can shows an attitude of confidence in career decision making.

Stage work (working stage) activity CBGC third at the first meeting overall indicator has not indicated any change in the form of a significant decrease, this is one of them pointed out members of the group are still not fully and appears hesitant in doing speech self-positive that the counsellor has taught. However, at the second meeting, group members began to show that there were changes in the increase, although not all indicators.

This is shown from the self-talk conducted by group members, the negative self-talk that is in the members "I should be able to make my parents happy, and I must not make mistakes in making career decisions, it is better to leave that choice to the parents than to take action. wrong "self-talk was replaced with positive self-talk" Indeed I want to make my parents happy, but I realize that not all things I can do to achieve that, but I will try to make my parents happy by taking concrete steps to decide the direction and Advanced schools that are in accordance with our abilities, seek information related to the advanced schools, because we will never know if we don't do anything, and mistakes in the learning process are normal, right Sir".

The perfectionist attitude that exists in students causes students to hesitate in making career choices, and it is not uncommon for them to avoid or leave choices to parents or some who follow their peers. Before participating in the CBGC activity, the experimental group members thought that everything they do must be as expected, can run ideally. But in reality, not everything can go according to plans and expectations, as well as choosing career options. Sometimes the expected career choice and reality do not go hand in hand, even so students still need to prepare themselves to make career choice planning.

After participating in the CBGC activities, students were taught to change inappropriate cognition into more precise thinking. Students were taught through positive self-talk which was trained on members of the experimental group. Students learn to change perfectionist thoughts and attitudes; everything must go according to plan and be perfect to be more precise thinking.

Meeting of the three-stage positive self-speech, showing all the indicators experienced an increase in the sign if i right, it is observed through a sheet of self-reflection and observation conducted by researchers. Group members are able to reduce perfectionist thinking, self-consciousness, fear of commitment, anxiety in making decisions, and the level of ego identity manifested through positive self-talk by group members. At this third meeting, group members are better able to manage their negative thoughts and replace them with more rational or positive thoughts. Group members are more fluent in conducting positive self-talk, and appear more stable and confident in the words conveyed. In addition to the findings of the researchers, group members after conducting positive self-talk were immediately balanced with positive actions that had never been done so far.

The process of changing from low to high is in accordance with the behavioristic theory that behavior is the result of formation, that behaviour is learned through repeated habituation. Thorndike in Bandura (in [24]) behaviouristic learning theory regarding the law of training, that the more often a behavior is repeated or trained, the stronger the association will be. The same behavior and repeated display can become a habit. This means that something that is repeated and learned will internalize in the person of the person.

On the one hand, the control group was very different from the experimental group. The results of the post-test carried out, the control group did not experience a significant increase from the pretest results. That is, there was no increase in the control group. In addition, control group members also still have doubts in making career decisions, are anxious, fearful, and are not sure of their abilities so that there is no increase in the control group.

Based on the average results obtained from the pretest-posttest in the experimental group which have been discussed in chapter 4 showing a significant increase in from members of the experimental group, it can be concluded that CBGC is effective for improving of high school students. The acceptance of the hypothesis in this study is supported by accurate results from the results of the analysis which show a difference in the mean value of the experimental group, namely a sharp increase compared to the control group which did not experience an increase in. Thus, it can be concluded that the use of CBGC effectively increases the of high school students.

The results of this study are in line with the research of [13,14,16,25,26,27,28] which shows that cognitive behavioural counseling can be used as an intervention for individual problems that are rooted in misconceptions of thinking or dysfunctional thoughts. Previous research has shown the individual thinking errors lead to various other problems such as insecurity, not being independent, anxiety and even doubt in making choices or decisions. Cognitive counseling that is packaged through group settings and individual settings is carried out based on the counselee's cognitive restructuring of his dysfunctional thoughts [13,22,26]. Cognitive restructuring is carried out on the idea that each individual has the cognitive structure that should be, and dysfunctional thoughts are thoughts that are not in the proper structure. Through the stages in cognitive behavioral counseling, counsees are taught to restructure the mind again to be able to think well and positively [13,22,26].

This study used a pretest-posttest control group design so that the process of implementing the counseling from start to finish has limitations in observing each situation of each individual. This makes it less optimal to describe the changes of each counselee in the group. For further research, it can be done using a single subject design, so that the observation and discussion of the counselee in the group will be more detailed. In addition, the measurement and assessment of changes in the counselee's was carried out only once. This is considered inaccurate considering the evaluation of counseling, including the results and impacts of each treatment given. For further research, it is recommended to use continuous assessment and measurements such as the Time Series to be able to see the impact of the interventions that have been given so that the results and assessments obtained will be more accurate.

5. CONCLUSION

Based on the result of this study, it can be concluded that behavioral group counseling (CBGC) can improves career decision making self-efficacy (CDMSE) of high school student. This result is supported by accurate analysis results which show a difference in the mean value of the experimental group, there is a sharp increase in CSDMSE compared to the control group that did not experience an increase in CDMSE. CBGC through its implementation stages can effectively identify dysfunctional thoughts experienced by the counselee. Dysfunctional thoughts experienced by the counselee are the root of the problem of the counselee's low EDPKK which causes the counselee's inability to determine career direction. The counselee's dysfunctional thoughts can be modified through cognitive-behavioral counseling in a group setting. Changes in dysfunctional thoughts that the counselee has also improves counselee's CDMSE.

REFERENCES

- [1] R. D. Baiti, S. M. Abdullah, and N. S. Rochwidowati, Career Self-Efficacy Dan Kesiapan Kerja Pada Mahasiswa Semester Akhir, *Jurnal Psikologi Integratif* 5(2) (2017) 128–141. DOI: <https://doi.org/doi.org/10.14421/jpsi.2017.%25x>
- [2] Nengsih, Pengaruh Self Efficacy Terhadap Perencanaan Arah Karier Siswa Sma Dan Implikasinya Dalam Pelayanan Bimbingan Konseling, *Al-Irsyad: Jurnal Pendidikan Dan Konseling*, 9(1) (2019) 55–68.
- [3] F. Arlinkasari, Z. kmal, Hubungan antara School Engagement, Academic Self-Efficacy dan Academic Burnout pada Mahasiswa, *Jurnal Umanitas* 1(2) (2017) 81–102. DOI: <https://doi.org/doi.org/10.28932/humanitas.v1i2.418>
- [4] J. Choi, J. H. Lee, B. Kim, How does learner-centered education affect teacher self-efficacy? The case of project-based learning in Korea. *Teaching and Teacher Education* 85 (2019) 45–57. DOI: <https://doi.org/10.1016/j.tate.2019.05.005>
- [5] J. Soland, Modeling academic achievement and self-efficacy as joint developmental processes: Evidence for education, counseling, and policy, *Journal of Applied Developmental Psychology* 65(December 2019) 101076. DOI: <https://doi.org/10.1016/j.appdev.2019.101076>
- [6] N. Chuang, P. C. Lee, L. Kwok, Leisure , Sport & Tourism Education Assisting students with career decision-making difficulties : Can career decision-making self-efficacy and career decision-making profile help ? *Journal of Hospitality, Leisure, Sport & Tourism Education* 26(May 2020) 100235. DOI: <https://doi.org/10.1016/j.jhlste.2019.100235>
- [7] Y. Li, T. Huo, K. Zhuang, L. Song, X. Wang, Z. Ren, Q. Liu, and J. Qiu, J, Functional connectivity mediates the relationship between self-efficacy and curiosity, *Neuroscience Letters* 711(August) (2019) 134442. DOI: <https://doi.org/10.1016/j.neulet.2019.134442>
- [8] L. Musculus, M. Raab, P. Belling, B. Lobinger, Linking self-efficacy and decision-making processes in developing soccer players, *Psychology of Sport and Exercise* 39 (2018) 72–80. DOI: <https://doi.org/10.1016/j.psychsport.2018.07.008>
- [9] J. Fan, The role of thinking styles in career decision-making self-efficacy among university students, *Thinking Skills and Creativity* 20 (2016) 63–73. DOI: <https://doi.org/10.1016/j.tsc.2016.03.001>
- [10] H. Bozgeyikli, H. Hamurcu, Career Decision Making Self-Efficacy, Career Maturity And Socioeconomic Status With Turkish Youth, *Journal of Education Science and Psychology* 1(1) (2019) 15–24.
- [11] A. Santos, W. Wang, J. Lewis, Emotional intelligence and career decision-making difficulties: The mediating role of career decision self-efficacy, *Journal of Vocational Behavior* 107 (2018) 295–309. DOI: <https://doi.org/10.1016/j.jvb.2018.05.008>
- [12] S. Han, Y. Hu, H. Lu, L. Zhang, Z. Zhu, J. Luo, M. V. Relf, M. I. Mulawa, Y. Pei, and B. Wu, Cognitive behavioral therapy for persons living with HIV in China: A randomized pilot trial, *Journal of Affective Disorders* 277(August) (2020) 640–648. DOI: <https://doi.org/10.1016/j.jad.2020.08.085>
- [13] M. Lemos, J. P. Román-Calderón, J. Restrepo, J. F. Gómez-Hoyos, and C. M. Jimenez, Cognitive behavioral therapy reduces illness perceptions and anxiety symptoms in patients with unruptured intracranial aneurysm, *Journal of Clinical Neuroscience* 80 (2020) 56–62. DOI: <https://doi.org/10.1016/j.jocn.2020.07.071>
- [14] J. Luu, M. Millard, J. Newby, H. Haskelberg, M. J. Hobbs, and A. E. J. Mahoney, Internet-based cognitive behavioural therapy for treating symptoms of obsessive compulsive disorder in routine care, *Journal of Obsessive-Compulsive and Related Disorders* 26(July) (2020) 100561. DOI: <https://doi.org/10.1016/j.jocrd.2020.100561>
- [15] D. Bakker, N. Kazantzis, D. Rickwood, N. Rickard, Development and Pilot Evaluation of Smartphone-Delivered Cognitive Behavior Therapy Strategies for Mood- and Anxiety-Related Problems: MoodMission, *Cognitive and Behavioral Practice*, 25(4) (2018) 496–514. DOI: <https://doi.org/10.1016/j.cbpra.2018.07.002>
- [16] N. Choque Olsson, P. Juth, E. Högberg Ragnarsson, T. Lundgren, M. Jansson-Fröjmark, T. Parling, Treatment satisfaction with cognitive-behavioral therapy among children and adolescents with anxiety and depression: A systematic review and meta-synthesis, *Journal of Behavioral and Cognitive Therapy*, 2020. DOI: <https://doi.org/10.1016/j.jbct.2020.10.006>
- [17] R. M. Butler, E. B. O’Day, M. B. Swee, A. Horenstein, R. G. Heimberg, Cognitive Behavioral Therapy for Social Anxiety Disorder: Predictors of Treatment Outcome in a Quasi-Naturalistic Setting, *Behavior Therapy*, 2020. DOI: <https://doi.org/10.1016/j.beth.2020.06.002>
- [18] P. D. Mankiewicz, Cognitive Restructuring and Graded Behavioral Exposure for Persecutory

- Paranoia and Agoraphobic Anxiety in Complex Psychosis, *Clinical Case Studies* 18(2) (2019) 143–158. <https://doi.org/10.1177/1534650119826713>
- [19] T. S. S. Rao, S. Kakar, Integrating Cognitive Restructuring Within Psychodynamic Therapy for Erectile Dysfunction, *Journal of Psychosexual Health* 1(3–4) (2019) 277–279. DOI: <https://doi.org/10.1177/2631831819894175>
- [20] C. L. Benjamin, C. M. Puleo, C. A. Settipani, D. M. Brodman, J. M. Edmunds, C. M. Cummings, and P. C. Kendall, History of cognitive-behavioral therapy in youth, *Child and Adolescent Psychiatric Clinics of North America* 20(2) (2011) 179–189. DOI: <https://doi.org/10.1016/j.chc.2011.01.011>
- [21] A. Ekejiuba, A. D. Nnachetam, O. B. Akukananwa, O. Bernadeth, Effect Of Cognitive Restructuring Technique On Fear Tendency Among Secondary School Students In Owerri Municipal Council Of Imo State, *International Journal of Advanced Research and Publications* 2(1) (2018) 34–38.
- [22] J. S. Beck, *Cognitive Behavior Therapy: Basics and Beyond*, In The Guilford Press, 2011. DOI: <https://doi.org/10.1017/CBO9781107415324.004>
- [23] R. W. Lent, G. W. Ireland, L. T. Penn, T. R. Morris, R. Sappington, Sources of self-efficacy and outcome expectations for career exploration and decision-making: A test of the social cognitive model of career self-management, *Journal of Vocational Behavior* 99 (2017) 107–117. DOI: <https://doi.org/10.1016/j.jvb.2017.01.002>
- [24] M. Zhang, K. Ogata, From hidden to visible: A unified framework for transforming behavioral theories into rewrite theories, *Theoretical Computer Science* 722 (2018) 52–75. DOI: <https://doi.org/10.1016/j.tcs.2018.01.006>
- [25] Fatmawati, Stang, S. Palutturi, R. Amiruddin, M. Syafar, Development of cognitive behavior therapy apps application on depression management in patients of diabetes mellitus type II, *Enfermeria Clinica* 30 (2020) 21–27. DOI: <https://doi.org/10.1016/j.enfcli.2019.11.017>
- [26] M. Orvati Aziz, S. A. Mehrinejad, K. Hashemian, M. Paivastegar, Integrative therapy (short-term psychodynamic psychotherapy & cognitive-behavioral therapy) and cognitive-behavioral therapy in the treatment of generalized anxiety disorder: A randomized controlled trial, *Complementary Therapies in Clinical Practice*, 39 (September 2020). DOI: <https://doi.org/10.1016/j.ctcp.2020.101122>
- [27] A. Sweetman, S. Putland, L. Lack, R. D. Mcevoy, R. Adams, R Grunstein, N. Stocks, B. Kaambwa, E. V. Ryswyk, A. Vakulin, N. Lovato, The effect of cognitive behavioural therapy for insomnia on sedative-hypnotic use: A narrative review, *Sleep Medicine Reviews* (2020) 101404. DOI: <https://doi.org/10.1016/j.smrv.2020.101404>
- [28] I. Urits, J. Callan, M. Student, W. C. Moore, M. Student, M. C. Fuller, M. Student, J. S. Renschler, M. Student, P. Fisher, J. W. Jung, M. Student, J. Hasoon, J. Eskander, A. D. Kaye, and O. Viswanath, Best Practice & Research Clinical Anaesthesiology Cognitive behavioral therapy for the treatment of chronic pelvic pain, *Best Practice & Research Clinical Anaesthesiology* 34(3) (2020) 409–426. DOI: <https://doi.org/10.1016/j.bpa.2020.08.001>
- [9] A. Pnueli, In transition from global to modular temporal reasoning about programs, in: K.R. Apt (Ed.), *Logics and Models of Concurrent Systems*, Springer, Berlin, Heidelberg, 1984, pp. 123–144. DOI: https://doi.org/10.1007/978-3-642-82453-1_5
- [10] B. Meyer, Applying "Design by Contract", *Computer* 25(10) (1992) 40–51. DOI: <https://doi.org/10.1109/2.161279>
- [11] S. Bensalem, M. Bogza, A. Legay, T.H. Nguyen, J. Sifakis, R. Yan, Incremental component-based construction and verification using invariants, in: *Proceedings of the Conference on Formal Methods in Computer Aided Design (FMCAD)*, IEEE Press, Piscataway, NJ, 2010, pp. 257–256.
- [12] H. Barringer, C.S. Pasareanu, D. Giannakopoulou, Proof rules for automated compositional verification through learning, in *Proc. of the 2nd International Workshop on Specification and Verification of Component Based Systems*, 2003.
- [13] M.G. Bobaru, C.S. Pasareanu, D. Giannakopoulou, Automated assume-guarantee reasoning by abstraction refinement, in: A. Gupta, S. Malik (Eds.), *Proceedings of the Computer Aided Verification*, Springer, Berlin, Heidelberg, 2008, pp. 135–148. DOI: https://doi.org/10.1007/978-3-540-70545-1_14