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Programa de Pós-Graduação em Psiquiatria e Saúde Mental

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DISERTAÇÃO DE MESTRADO

Tratamento de Transtornos de Ansiedade associados ao uso abusivo de computador, internet e telefone celular.

Dissertação de mestrado apresentada ao Programa de Pós-Graduação de Psiquiatria e Saúde Mental, da Universidade Federal do Rio de Janeiro, como parte dos requisitos necessários. à obtenção do título de Mestre em Saúde Mental.

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A todos os profissionais que se dedicam
a promover saúde, bem estar e
qualidade de vida que desempenham
suas funções por amor ao desenvolvimento e
aprimoramento do ser humano como um todo.

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Que venha o Doutorado!

Sumário

LISTA DE ABREVIATURAS, SÍMBOLOS E SIGLAS:

IAT- *Internet Addiction Test*

MINI- Entrevista Diagnóstica Neuropsiquiátrica Estruturada DSM

HAM-A – Escala Hamilton de Ansiedade

HAM-D - Escala Hamilton de Depressão

CGI-S - *Clinical Global Impression- Severity*

CGI-I – *Clinical Global Impresssion- Improvement*

DSM-5 – *Diagnostic and Statistical Manual of mental Disorders- Fifth edition*

TAG- Transtorno de Ansiedade Generalizada

TOC- Transtorno Obsessivo-Compulsivo

TP- Transtorno de Pânico

DI- Dependência de Internet

TCC- Terapia Cognitivo Comportamental

IPUB – Instituto de Psiquiatria

UFRJ – Universidade Federal do Rio de Janeiro

RESUMO:

A internet revolucionou o mundo e as relações produzindo mudanças significativas e se tornando parte integrante da sociedade moderna fornecendo aos seus usuários inúmeras facilidades e benefícios, mas seu uso excessivo evoca uma dependência potencial e grave prejuízo na vida social, acadêmica, financeira, psicológica e ocupacional. Dependentes de internet geralmente apresentam comorbidades psiquiátricas tais como transtornos ansiosos e depressão. Esse estudo levanta a importância da pesquisa em saúde no tocante à dependência de internet e ao elevado e crescente número de comorbidades psiquiátricas, principalmente dos transtornos ansiosos, avaliando a relação da ansiedade com a dependência de internet e desenvolvendo um protocolo de tratamento para dependência de internet e transtornos ansiosos utilizando terapia cognitivo-comportamental. Foram realizadas revisão de literatura e pesquisas de campo durante 18 meses. Os instrumentos utilizados foram a MINI 5.0, IAT, HAM-A, HAM-D, CGI-S e CGI-I. Essa dissertação é composta de quatro artigos, dois publicados e dois submetidos, que abordam questões em discussão pela comunidade científica. O primeiro artigo é uma revisão da literatura sobre o papel da emoção positiva no tratamento da depressão. O segundo apresenta um relato de caso do tratamento de uma paciente com transtorno de pânico, transtorno obsessivo-compulsivo e dependência de internet. O terceiro artigo é um ensaio clínico descrevendo o atendimento de 84 pacientes sendo 42 com transtornos de ansiedade e dependência de internet e 42 com dependência de internet. O quarto artigo é um estudo longitudinal descrevendo o protocolo de atendimento de 39 pacientes com transtorno de pânico ou transtorno de ansiedade generalizada e dependência de internet. O primeiro artigo aborda a inserção da emoção positiva como estratégia de tratamento para a depressão. Os outros três artigos desenvolvidos abordam aspectos clínicos dos transtornos de ansiedade e do uso abusivo de internet, computador e telefone celular propondo um protocolo de tratamento e estudando a relação da ansiedade e do uso abusivo das tecnologias. Os estudos apresentados nesta dissertação ressaltam a relação entre transtornos de ansiedade e dependência de internet (0,724) e verifica que o protocolo de atendimento desenvolvido foi eficaz para tratar a ansiedade e a dependência de internet, uma vez que todos os pacientes aprenderam a manejar a ansiedade fora da internet e apresentaram comportamento de uso consciente da mesma ao final do atendimento.

Palavras-chave: Ansiedade, Dependência de internet, Terapia Cognitivo-Comportamental.

ABSTRACT:

The rapid growth of the Internet has provided great changes in our daily experience, becoming an integral part of modern life. The facilities and the innumerous possibilities of the Internet are considerable benefits but excessive use has brought about the potential for addiction and caused impairments in social, academic, financial, psychological and work domains. Internet addicts usually have comorbid psychiatric disorders as anxiety disorders or depression. This study raises the importance of health research regarding internet addiction and the large and growing number of psychiatric comorbidities, mainly of anxious disorders, assessing the relationship of anxiety with the internet addiction and developing a treatment protocol for internet addiction and anxious disorders using cognitive behavioral therapy. We conducted literature review, case report, clinical trial and a longitudinal research during 18 months. The instruments used were the MINI 5.0, IAT, HAM-A, HAM-D and CGI. This dissertation consists of four articles, two already published and two to be published that address issues under discussion by the scientific community. The first article is a review of the literature on the role of positive emotion in the treatment of depression. The second presents a case report of treating a patient with panic disorder, obsessive-compulsive disorder and internet addiction. The third paper is a clinical trial describing the attendance of 84 patients being 42 with anxiety disorders and internet addiction and 42 with internet addiction. The fourth article is a longitudinal study describing the treatment Protocol of 39 patients with panic disorder or generalized anxiety disorder and internet addiction. The first article discusses the positive emotion as a strategy of treatment for depression. The other three articles developed address clinical aspects of anxiety disorders and the abusive use of internet, computer and cell phone offering a treatment protocol and studying the relationship of anxiety and abuse of the technologies. The studies presented in this dissertation emphasize the relationship between anxiety and internet addiction (0.724) and verifies that the treatment protocol developed was effective to treat anxiety and internet addiction, once all the patients have learned to handle the anxiety out of the internet and presented behavior of conscious use at the end of the treatment.

Keywords: anxiety, internet addiction, cognitive-behavioral therapy.

INTRODUÇÃO

Nossa sociedade hoje vive mergulhada em tecnologia. Informação, conhecimento, música, filmes, jogos, compras e outros estão disponíveis a qualquer momento do dia ou da noite. As interações sociais passam por uma revolução onde a conexão ocorre ininterruptamente e vivenciamos mudanças em todas as estruturas sociais e consequentemente em nosso comportamento. Muitos usuários tornam-se dependentes quando a utilização da internet promove evitação da vida real provocando prejuízo em esferas como relacionamentos, trabalho, saúde e desempenho acadêmico. Analisar as mudanças comportamentais e as interações sociais produzidas pelo uso abusivo de internet, computador e telefone celular se torna uma necessidade atual.

Como objetivo geral, a presente dissertação visa produzir maior escopo de conhecimento sobre a dependência de internet em termos de conceitualização, avaliação, diagnóstico e tratamento, além de ressaltar a relação entre a ansiedade e a dependência de internet (DI) promovendo e divulgando o uso consciente de tecnologias.

Os objetivos específicos dessa dissertação são apresentar dados científicos sobre transtornos de ansiedade associados ao uso abusivo de internet, computador e telefone celular desenvolvendo protocolo de tratamento combinado de medicação e terapia cognitivo comportamental (TCC) modificada.

A justificativa da presente dissertação é demonstrar a relação e a influência da ansiedade no uso abusivo da internet, computador e telefone celular tendo como hipótese o fato de que indivíduos com transtornos de ansiedade como transtorno de pânico, agorafobia, transtorno de ansiedade generalizada, fobia social e específica apresentarão maior prevalência e gravidade no uso abusivo e dependência de internet, computador e telefone celular do que indivíduos sem transtornos de ansiedade.

O desenvolvimento das sociedades é permeado por avanços tecnológicos que possibilitam o surgimento de recursos como a *World Wide Web*, a internet.

A internet tornou-se poderoso meio de comunicação e intermedia grande parte das interações profissionais, acadêmicas ou pessoais. No Brasil, a Internet tem se tornado cada vez mais presente nos lares, recente pesquisa da Ibope Nielsen Online aponta a existência de 120,3 milhões de brasileiros com acesso à internet[1]. Embora a internet tenha trazido inúmeras facilidades e benefícios seu uso excessivo vem provocando graves prejuízos sociais, acadêmicos, profissionais, psicológicos e financeiros denunciando o surgimento de um problema de saúde mental, a dependência de Internet. [2,3]

Distúrbios psicológicos como solidão, insônia, baixa autoestima, dificuldade em resolução de problemas, *déficit* em habilidades sociais, ansiedade, estresse e depressão estão associados à dependência de internet. [2,4,5] O comportamento agressivo também pode ser relacionado ao excessivo uso de internet.[6] Dependente de Internet experimentam maiores níveis de prazer na Web que na vida real.[7]

A dependência de internet não é um transtorno reconhecido pelo DSM5[8] que incluiu a dependência de jogos *on line* ou no computador (*internet gaming disorder*) em seu apêndice como estudo para futuras edições. Em função disso, tanto os critérios diagnósticos quanto os instrumentos para avaliação da dependência de internet são diversos e geram polêmicas. Dentre os critérios diagnósticos propostos para dependência de internet os mais usados são: preocupação excessiva com a internet, necessidade de aumentar o tempo conectado, esforços repetitivos, sem sucesso, reduzir o tempo de uso, agitação, irritabilidade e/ou depressão quando tenta reduzir o uso, ficar online mais tempo do que pretendia, prejuízo em relações significativas, emprego ou educação, mentir a respeito do envolvimento com a Internet, usar a internet como forma de escapar de problemas e/ou como regulação emocional. [9]

Um estudo recente de revisão apresenta prevalência de dependência de internet variando de 1,0% a 18,7% em diversos países alegando que além das diferenças culturais, diferentes instrumentos de acesso utilizados dificultam uma padronização e identificação de prevalência real do transtorno. Dentre as escalas mais utilizadas e validadas encontramos: Teste de Dependência de

Internet (IAT), *Compulsive Internet Use Scale* (CIUS), *Internet Addiction Proneness Scale* (KS scale), *Chen Internet Addition Scale* (CIAS). [10]

Muitos autores consideram a dependência de internet como um transtorno de controle de impulsos [2,7,9,11,12,13,14] em função do foco em gratificações imediatas e da inabilidade em resistir ao impulso de executar algo danoso para si ou para terceiros. Um estudo chileno[15] de DI entre estudantes de medicina aponta associação com depressão e transtornos de ansiedade e ressalta o uso da internet como válvula de escape para aliviar ansiedade.

A dependência de internet tem despertado o interesse da psiquiatria especialmente pelo fato de diversos estudos sugerirem uma comorbidade com transtornos psiquiátricos como depressão, [16,17,18,19,20,21,22,23] transtorno de déficit de atenção e hiperatividade,[16,24,25,26,27] hipomania,[28] transtorno de ansiedade generalizada, transtorno de ansiedade social, [21,26] distimia,[26] abuso de álcool,[28] transtornos alimentares,[29] transtorno de personalidade obsessivo compulsivo, transtorno de personalidade borderline,[26] fobia social[16,28,30] e insônia.[31]

Vários estudos sugerem que tanto tratamentos medicamentosos quanto psicoterápicos são indicados isoladamente ou conjuntamente para o tratamento da dependência de internet. Nos tratamentos medicamentosos, medicações como: escitalopram, citalopram, bupropiona, olanzapina, quetiapina, naltrexona, metilfenidato e memantina têm sido utilizados para dependência de internet. [32]

A TCC tem sido apontada como abordagem psicoterápica eficaz para o tratamento de dependência de internet. O argumento principal da TCC é fazer o paciente entender e observar a estreita relação entre pensamento, sentimento e comportamento. Os pacientes são treinados para identificar através de seus pensamentos e sentimentos, os gatilhos dos comportamentos de dependência. Outros objetivos de TCC são promover a adesão ao tratamento e a prevenção de recaídas. O treinamento em habilidades sociais, terapia de realidade e a entrevista motivacional também são abordagens utilizadas com os dependentes de internet. [32]

Os tratamentos psicoterápicos com TCC utilizam estratégias como psicoeducação para o reconhecimento dos benefícios e prejuízos da internet, gerenciamento de tempo, identificação dos pensamentos disfuncionais que levam ao comportamento aditivo, restruturação cognitiva, estratégias de resolução de problemas e comunicação interpessoal, treinamento em respiração, trabalhar com metas, cartões de enfrentamentos etc.[33, 34,35]

METODOLOGIA

Na revisão sistemática os artigos foram selecionados nas bases *ISI Web of Knowledge, PubMed e PsycINFO* em Setembro de 2013 sem restrição em nenhuma base utilizando os termos "*positive psychology*", "*emotion*" e "*depression*". Foram encontrados 3400 artigos nas três bases. Após a retirada dos duplicados restaram 3084 artigos. Nesse momento 3006 artigos foram excluídos pela análise do título e do resumo restando 78 artigos que foram lidos e analisados na íntegra. Após a análise 28 artigos foram incluídos na revisão sistemática. Dos 28 artigos descritos nove são ensaios clínicos randomizados, 9 estudos de coorte prospectivo, sete estudos observacionais transversais e três estudo de caso controle. Os seguintes dados foram extraídos dos artigos e descritos na revisão sistemática: tamanho da amostra, características dos participantes, tipo de intervenção, escalas de bem-estar, depressão, ansiedade e outras utilizadas, além de informações sobre métodos e resultados. Esses procedimentos foram executados por dois investigadores independentes.

No relato de caso, descrevemos o atendimento de uma paciente de 24 anos com transtorno de pânico, agorafobia, TOC e dependência de internet que recebeu tratamento medicamentoso com clonazepam e sertralina e psicoterapia por dez semanas. Avaliamos a ansiedade, a depressão e o uso de internet e telefone celular e atividades sociais antes e depois da psicoterapia e a paciente apresentou melhora dos sintomas de TOC, transtorno do pânico e agorafobia, diminuiu bastante o uso de internet deixando de ser dependente grave de internet para ser usuária mediana e conseguiu retomar sua vida social e ocupacional que estavam bastante prejudicadas.

Nos ensaios clínicos abertos todos os pacientes assinaram termo de consentimento e foram atendidos no Laboratório de Pânico e Respiração no Instituto de Psiquiatria da UFRJ. 84 pacientes que procuravam tratamento para transtornos de ansiedade e DI foram selecionados e responderam ao MINI, HAM-A, HAM-D, IAT, CGI-S e CGI-I. Os pacientes que só tinham DI receberam psicoeducação e biblioterapia e foram considerados como grupo sem comorbidades enquanto que os pacientes com DI e transtornos de ansiedade receberam medicação e psicoterapia por dez semanas. Os critérios de inclusão adotados para o estudo foram pacientes entre 18 e 65 anos, com dependência de internet e transtorno de ansiedade possuindo suficiente capacidade cognitiva de entender instruções. Os pacientes que não sabiam ler ou escrever, ou tinham patologia do eixo II, foram excluídos.

No último ensaio clínico aberto 39 pacientes com transtorno do pânico e ou transtorno de ansiedade generalizada e dependência de internet que procuravam tratamento foram selecionados e responderam ao MINI, HAM-A, HAM-D, IAT, CGI-S e CGI-I. Todos os participantes assinaram termo de consentimento e foram atendidos no Laboratório de Pânico e Respiração no Instituto de Psiquiatria da UFRJ. 25 pacientes foram diagnosticados com DI e TP e 14 com TAG e DI. Os psiquiatras prescreveram medicamentos para tratar o TP ou TAG e a DI e foram encaminhados para a psicoterapia durante dez semanas. Os pacientes foram avaliados por psiquiatra no momento inicial e foram acompanhados durante tratamento. O protocolo de psicoterapia utilizado nos atendimentos está descrito abaixo.

O protocolo desenvolvido para tratamento leva em consideração o uso consciente de tecnologias e o fato de que existe um transtorno de ansiedade primário que reforça e agrava o uso abusivo da internet, portanto o objetivo do mesmo é tratar o transtorno de ansiedade e estabelecer um uso saudável da internet.

A primeira etapa do tratamento é dirigida ao tratamento do transtorno de ansiedade e psicoeducação do mecanismo da ansiedade, ensinando ao paciente a não ter medo em situações que geram ansiedade. Neste momento os pacientes identificam e compreendem as emoções e o seu funcionamento e

esta relação com a utilização da internet. Todas as situações circunstanciais são exploradas: vida social, relações interpessoais, ocupacionais situações relacionadas à ansiedade e ao uso da internet.

A segunda fase é de reavaliação cognitiva do uso de ansiedade e internet, através do qual os pacientes analisam seu uso diário da internet, as cognições e "gatilhos" envolvidos no uso da internet e ansiedade. As distorções cognitivas como abstração seletiva, generalização, pensamento de dicotomia que perpetuam a ansiedade e o uso excessivo da internet são reestruturadas. Neste momento, os pacientes compreender a influência dos pensamentos sobre comportamentos.

A terceira fase é a modificação comportamental que envolve quebrar hábitos no uso da internet e criar diferentes usos. São realizadas as exposições de situações ansiogênicas e o gerenciamento do tempo. A modificação comportamental abrange áreas sociais, interpessoais e mudanças maneiras de lidar com amigos, família e, atividades físicas. Nesta fase, outro objetivo é inserir emoção positiva na vida do paciente para aumentar a motivação para o desenvolvimento de habilidades sociais para as interações reais.

A última fase do tratamento é a prevenção de recaída através de análise de conquistas, reforçando novas crenças e comportamentos e trabalhando estratégias de resolução de problemas. Este tratamento dura em torno de dez sessões.

RESULTADOS

A presente dissertação teve como resultados das pesquisas realizadas, a apresentação dos artigos publicados e submetidos ao longo do período de mestrado.

No primeiro artigo intitulado "*The Role of Positive Emotion and Contributions of Positive Psychology in Depression Treatment: Systematic Review*" publicado em 2013 no *Clinical Practice & Epidemiology in Mental Health*, realizamos uma revisão da literatura sobre o papel da emoção positiva e contribuições da Psicologia Positiva no tratamento da depressão. O artigo apresenta importante relação entre humor e emoção positiva, bem como uma significativa melhora nos sintomas da depressão utilizando diferentes estratégias da psicologia positiva. Nesse momento o foco da pesquisa era avaliar estratégias para o desenvolvimento de protocolo de tratamento para depressão.

No segundo artigo o foco já era voltado para o atendimento de transtornos de ansiedade e dependência de internet, o artigo intitulado "*Treatment of Internet Addiction in Patient with Panic Disorder and Obsessive Compulsive Disorder: A Case Report*" publicado em 2015 no *CNS & Neurological Disorders - Drug Targets* descrevemos um relato de caso de atendimento de uma paciente com transtorno de pânico, transtorno obsessivo compulsivo e dependência de internet utilizando medicação (sertralina e clonazepam) e TCC durante 10 semanas. A paciente apresentou melhoras significativas tanto no TP e no TOC quanto na DI sugerindo que o tratamento foi eficaz.

O terceiro artigo "*Treatment outcomes in patients with internet addiction and anxiety*" foi submetido à publicação no jornal *Addiction* e relata dois ensaios clínicos abertos. Um estudo registra o resultado do tratamento medicamentoso e psicoterápico oferecido a 42 pacientes com transtornos de ansiedade e dependência de internet e o outro o efeito da psicoeducação e biblioterapia em 42 pacientes com dependência de internet. O estudo ressalta a relação da ansiedade e da DI e os resultados mostraram que o tratamento foi eficaz

reduzindo os sintomas de ansiedade e promovendo o uso consciente da internet.

O quarto artigo intitulado "*A Protocol for Internet Addiction with Anxiety Disorders*" foi submetido à publicação no *Psychiatry Research* e relata um ensaio clinico aberto onde 39 pacientes com transtorno de pânico ou transtorno de ansiedade generalizada e dependência de internet foram acompanhados por 10 semanas de tratamento. O artigo descreve o protocolo de tratamento psicoterápico e reforça a relação da ansiedade e DI apresentando resultados eficazes no tratamento dos transtornos ansiosos e na DI.

A seguir, encontram-se listadas as referências dos artigos publicados resultante dos estudos durante o mestrado:

1) Santos V, Paes F, Pereira V, Arias-Carrión O, Silva A, Carta MG, Nardi AE, Machado S. The Role of Positive Emotion and Contributions of Positive Psychology in Depression Treatment: Systematic Review. Clinical Practice & Epidemiology in Mental Health, 2013; 9: 221-237.

2) Santos V, Nardi AE, King AL. Treatment of Internet Addiction in Patient with Panic Disorder and Obsessive Compulsive Disorder: A Case Report. CNS & Neurological Disorders - Drug Targets, 2015; 14(3): 341-4.

Artigos submetidos em periódicos para publicação:

3) Santos V, Freire R, Zugliani M, Cirillo P, Santos HH, Nardi AE, King AL. Treatment outcomes in patients with internet addiction and anxiety. (Submetido no Addiction em 01/07/2015).

4) Santos V, Freire R, Zugliani M, Cirillo P, Santos HH, Nardi AE, King AL. A Protocol for Internet Addiction with Anxiety Disorders. (Submetido no Psychiatry Research em 15/07/2015)

Artigo 1

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Clinical Practice & Epidemiology in Mental Health, 2013, *9*, 221-237

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The Role of Positive Emotion and Contributions of Positive Psychology in Depression Treatment: Systematic Review

Veruska Santos[1,*], Flavia Paes[1], Valeska Pereira[1], Oscar Arias-Carrión[2], Adriana Cardoso Silva[1], Mauro Giovanni Carta[6], Antonio Egidio Nardi[1] and Sergio Machado[1,3,4,5]

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Abstract: The present study aims to conduct a systematic review of the literature by checking the impact of positive emotion in the treatment of depression and on the use of strategies of positive psychology which involves positive emotion to treat and reduce symptoms of depression. For this purpose, we conducted searches in databases ISI Web of Knowledge, PsycINFO and PubMed and found a total of 3400 studies. After inclusion application and exclusion criteria, 28 articles remained, presented and discussed in this study. The studies have important relations between humor and positive emotion as well as a significant improvement in signs and symptoms of depression using differents strategies of positive psychology. Another relevant aspect is the preventative character of the proposed interventions by positive psychology by the fact that increase well-being and produce elements such as resilience and coping resources that reduce the recurrent relapses in the treatment of depression. The strategies of positive psychology, such as increasing positive emotions, develop personal strengths: seeking direction, meaning and engagement for the day-to-day life of the patients, appear as potentially tools for the prophylaxis and treatment of depression, helping to reduce signs and symptoms as well as for prevention of relapses.

Keywords: Depression, emotion, positive psychology, resilience.

INTRODUCTION

Positive psychology is a psychological approach targeted to emphasize people skills and to promote their cognitive functioning, physical and emotional health. Martin Seligman, American psychologist, established in January 1998 the conceptual basis of positive psychology at the time he assumed the presidency of the American Psychological Association (APA). Seligman [1] stressed the fact that psychology needed to study also the human qualities and not only the weaknesses and illnesses. The focus of clinical psychology intervention was mental illness, understanding and how to reduce the signs and symptoms associated to psychiatric disorders. According to Wood and Tarrier [2] prior to the event of positive psychology the negative aspects of life were taken into consideration and the positive aspects were disregarded. These authors don't suggest the study of positive functioning as a separate field of clinical psychology, but rather that clinical psychology itself changes to become a more integrative discipline.

Seligman, Steen, Parks & Peterson [3] point out that positive psychology emphasizes the study of positive emotion, the personal strengths and skills of the human being, as wel as the positive institutions, which are institutions that allow the experience and expression of positive emotions such as the familiy and the community to enhance mental health and promote wellness. According to Sin & Lyubormirsky [4], extending the positive emotion in daily life of patients is one of the main goals of positive psychology. Positive emotions as joy, gratitude, serenity, interest, hope, pride, amusement, inspiration, awe and love play a central role in the treatment and can function as a kind of protection against stress and depression. [5-8] pointed the importance of positive emotions on psychological well-being. [9-12] have shown that positive automatic thoughts and optimistic style of thinking also offers protection against depression and are indicators of happiness and well-being.

[6, 13-15] pointed an important aspect studied by positive psychology: resilience and how to make people more resilient in when facing adversity. Resilience refers to the

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capacity for successful adaptation or change in the face of adversity. Studies suggest several ways to achieve this goal. These authors noted the importance of developing resilience to manage depression and that it is supported by social support, affective ties and expansion of positive emotions. [10] stressed the role of positive cognitive triad in the development of resilience in life satisfaction and depression and reinforcing the positive cognitions are important factors to promote resiliency and well-being.

Positive psychology has been used to treat various mental disorders. In the treatment of depression, a model intervention was developed by Seligman, Rashid & Parks [16] and they called it positive psychotherapy (PPT), aiming to increase objective and subjective welfare, positive emotion, positive behaviors and cognitions. [17] highlight the strategies of positive psychology are generating positive coping resources that alleviate depression and reduce their relapses.

Thus, the present study aims to conduct a systematic review of the literature on the impact of positive emotion in the treatment of depression and on the use of positive psychology strategies that involves positive emotion to treat and reduce symptoms of depression.

METHODOLOGY

Eligibility criteria

The methodology of this study will follow the PRISMA model (*Preferred Reporting Items for Systematic reviews and Meta-Analyses*) for the determination of eligibility.

1- Type of studies - The studies were randomized clinical trials, prospective cohort studies, cross-sectional observational studies and case-control studies in order to generate evidence regarding the effects and the impact of positive emotion in the treatment of depression;

2- Type of participants - no limitation of age, young women with depression or not;

3- Types of intervention - positive psychology strategies or emotion in evaluating patients with depression or not. Some articles compared these interventions to controlled groups by the symptoms of depression and the scores of depression scales.

4- Types of measures - depression, anxiety, mood, well-being, personality, quality of life, positive and negative affect, gratitude, hope, stress, resilience, life satisfaction, self-esteem, automatic thoughts, happiness, meaning, mindfulness were analyzed by using of specific scales.

Sources of information

The articles included in this study were selected in searches in the database ISI Web of Knowledge, PubMed and PsycINFO in September 2013, without restriction in any of the databases. From own references found in the electronic databases, it was also performed a manual search.

Search

All searches in databases used the terms "positive psychology", "emotion" and "depression".

Selection of studies

The selection of the studies was carried out by two independent authors, which in case of divergences have sought a consensus on the selection. The evaluation consisted in the filtering of the studies, from the analysis of the title, followed by summary and analysis after the full article. In need to solve possible disagreements between the two experts, a third evaluator was requested for the due order. Complete relevant articles were obtained and evaluated with inclusion and exclusion criteria, described below.

Search of Data

The following data was extracted from the articles: sample size, characteristics of participants, type of intervention, scales used, measurements of hope, happiness, well-being, depression, anxiety and others and meaningful main results. In addition to these, several other information about methods and results were collected. These procedures were performed by two independent investigators have reached a consensus in the case of divergence.

Exclusion Criteria

The articles that used interventions not associated with emotion, population with mental diseases differing from depression, specific samples composed of children, neurological disease, those who do not have detailed the procedure applied, or did not present results of variables emotion and humor.

Risk of Bias in Studies

For the assessment of risk of bias of each item included it was analyzed: the presence of eligibility criteria for participants of the sample; the random allocation of participants, the results of all times from the analysis of more than 85% of the sample, the presence of the control group, presentation of results and the variability of the results inter groups.

The flowdiagram is shown below (Fig. **1**).

RESULTS

The categorization of the studies included in this study is presented below in accordance to the design of the studies (Table **1** and **2**).

CROSS-SECTIONAL OBSERVATIONAL STUDIES

Cross-sectional observational studies were found in 7 articles. In the first, [18] investigated the relationship between personality, mood and memory. 62 individuals participated in three sessions where they were asked to encode adjectives that described themselves or not, for that, subjects heard a recording with 39 adjectives and on a sheet of paper where this 39 adjectives were written and followed by meanings, the subjects were asked to circulated if the adjective heard described themselves. The next moment, they were asked to recall many adjectives as they could in two minutes and write down as many of the adjectives as possible. After the recall task the participants were asked to fill out the following questionnaires: a short 18-item Profile of Mood States [19], Tension/ Anxiety (POMS T); Depression (POMS D) and Vigor (POMS V); State and Trait versions of the State

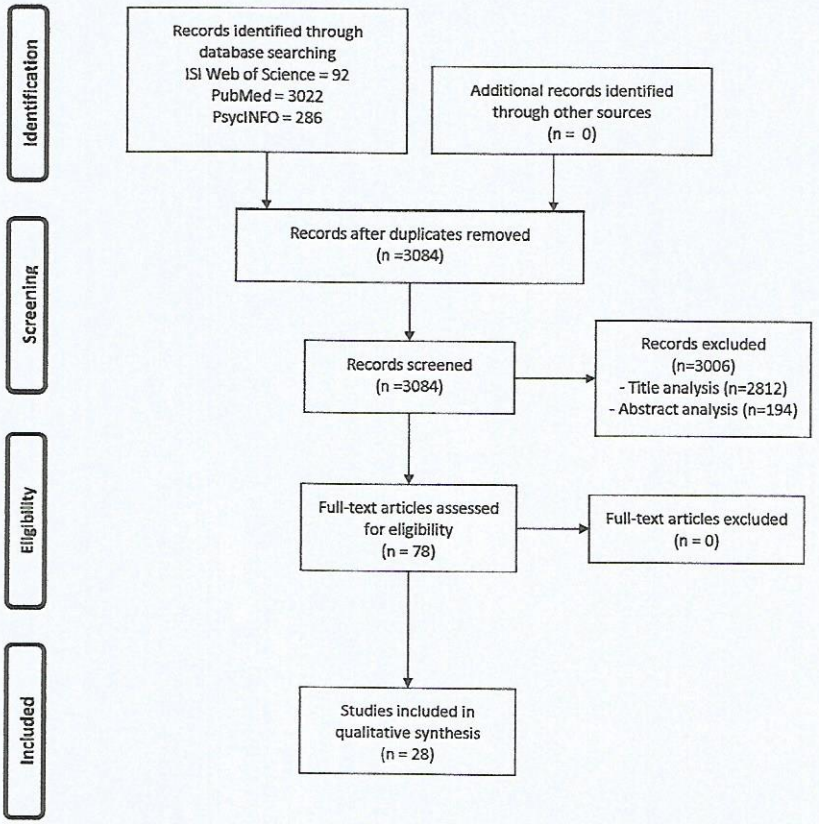

Fig. (1). Flow diagram of selected studies.

Table 1. Summary of Prospective Cohort, Cross-Sectional Observational and Case-Control Studies on the Role of Positive Emotion and Contributions of Positive Psychology in Depression Treatment

Authors	Objective	N	Design	Main Results
Lewin-sohn,PM;Libet,J.	Investigate the relationship between humor and pleas-ant activities.	30	Prospective cohort study	Three groups of 10 subjects (depression, psychiatric and control) during 30 consecutive days engaged in enjoyable activities and measured their mood. The results showed a significant association between pleasant activities and mood state suggesting a clinical utility.
Lightsey,O.R.	Evaluate if automatic posi-tive thoughts could function as protective factors to stress and depression.	152	Prospective cohort study	The results confirmed the hypothesis that automatic positive thoughts are predictors of happiness and higher frequency of them was associated with greater future happiness. This findings suggests that positive automatic thoughts had an impact on immediate and on future well-being alleviating depression.
Kuppens,P Nezlek,J.B,	Examine how subjects regulated their emotions in daily life and how this affected their emotional experiences and their psy-chological adjustment.	153	Prospective cohort study	Over the course of three weeks participants described as they had adjusted the emotion in terms of reassessment or inhibition of positive and negative emotions. The results showed that the reappraisal situations to increase positive emotions was positively related to self-esteem, psychologi-cal adjustment and positive affect, in contrast, supressing the expression of positive emotions was associated with decreased self-esteem, decreased psychological adjustment and increased negative emotions. These analyses suggested that positive and negative emotion played diferentes roles in mediating the psychologycal adjustment and self-esteem.

Table 1. contd....

Authors	Objective	N	Design	Main Results
Saw-yer,M.G;Pfeiffer,S; Spence,S.H.	Investigate the impacts of positive and negative man-agement strategies and optimistic thinking style in depressive symptoms.	5634	Prospective cohort study	The results showed that teens who made greater use of negative coping strategies and less use of positive coping strategies and optimistic thinking were at increased risk for higher levels of depressive symptoms. This findings suggest that negative life events and negative coping strategies precede and likely contribute to the onset of depressive symptoms while positive coping strategies and optimistic thinking may have a protective effect against depression.
Wenze,S.J.; Gunthert,K,. & Forand,N.R.	Analize the relationship between cognitive reactivity (relationship between thought and mood) and depression.	63	Prospective cohort study	The results pointed out that cognitive reactivity remained predictive of follow-up depressive symtom scores ($p<0.05$) and accounted for 6.1% of the variance in follow-up depres-sive symptom. Dysfunctional atitudes were predictive of follow-up depressive symptom, controlling for initial de-pressive symptom ($p= 0.06$) and account for 5.5% of the variance in folow-up depressive symptoms. Cognitive reac-tivity was somewhat more predictive of follow-up depres-sive symptom scores in participants who had experienced high levels of life stress. This results indicate that cognitive reactivity serves as a risk fator for the development of de-pressive symtoms.
Mauss,I.B.; Shall-cross,A.J;Troy,A.S.; John,O.P.; Ferrer,E.; Wilhelm,F.H. Gross,J.J.	Examine whether dissocia-tion between positive emo-tion experience and behav-iors predicts two facets of psychological functioning-depressive symptoms and well-being- and if so, wether these effects are mediated by social connectedness.	135	Prospective cohort study	The results showed that positive experience-behavior disso-ciation predicted social connectedness ($p<0.05$); social connectedness was negatively associated with depressive symptoms ($p<0.05$) and positively associated with well-being ($p<0.05$). This study showed that the more partici-pants positive experience and behaviors were dissociated during a positive emotion induction, the greater levels of depressive symptoms and the lower levels of well-being participants experienced six months later.
Shankman,S.A.; Klein,D.N.; Tor-pey,D.C.; Olino,T.M.; Dyson,M.W; Kim,J; Durbin,E.; Nel-son,B.D.& Tenke,C.E.	Assess if high negative emotionality (sadness, fear, anger) and low positive emotionality (anhedonia, lack of enthusiasm, lack of energy) in children are risk factors for developing de-pression.	329	Prospective cohort study	The results showed that both low positive emotionality and high negative emotionality are suficient for confering risk for depression. Using EEG asymmetry as a marker for depres-sion, the direction of interaction suggests that children with low positive emotionality or high negative emotionality are at risk for depression and children with both temperamental traits are not a greater risk than those with only one.
Catalino,L.I & Fredrickson,B.L.	Evaluate whether and how routine activity promote flourishing - a state of op-timal mental health.	208	Prospective cohort study	Comparing florishers to depressed and non florishers the authors discovered that flourishers respond more positively to pleasant activities, ranging from interacting to learning. The analysis pointed out important differences in florishers individuals in positive emotionality that modify signifi-cantly the capabilities of coping and feeling of well being and that the maintenance of this blossoming is the impor-tance given to ordinary everyday experiences as, for exam-ple, chat with a colleague, helping, interacting, playing, learning, spiritual activity and exercising.
Gruber,J.; Kogan,A.; Quoidbach,J.; & Mauss,I.B.	Examine the Psychological health correlates of positive emotion variability versus stability.	$N^1$244 N^2 2391	Prospective cohort study	In Study 1 participants who experienced greater positive emotion variability throughout the 14 day period reported worse Psychological health including decreased life satis-faction and increased depression and anxiety($ps< 0.05$). In study 2 participants who reported greater positive emotion variability throughout the previous day reported worse Psychological health and decreased daily and life satisfac-tion and subjective happiness.($ps<0.01$).

Table 1. contd....

Authors	Objective	N	Design	Main Results
Bradley,B.P. & Mogg,K.	Ascertain the relationship between personality, mood and memory.	62	Cross-sectional observational study	The results showed a tendency to remember negative information in subjects with depressive mood and personality vulnerabilities.
Lawton,M,P,Winter, L, Kleban,M.H,Ruckdeschel,K	Determine the contribution of objective and subjective quality of life as positive and negative indicators of mental health in a sample of people of the third age.	602	Cross-sectional observational study	The senior-center subjects were more depressed, had less contact with relatives and had lower activity participantion than housing residentes, but other model elements were not diferent. The study demonstrated that participation in objective activities, the quality of friendships and family are associated with positive affection and that quality time is associated with both positive affect and depression.
Dowrick,C, Kokanovic,R,Hegarty,K, Griffiths,F, Gunn,J	Verifie the importance of developing resilience to handle depression in 100 depressive subjects met in emergency services of hospitals in Australia.	100	Cross-sectional observational study	One-third of the subjects developed sustained resilience by personal resources consisting of internal forces and another third of the sample sustained their resilience in the expansion of positive emotions. The personal resilience appears to be important in patients with experience of depressive symptoms in primary care.
Wood,A.M.;Maltby,J ; Gillett,R; Linley,P.A.&Joseph,S	Analyze the role of gratitude in the perception of social support, stress and depression.	$N^1$156 N^2 87 N=243	Cross-sectional observational study	The results confirmed that the gratitude leads to well-being and social support above the effects of Big Five. It suggests a role for gratitude in well-being and social life protecting people from stress and depression even under the effects of the dimensions given in the personality test.
Liu,Q; Shono,M; Kitamura,T.	investigate the relationship between psychological well-being with depression and anxiety.	545	Cross-sectional observational study	The analysis of the results pointed out that people with greater psychological well-being are more resilient and more resistant to adversity that people with low levels of psychological well-being. In this way, this study could provide an useful implication for clinical work in psychotherapy on well-being promotion to prevent and treat depression and anxiety.
Vranceanu,A-M; Gallo,L.C.& Bogart,L.M.	Evaluate the association between personal experiences, the fleeting affections and depressive symptoms in women	108	Cross-sectional observational study	Women with higher levels of depression reported greater negative affect, less positive affect and more interpersonally conflictive interactions across two days of diary monitoring. According to the authors, social interations are strong contributors to the relationship between depressive symptoms and affect suggesting that interpersonal functioning as a key fator in etiology and maintenance of depression.
Mak,W.W., Ng,I.S.W. & Wong,C.C.Y.	Estabilish the role of positive cognitive triad in the development of resilience in life satisfaction and depression in a sample of 1419 university students in Hong Kong.	1419	Cross-sectional observational study	The study revealed that positive cognitions are important factors that contribute to the effect of trait resilience on well-being. Educators and psychologists may consider cognitive mechanisms to promote resiliency and well-being.
Alloy,LB, Crocker,J, Kayne,NT	Check whether there would be differences in perceptions of consensus for positive, negative and neutral events in depressive and non-depressive and the effects of these interpretations both on attributive style and on levels of depression.	52	Case-control study	The depression is not affected by the perception of others but by the perceptions of the self that have a direct association with depression and an effect mediated through attributional style for negative events. The authors pointed out the importance for the development of prevention and treatment strategies to determinate the causes of a depressive attributional style.

Table 1. contd....

Authors	Objective	N	Design	Main Results
Shee-ber,L.B;Allen,N.B; Leve,C; Davis,B; Shortt,J,W; Katz,L,F.	Delineate the dimensions of affective experience in depressive disorder in adolescents. The affect regulation involved in initiating, maintaining and moduling the occurence, intensity and duration of the experience.	152	Case-control study	The depressed adolescents didn't maintain happy affective states for as long a time as the healthy ones ($p<0.01$) . The authors highlight the deficit of maintenance of positive affect and the longer duration of physiological responses associated with negative affect as a critical mechanism in depression.
Levens,S.M & Gotlib,I.H.	Verify whether depressed participants were also impaired at selecting relevant positive content in the context of representations in working memory (WM) such an impairment would limit depressed person's ability to use positive material to ameliorate the cognitive effects of negative information.	42	Case-control study	The results presented that for the nondepressed participants, interferences levels differed significantly across conditions ($p<0.001$) and this participants exhibited lower levels of interference in the emotion focus condition in the neutral and the emotion nonfocus conditions ($p<0.001$). For the depressed group levels did not differ across conditions ($p>0.05$) and this participants exhibited higher interference levels than did their nondepressed peers in the emotion focus condition ($p<0.01$). Nondepressed participants showed less interference for positive than for neutral information and depressed subjects showed equivalent levels of interference for positive and neutral stimuli.

Legend: ANEW: Battery of English Words of Affective Contents; BDI: Beck Depression Inventory; BDI - II: Beck Depression Inventory II; BAI: Beck Anxiety Inventory; CES-D: Center for Epidemiological Studies - Depression Measure; DAS: Dysfunctional Attitudes Scale; DRM: Day Reconstruction Method; EAT: The Computerized Edinburgh Associative Thesaurus; EES: Elevating Experience Scale; ERM: Ego-Resilience Measure; ESM: Computerized Experience-Sampling-Method; HS: Hope Scale; Life: Structure Card-Sorting Task; LOT: Life Orientation Test; MAS: Mindfulness and Awareness Scale; MS: Meaning Scale; PANAS: Positive Affect and Negative Affect; PWB: Psychological Well-Being Scale; SBI: Savoring Beliefs Inventory; SCID-I: Structured Clinical Interview for DSM IV-TR Axis I Disorders; SES: Self- Esteem Scale; SH I: Steen Happiness Index; STAI: Spielberger State-Trait Anxiety Inventory; SVS: Subjective Vitality Scale; SWLS: Satisfaction With Life Scale; VIA-IS: Values in Action Inventory of Strengths

Table 2. Summary of Randomized Control Trials Studies on The Role of Positive Emotion and Contributions of Positive Psychology in Depression Treatment

Authors	Objctive	N	Delineation	Results
Beck, J.T., Strong, S.R. (1982)	Check the effect of the communication of the therapist on the symptoms of depressive patients.	30	Randomized Clinical Trial	Depressed subjects were given brief therapy with positive connotations and interpretations, with negative connotations and a control group. Although all groups decreased depressive symptoms, the group that received negative interpretations did not continue treatment while receiving positive interpretation persisted in the treatment and have remitted the symptoms. The scales used were: BDI Scale, Personal Mood Inventory and Barrett-Lennard's Relashionship Inventory. The degree of significance of personal impression was $p< 0,001$ of controllability was $p< 0,005$, expectation for change was $p< 0,05$ and $p< 0,01$. In the inventory of relationships the p was$< 0,05$ and the only dimension that presented variation was the resistance with $p< 0,005$. In the BDI the p was$< 0,005$ and$< 0,001$. The significance between treatment and duration time and between the positive and negative connotations presented $p< 0,05$.
Joormann *et al.* (2005)	Evaluate the ability to intentionally forget negative material between depressive and non-depressive.	72	Randomized Clinical Trial	Depressive participants could forget the negative responses and the more they practiced the intentional forgetting of negative material less basic items they resembled on the final test. Used the BDI-II ($P>0,10$ for the depressed group and $p>0,50$ for not depressed) and the Battery of English Words of Affective Contents. The practice of suppressing negative words by depressed presented $p< 0,025$ and the memory of the words from the baseline $p<0,03$ for all groups.

Table 2. contd....

Authors	Objctive	N	Delineation	Results
Seligman *et al.* (2005)	Test of positive psychology interventions to increase happiness using five different strategies and a control strategy.	577	Randomized Clinical Trial	The survey tested if some exercises were effective to decrease depression. To measure the happiness and depression the study used the CES-D and the SHI. At least three of the strategies were effective in increasing individual happiness and reduction of depressive symptoms. For the effects of happiness scores by time and by the interaction found a $p< 0,001$ and depression scores the significance for the time and to the interaction $p< 0,001$.
Seligman, M.; Rashid, T., Parks, A.C. (2006)	Demonstrate the effectiveness of positive psychotherapy in the treatment of depression.	$N^1 = 40$ $N^2 = 32$	Randomized Clinical Trial	Positive psychotherapy ia used in the treatment of depression by increasing the positive emotion, engagement and meaning. Two groups: one with average to moderate depression and another with a high degree of depression were referred to the positive Psychotherapy and both treatment groups produced decreased levels of depression. The scales that they valued such results were: BDI ($p> 0,003$ to depressive and $p> 0,05$ for control) and SWLS ($P >0,001$)
Fredrickson *et al.* (2008)	Check the theory that positive emotions lived repeatedly build personal resources to health.	139	Randomized Clinical Trial	The subjects practiced meditation and produced an increase of positive emotions and as a result of the personal resources which in turn increased life satisfaction and decreased depressive symptoms. MAS Scales, HS, SBI, LOT, ERM, Ryff's PWB, SWLS and CES-D, were used. The relationship between time and meditation presented $p<0,0001$ and the relationship with the positive emotion had $p= 0,05$.
Huta, V. & Hawley, L. (2010)	Investigate the relationship between psychological forces and cognitive vulnerabilities to study its effects on well-being.	N^1 241 N^2 54 N=295	Randomized Clinical Trial	Both in the study with healthy subjects and with depressive ones, the relationship between forces and vulnerabilities is clear, but not listed as mere opposites on a continuum. But both affect well-being. The scales used in the study were VIA-IS, DAS, BDI-II, SWLS, PANAS, SES, SVS, MS, EES. The p in all scales was $p< 0,01$.
Bylsma, L.M.; Taylor-Clift, A. & Rottenberg, J. (2011)	Analyze the relationship of positive emotional reactivity and negative emotional reactivity to everyday events into three groups- with major depression, with minor depression and healthy.	99	Randomized Clinical Trial	The depresssives have a higher reactivity to daily events enjoyable and less reactivity to unpleasant daily events. Emphasizes also the role of the assessment of the events and the severity of depression in emotional reactivity. The measurements were carried out through the following instruments: BDI-II, BAI, DRM and ESM. Both the BDI-II as the BAI showed $p< 0,001$. Pleasant and unpleasant activities on DRM and the ESM presented $p<0,05$.
Albarracin, D. & Hart, W. (2011)	Examine the relationship of action and inaction and humor.	N^1 87 $N^2$139 N^3 81 $N^4$140 N=447	Randomized Clinical Trial	Through four experiments the mood of participants was manipulated to be positive, neutral and negative in terms of variables such as general actions, inactions and neutral concepts. The results showed that positive affect and action concepts produced similar effects in increasing behavioral activity and better performance than concepts of inaction and negative affect.The instruments used were: write about an experience very happy or very frustrating, the Computerized Edinburg Associative Thesaurus , verbal and intellectual ability. The relationship between positive, neutral and negative mood and action and inaction presented $p= 0,04$.
Dalgleish *et al.* (2011)	Relate the number of depressive episodes in interpreting the life structure information for the past and the future in groups with and without depression.	50	Randomized Clinical Trial	The data showed a depressive profile relative to the past with predominance of negative information and vulnerability in depressive group and in participants at remission, but surprisingly the groups showed no significant differences in ratings of life structure for the future. The scales used were SCID, Life-Structure Card-Sorting Task, BDI, STAI and PANAS. The BDI, the STAI and PANAS had $p< 0,005$.

ANEW: Battery of English Words of Affective Contents; BDI: Beck Depression Inventory; BDI - II: Beck Depression Inventory II; BAI: Beck Anxiety Inventory; CES-D: Center for Epidemiological Studies - Depression Measure; DAS: Dysfunctional Attitudes Scale; DRM: Day Reconstruction Method; EAT: The Computerized Edinburgh Associative Thesaurus; EES: Elevating Experience Scale; ERM: Ego-Resilience Measure; ESM: Computerized Experience-Sampling-Method; HS: Hope Scale; Life: Structure Card-Sorting Task; LOT: Life Orientation Test; MAS: Mindfulness and Awareness Scale; MS: Meaning Scale; PANAS: Positive Affect and Negative Affect; PWB: Psychological Well-Being Scale; SBI: Savoring Beliefs Inventory; SCID-I: Structured Clinical Interview for DSM IV-TR Axis I Disorders; SES: Self- Esteem Scale; SH I: Steen Happiness Index; STAI: Spielberger State-Trait Anxiety Inventory; SVS: Subjective Vitality Scale; SWLS: Satisfaction With Life Scale; VIA-IS: Values in Action Inventory of Strengths

Trait Anxiety inventory (STAI - [20]); The Beck Depression Inventory (BDI; [21]) and The Eysenck Personality Questionnaire (EPQ; [22]) wich comprises Neuroticism, Extraversion, Psychoticism and Lie Scales. The results showed a tendency to remember negative information in subjects with depressive mood and personality vulnerabilities.

Lawton *et al.* [23] evaluated the contribution of objective quality of life (measured by amount of external social development indicators) and subjective (personal judgment of satisfaction) with aspects of development as positive and negative indicators of mental health in 602 elderly subjects from senior-center and several housing environments volunteeres who responded to the Philadelphia Geriatric Center Multilevel Assessment Instrument (MAI; Lawton, Moss, Fulcomer & Kleban; [24]). To measure objective quality of life (OQOL) the composites indices of MAI relating familiy contact, friends contact and activity participation such as religious attendance, movies, playing cards, eating out or gardening were included. Subjective quality of life (SQOL) was measured by family quality (how much do your relatives make you feel loved and cared for?) by the time quality with interviews about daily aspects of their lives with such questions: How often you want your day to be shorter? Almost everthing I do each day is enjoyable (The ajusted goodness-of-fit-index (AGFI; [25]). The senior-center subjects were more depressed, had less contact with relatives and had lower activity participantion than housing residentes, but other model elements were not diferent. The study demonstrated that participation in objective activities, the quality of friendships and family are associated with positive affection and that quality time is associated with both positive affect and depression.

Dowrick *et al.* [13] verified the importance of developing resilience to handle depression in 100 depressive subjects met in emergency services of hospitals in Australia. After the emergency care, subjects responded to semi-structured telephone interviews – CATI (Computer Assisted Telephone Interview), lasting an hour, held by phone that addressed participation in depressive experiences, views of the causes of stress, ways to manage depression and stress, social support and health service use. The article focused on the answers given to three specific questions: when did you first realize that you had a depressive stress process or concern and what did you firstly decide to do? Is there anything else that you have tried to do to minimize depression, stress or concern? All that was attempted, what was the most useful? The authors assesed how respondents rate personal resilience when comparing to help received from professional sources. The analysis of the responses claimed that one-third of the subjects presented evidence of resilience supported by social and affective ties. One-third of the subjects developed sustained resilience by personal resources consisting of internal forces and another third of the sample sustained their resilience in the expansion of positive emotions. The personal resilience appears to be important in patients with experience of depressive symptoms in primary care.

Wood *et al.* [8] analyzed the role of gratitude in the perception of social support, stress and depression through two studies. In the first study 156 students responded to The Gratitude Questionnaire-6 (GQ-6; [26]) and Social Support sub-scale of the college student version of the Interpersonal Support Evaluation List (; [27]) and underwent tests as The Center for Epidemiological Studies Depression Scale (CES-D; [28]) and The Perceived Stress Scale (PSS; Cohen & Williamson; [29]). The results showed that gratitude lead to improving levels of social support, promotes lower levels of stress and depression over time. In study two, 87 students have completed the same tests and questionnaires from the study one, plus The Big Five Personality Inventory (BFI; [30]). The results confirmed that the gratitude leads to well-being and social support above the effects of Big Five. It suggests a role for gratitude in well-being and social life protecting people from stress and depression even under the effects of the dimensions given in the personality test.

Liu, Shono & Kitamura [15] conducted a study to investigate the relationship between psychological well-being with depression and anxiety. 545 Japanese University students responded to Subjective Well-Being Scale of Ryff's (SPWB- [31]) and The Hospital Anxiety and Depression Scale (HADS- [32]). All six dimensions of the scales of Psychological Well-being Inventory (Autonomy - AU, Environment Mastery - EM, Personal growth- PG, Positive relationships with others- PR, Purpose of life - PL and Self-acceptance - AS) were moderately negatively correlated with depression and anxiety. The analysis of the results pointed out that people with greater psychological well-being are more resilient and more resistant to adversity that people with low levels of psychological well-being. In this way, this study could provide a useful implication for clinical work in psychotherapy on well-being promotion to prevent and treat depression and anxiety.

In another study, [33] evaluated the association between personal experiences, the fleeting affections and depressive symptoms in women, for that, it was used Ecological Momentary Assessment (EMA-[34]), The Center for Epidemiologic Study of Depression Scale (CES-D; [28]) and handheld computer containing a diary 39 likert-type scale items assessing affect, and the nature of the current or most recent social interaction derived from the Diary of Ambulatory Behavioral States to test the associations among depressive symptoms, social experiences and momentary affect in 108 women that were recruited for two consecutive days of registration on a portable computer their social interactions, their emotional experiences and their depressive symptoms, 50 in 50 minutes, from the time they woke up until the time of sleep. The participants answered questions about mood on their social interactions. Women with higher levels of depression reported greater negative affect, less positive affect and more interpersonally conflictive interactions across two days of diary monitoring. According to the authors, social interactions are strong contributors to the relationship between depressive symptoms and it affects suggesting that interpersonal functioning is a factor key in etiology and maintenance of depression.

Mak, Ng & Wong [10] investigated the role of positive cognitive triad in the development of resilience in life satisfaction and depression in a sample of 1419 university students in Hong Kong. The subjects responded to the following on line tests: The Ego-Resilience Scale [35]; The Chinese version of 10-item Rosemberg Self-Esteem Scale [36];

The 10 item View of the World Scale a Subscale of The Cognitive Triad Inventory [37]; The six- item State Hope Scale [38]; Satisfaction With Life Scale (SWLS; [39]) and The Beck Depression Scale II (BDI-II; [40]) where they were analyzed levels of resilience, vision of themselves, vision of the world, vision of future, life satisfaction and depression. The study revealed that positive cognitions are important factors that contribute to the effect of trait resilience on well-being. Educators and psychologists may consider cognitive mechanisms to promote resiliency and well-being.

PROSPECTIVE COHORT STUDIES

The first prospective cohort study was conducted by Lewinsohn & Libet [41], in order to investigate the relationship between humor and pleasant activities. 30 students were divided into three groups of ten components each. A group was composed of depression, another with anxious disorders or other disorders different from depression and a control group. The participants aswered The Pleasant Events Schedule [42] choosed one of the 320 events or activities to engage and at the end of the day, the students indicated in wich activity they had been engaged and their humor was evaluated through The Depression Adjective Check List [43]. The subjects were followed for 30 consecutive days and the study showed a significant association between pleasant activities and mood state suggesting a clinical utility to identify a small number of important activities which are related to the patient's mood state.

Lightsey [9] evaluated if automatic positive thoughts could function as protective factors to stress and depression. 152 volunteers underwent two testing sessions, one at the beginning of the research and another six weeks later. The testing used was The Beck Depression Scale (BDI; [21]), Automatic Thoughts Questionnaire - Positive (ATQP; [44]), Automatic Thoughts Questionnaire (Hollon & Kendall [45]), Life Experience Survey (LES; [46]),The Hassles Scale (HS; [47]) and Happiness Measures (HM; [48]). The interval of six weeks provided the occurrence of stress in the daily life of individuals. The subjects returned for a new follow-up testing three months after. The results confirmed the hypothesis that automatic positive thoughts are predictors of happiness and higher frequency of them was associated with greater future happiness. These findings suggest that positive automatic thoughts had an impact on current and on future well-being. In view of these findings, clinical treatment would focus on increasing patients' positive automatic thoughts which may help to increase happiness and reducing negative automatic toughts may be important for alleviating depression.

Nezlek & Kuppens [49] examined how 153 subjects regulated their emotions in daily life and how this affected their emotional experiences and their psychological adjustment. For three weeks the participants described as they had adjusted their emotions in terms of reappraisal (consists of changing the interpretation of the situation to lessen the emotional impact) or supression (consists of inhibit external reactions of feelings) of positive and negative emotions and qualified as reevaluating or suppressing the emotional experience according to the model proposed by Gross and John [50] using the following items for reappraisal: "When I try to feel more or less positive emotions I change what I'm thinking about..." and for deletion: "When I feel positive or negative emotion I take care not to express...". Self-esteem was measured by Rosemberg Self-Esteem Scale [36] and its psychological adjustment in accordance with Beck's cognitive triad for depression of vision of itself, and future sight. The results showed that the reappraisal situations to increase positive emotions was positively related to self-esteem, psychological adjustment and positive affect, in contrast, supressing the expression of positive emotions was associated with decreased self-esteem, decreased psychological adjustment and increased negative emotions. These analyses suggested that positive and negative emotion played diferentes roles in mediating the psychologycal adjustment and self-esteem.

Sawyer, Pfeiffer & Spence [11] accompanied 5089 teenagers for one year to investigate the impacts of positive and negative management strategies (ways how people react in the face of situations, behavioral aspect) and optimistic thinking style in depressive symptoms (cognitive aspect). So, it was used the following instruments: The Center for Epidemiological Studies Depression Scale (CES-D; [28]); List of Threatening Experiences Questionnaire (LTE-Q; [51]); Social Problem Solving Inventory – Revised (SIPS-R; [52]); The Self Reporting Coping Scale (SRCS; [53]) and Optimistic Thinking Style ("Beyondblue Schools Research Initiative" [54]). The results showed that teens who made greater use of negative coping strategies and less use of positive coping strategies and optimistic thinking were at increased risk for higher levels of depressive symptoms. These findings suggest that negative life events and negative coping strategies precede and likely contribute to the onset of depressive symptoms while positive coping strategies and optimistic thinking may have a protective effect against depression.

Wenze, Gunthert & Forand [55] investigated the relationship between cognitive reactivity (relationship between thought and mood) and depression. 63 students of Psychology replied to tests: The Center for Epidemiological Studies Depression Scale (CES-D; [28]), The Dysfunctional Attitudes Scale (DAS; Weissman & Beck [56]), Positive And Negative Affect Scale-Expanded Form (PANAS-X; [57]) and Automatic Thoughts Questionnaire (ATQ: [45]). After testing the subjects, during a week, four times a day their mood and thoughts registered on a handheld computer. Six months after, the depressive symptoms were again measured and the participants completed a measure of negative life events: The College Student Life Events Schedule (Sandler & Lakey [58]). The results pointed out that cognitive reactivity remained predictive of follow-up depressive symtom scores ($p<0.05$) and accounted for 6.1% of the variance in follow-up depressive symptom. Dysfunctional atitudes were predictive of follow-up depressive symptom, controlling for initial depressive symptom ($p= 0.06$) and account for 5.5% of the variance in folow-up depressive symptoms. Cognitive reactivity was somewhat more predictive of follow-up depressive symptom scores in participants who had experienced high levels of life stress. These results indicate that cognitive reactivity serves as a risk fator for the development of depressive symtoms.

Shankman *et al.* [59] assessed if high negative emotionality (sadness, fear, anger) and low positive emotionality (anhedonia, lack of enthusiasm, lack of energy) in children are risk factors for developing depression. The sample of 329 pre-school children was observed in the laboratory in 12 sessions with selected episodes to mention relevant behaviors removed from Laboratory Temperament Assesssment Battery (LAB-TAB; [60]) and taxes on EEG were performed in specific environment. The results showed that both low positive emotionality and high negative emotionality are suficient for confering risk for depression. Using EEG asymmetry as a marker for depression, the direction of interaction suggests that children with low positive emotionality or high negative emotionality are at risk for depression and children with both temperamental traits are not a greater risk than those with only one. The authors indicated that these temperamental traits may be good targets for preventative strategies.

Catalino & Fredrickson [14] investigated whether and how routine activity promote flourishing - a state of optimal mental health. The authors claim that flourishers experience greater positive emotional reactivity to pleasant events and buid more resources over time. To test how positive emotional reactivity in routine activities can promote mental health the authors recruited 208 subjects to during five consecutive weeks respond to The Day Reconstruction Method (DRM) on line and report a typical weekday. Before the participants respond to DRM, the group aswered to the following test: The Five Facet Mindfulness Questionnaire [61], The Beck Depression Inventory (BDI; [21]), Beck Anxiety Inventory (BAI; [62]), The Composite International Diagnostic Interview Short Form- Alcohol Dependence and Drug Dependence (CIDI-SF; [63]) and The Mental Health Continuum-Short Form [64]. The result of the testing and implementation of DRM enabled the group was classified as: flourishers (108), non florishers (67) and depressed (33). Three months after, the subjects who completed the DRM were invited to respond again to The Five Facet Mindfulness Questionnaire [61] in this stage the participants slipped to 178 subjects who was the final sample. Examinig the daily lives of florishers compared to depressed and non florishers the authors discovered that flourishers respond more positively to pleasant activities, ranging from interacting to learning. The analysis pointed out important differences in florishers individuals in positive emotionality that modify significantly the capabilities of coping and feeling of well being and that the maintenance of this blossoming is the importance given to ordinary everyday experiences as, for example, chat with a colleague, helping, interacting, playing, learning, spiritual activity and exercising.

Mauss *et al.* [6] investigated whether dissociation between positive emotion experience and behaviors predict two facets of psychological functioning- depressive symptoms and well-being- and if so, wether these effects are mediated by social connectedness. The study used a sample of 135 students and was conducted in three times. Initially there was a survey of levels of depression and well-being were assesed by a Five-item Short Version of The Center for Epidemiological Studies Depression Scale (CES-D; [28]), and The Five-item Satisfaction With Life Scale (SWLS; [39]). In a second moment, six months after, it was verified a positive excitement and dissociation of behavioral experience by a session where participants watched two minutes of amusing film clip and a laboratory software was used to compute averages for each second of data during the film. Six months after, social connectednnes, appraisal social support and belongingness social support were each assessed with Four-item Scales from The Interpersonal Support Evaluation List [65], loneliness was assessed with the Eight-item UCLA Loneliness Scale [66]. The results showed that positive experience-behavior dissociation predicted social connectedness ($p<0.05$); social connectedness was negatively associated with depressive symptoms ($p<0.05$) and positively associated with well-being ($p<0.05$). This study showed that the more participants' positive experience and behaviors were dissociated during a positive emotion induction, the greater levels of depressive symptoms and the lower levels of well-being participants experienced six months later.

In another study, [67] examined the psychological health correlates of positive emotion variability versus stability across 2 distinct studies. The first study used a daily experience approach in 244 adult participants from a U.S. community and they were asked to rate their positive feelings each day before going to bed for 14 consecutive days and indicated how "happy" and "excited" they felt over the past 24 hours on a scale ranging from 1(very slight/not at all) to 5 (extremely) with combine responses into one positive emotion composite. The authors calculated two scores individually for each participant: positive emotion variation (PE var) as the standard deviation across 14 days and overall positive emotion (PE mean) as the average across 14 days. Participants also completed a self-report version of the Global Assessment of Functioning Scale (DSM-IV), Satisfaction With Life Scale [39], Beck Depression Inventory [21] and The Anxiety Screening Questionnaire [68]. The study 2 adopted a daily reconstruction method in 2391 French adult recruited through a large on line study. Participants were asked to report what they did on the previous day, episode by episode. For each episode participants indicated a positive emotion from The Differential Emotion Scale [69] and again the two scores were calculated the PEvar and the PEmean as the positive emotion average across episodes. The participants completed the Satisfaction With Life Scale [39] and Subjective Happiness Scale [70]. The results showed that the participants of the first study who experienced greater PEvar throughout the 14 day study period reported worse psychological health outcomes including decreased life satisfaction and functioning and increased depression and anxiety ($ps<0.05$). On the second study participants who reported greater PEvar throughout the previous day experienced worse psychological health outcomes with decreased life satisfaction, daily satisfaction and subjective happiness($p<0.01$). These findings support the notion that positive emotion variability plays an important role in psychological health above overall levels of happiness, and that too much variability might be maladaptative and might increase anxiety and depression.

CASE-CONTROL STUDIES

In the first case-control study, [12] examined whether there would be differences in perceptions of consensus for positive, negative and neutral events in depressive and non-

depressive and the effects of these interpretations both on attributive style and on levels of depression. To this end, 52 subjects were divided according to The Beck Depression Scale (BDI; [21]). 23 subjects were classified as depressed, 22 subjects were classified as nondepressed and seven participants were classified neither depressed nor nondepressed. In this phase the subjects were divided into groups of five to ten participants and for an hour responded the following questionnaires in a booklet: The Beck Depression Scale (BDI; [21]), The Attributional Style Questionnaire (ASQ; [71]) and a event questionnaire contained 45 statements written in second person that described positive, negative and neutral interpersonal and achievement events. The results indicated that positive events were rated as having happened more often than negative or neutral ($p<0.0001$). A main effect of target across all event types suggested that the events were rated as happening more to others than to itself ($p<0.0001$), an interaction between target and depression indicated that this pattern was truer for depressed participants than nondepressed ($p<0.01$) and an interaction between event type and target in nondepressed subjects, indicated that positive events were rated as more likely to happen to itself than to others, whereas negative and neutral events were rated as more often to happen to others than to the self ($p<0.0001$). The depression is not affected by the perception of others but by the perceptions of the self that have a direct association with depression and an effect mediated through attributional style for negative events. The authors pointed out the importance for the development of prevention and treatment strategies to determinate the causes of a depressive attributional style.

Sheeber *et al.* [5] focused on delineating the dimensions of affective experience in depressive disorder in adolescents. The affect regulation involved in initiating, maintaining and moduling the occurence, intensity and duration of the experience. The affective behaviors of 75 adolescents with major depression were compared to a matched cohort of 77 healty adolescents and the participants were submitted for these tests: The Center for Epidemiological Studies- Depression Scale (CES-D; [28]), The Diagnostic Interview Kiddie-Sads Trace (K-SADS) [72], The_Positive and Negative Affect Scale-Expanded Version (PANAS-X; Watson & Clark [57]), The Meta Emotion Interviews (MEI/CHILD-MEI; [73]) and Behavioral Observations: The Living in Family Environments System (LIFE; [74]). The results showed that depressed boys and girls showed relative duration of dysphoric and angry affect, in particular, depressed boys and girls remained in angry states longer ($p<0.01$) and depressed girls also remained in dysphoric states longer, than did their healthy peers. The depressed adolescents didn't maintain happy affective states for as long a time as the healthy ones ($p<0.01$). The authors highlight the deficit of maintenance of positive affect and the longer duration of physiological responses associated with negative affect as a critical mechanism in depression.

In the last case-control study [7] examined whether depressed participants were also impaired at selecting relevant positive content in the context of representations in working memory (WM) such an impairment would limit depressed person's ability to use positive material to ameliorate the cognitive effects of negative information. The authors recruited 42 subjects and according to The Structured Clinical Interview for the DSM-IV (SCID [75]) divided in 20 depressed and 22 healthy and administered Emotion Regency-probes task based on research by Monsell [76] with positive words, neutral and negative content where 260 words with emotional content and 330 neutral words from the Affective Norms for English Words (ANEW; [77]). The results presented that for the nondepressed participants, interferences levels differed significantly across conditions ($p<0.001$) and this participants exhibited lower levels of interference in the emotion focus condition in the neutral and the emotion non-focus conditions ($p<0.001$). For the depressed group levels did not differ across conditions ($p>0.05$) and these participants exhibited higher interference levels than did their non-depressed peers in the emotion focus condition ($p<0.01$). Nondepressed participants showed less interference for positive than for neutral information and depressed subjects showed equivalent levels of interference for positive and neutral stimuli.

RANDOMIZED CLINICAL TRIALS

Beck & Strong [78] investigated the effects of positive and negative connotation of the speech therapist about the symptoms of depression. The aim of the study was to compare the results of different interpretations of therapists to stimulate changes in depressed patients. For that, 84 students responded to the Beck Depression Inventory [21] and the 30 who had scores between eight and 31 were selected for the study (moderately depressed). The participants were divided into three groups of 10 where a group participated in two interviews with positive interpretations, the other group had two interviews with negative interpretations and the trird group was the control and the two sessions only answered BDI Scale, Personal Mood Inventory [79] and Barrett-Lennard's Relationship Inventory [80]. A month after the second interview all students were contacted again and retested in two sessions. At the end of the first interview of the posttest the therapist assigned students a task to perform every day until the next interview, such as walking in a park and greeting a stranger, visiting a friend, or going to the Student Union and saying hello to someone. The difference between the control group and the groups that received intervention was statistically significant ($p<0,005$). From the 20 subjects who participated in the interviews 16 reported in posttest that suffering had declined or disappeared. The group that received positive interpretations, nine students responded that the mood was no longer a problem for them while five students of the group that received negative interpretation reported that their mood continued to be a problem that causes suffering. This study identifies the interpretation with positive connotation as a therapeutic method facilitator of change to the depression.

Joormann *et al.* [81] examined whether depressive patients could intentionally forget negative material. 72 volunteers were divided between depressive and non-depressive according to DSM IV Structured Clinical Interview (SCID [75]) and responded to the Beck Depression Scale II (BDI-II; [40])(the average score for the 36 subject of control group was 1.8 and the average for the depressive group 36 was 27.5). The first phase was the learnig moment and 36 words negative content, neutral 36 positive and 36 were selected

from the Battery of English Words of Affective Contents [77] (ANEW: 1999) and were paired to be presented to the participants and be memorized. The sessions lasted from 60 to 90 minutes and the first phase was to learn where 43 pairs of words were presented on the computer screen for five seconds each. The participants were instructed to study the words for later testing. At the end of this phase, the subjects were tested and needed to get 50% correct to follow for next step. The participants that do not achieve the goal answered to the Beck Depression Scale II (BDI-II; [40]) tests and Strategies Questionnaire and not progressed.

In the second phase, the participants were instructed not to think in the words that appeared on the computer in red and to answer and memorize the words that appear in green. Half of the participants were asked to suppress positive words and negative answer and the other half the other way around. In the third phase, the subjects were instructed to remember all the words of the learning phase and the words deleted and remembered and in this stage each word appeared in black by four seconds on the computer. The group without depression presented a percentage of 84% for remembrance of positive words deleted and reinforced negative versus 83% for the reverse situation. The depressive group presented 85% for recalling words that suppressed the positive content and reinforced the negative against 73% for remembrance that suppressing the negative content words and stressed the positive. The study showed that depressive participants managed to intentionally forget negative words content and suggests that this training can become a strategy able to combat negative thoughts of depressive rumination.

Seligman *et al.* [3] have developed research in order to prove the effectiveness of positive psychology interventions to increase happiness. The survey was conducted online and the authors prescribed five exercises to increase happiness and a placebo control. An exercise focused on developing gratitude (write a letter of gratitude and delivering it to someone important), two focused on developing talents and strengths (identifying personal strengths and using their strengths in different ways), two emphasized making patients what was good in them (you at its best - they reported a time where they were happy and what forces were at that time and three good things in life where they described three situations that were good on the day and causes). The placebo group was writing exercise for a week about recent memories. In this sense, 577 participants were recruited on line in a month and completed two questionnaries, The Center for Epidemiological Studies-Depression Scale (CES-D; [28]) and The Steen Happiness Index (SHI; [3]). The subject visited a specific Web site where they were encouraged to print the instructions and perform the same exercises during a week and then return to the Web site to completed follow-up questionnaires in one week, one month, three months and six months and answered the same measures of happiness and depression. Only 411 subjects completed the five follow-ups and were considered statistically. The results showed that two of the exercises (using their personal strengths and three good things in life) increased levels of happiness and depression symptoms decreased for six months. The exercise of gratitude visit generated positive changes for a month and the other two exercises and the placebo showed transient effects on levels of happiness and depressive symptoms. Research has shown that exercises that emphasize personal and positive emotion forces immediate effect by increasing the levels of happiness and reducing depressive symptoms.

In another study, [16] produced two surveys in order to prove the effectiveness of positive psychotherapy, one with medium to moderately depressed adults and another with severely depressed adults. The first study described 40 moderately depressed subjects with scores between 10 and 24 on the Beck Depression Inventory-II (BDI-II; [40]) were recruited. Nineteen participants were submitted to positive psychotherapy, 21 of the control group were not submitted to psychotherapy. The treatment lasted six weeks with sessions of two hours duration. Both groups were tested soon after the intervention, three months, six months and one year after the intervention with the following instruments: The Beck Depression Scale II (BDI-II; [40]) and The Satisfaction With Life Scale (SWLS; 1985).

Participants who have undergone positive psychotherapy showed decrease of depressive symptoms and increased satisfaction with life during the intervention and this result is sustained over time. In the second survey reported by the authors, 32 severely depressed subjects were allocated in three modes of intervention in order to analyze its effects. Eleven have undergone positive psychotherapy with only 14 sessions following the protocol proposed by the authors. Nine were subjected to the usual psychotherapy treatment depression and were attended by five psychologists and a last group of 12 individuals in addition to the usual psychotherapeutic treatment made use of antidepressants. After the interventions the participants were subjected to the following tests: Hamilton Rating Scale for Depression (HRSD; [82]); Zung Self-Rating Scale (ZSRS; [83]); Outcome Questionnarie (OQ; [84]); The Satisfaction With Life Scale (SWLS; [39]) and were assessed for the remission of depression symptoms. The results indicated that the positive psychotherapy performed better than the others with margin calls results in all instruments. In PPT group ZSRS presented 43.27 score against 54.67 from usual treatment and 55.70 from usual treatment plus medication. In Outcome Questionnaire, the PPT group scored 45.82 versus 63.67 and 55.50. And in the SWLS, the score was 21.91 against 19 and 18.50, increasing the positive emotion, engagement, meaning and significantly, reducing the levels and depression symptoms.

Fredrickson *et al.* [85] conducted a survey in order to investigate the effects of loveling-kindness meditation on health and well-being. The 139 subjects were divided between 67 that initially would receive training in meditation and 72 that would be initially from the control group. For nine weeks, all participants were instructed to practice this meditation and to access a Web site in order to complete the following questionnaires: Mindfulness and Awareness Scale [86]; Hope Scale [38]; Savoring Beliefs Inventory [87]; Life Orientation Test LOT: [88]; Ego-Resilience Measure [35]; Psychological Well-Being Scale [31]; Dyadic Adjustment Scale [89]; Positive Relations With Others, [90]; Satisfaction With Life Scale [39] and Center for Epidemiological Studies – Depression Measure CES-D; [28]. After a week of response to the questionnaires the group of 67 subjects participated in a workshop with daily practice of meditation and every day the subjects visited the Web site and reported their

emotions and the time spent with meditation the day before and completed the Modified Differential Emotions Scale (mDES; [91]) on-line monitoring continued for another week after the workshop ended. At the end the participants completed the same instruments as a posttest. Two months after, the meditation workshop began to the control group of 72 subjects, but there were no further measurement. The study showed that participants who invested an hour per week practicing meditation significantly increased their positive emotions in everyday situations of life, their social interactions and their personal resources and reduced their symptoms of depression.

Huta & Hawley [92] conducted two surveys with healthy individuals and depressive to verify the role of personal strengths and vulnerabilities in well-being. In the first study 241 healthy participants attended search on line where the focus was to analyze the influence of positive well-being about the negative affect and depression. Subjects completed a survey on line and then answered to the following inventories: Values in Action Inventory of Strengths (VIA-IS; Peterson & Seligman [93]); Dysfunctional Attitudes Scale DAS; [56]; Beck Depression Inventory Second Edition BDI-II; [40]; Satisfaction With Life Scale SWLS; [39]; Positive Affect and Negative Affect [94]; Self-Esteem [95]; Subjective Vitality Scale [96]; Meaning [97] and Elevating Experience, [97]. The results pointed an interaction between strengths and vulnerabilities and suggest that personal forces protect people against harmful effects of vulnerabilities. The second study reported in the article presented 54 depressive individuals, with a minimum score of 14 in the Beck Depression Scale II (BDI-II; [40]), which were submitted to cognitive-behavioral protocol of the book the Mind over mood: change how you feel by changing the way you think [98] before and after respond to the survey with the instruments previously reported on the first study of the article. The focus of the second study was to analyze the relationship between forces and vulnerabilities in depressed. The results reinforce personal forces have main role in reducing depressive symptoms and points out that three forces in particular promoted the recovery of depression: hope, appreciation to the beautiful and excellence and spirituality.

Bylsma *et al.* [99] evaluated the emotional reactivity to daily events in depressive and healthy subjects. 99 participants after answering the Structured Clinical Interview for DSM IV-TR Axis I Disorders (SCID-I) were divided into three groups: 35 with major depression, 26 with minor depression and 38 healthy and they were submitted to Computerized Experience-Sampling-Method (ESM; [100]). For three consecutive days the subjects recorded in a handheld computer programmed to sound an alarm 10 times during the day (between 8 a.m. and 11 p.m.) to the individual account of humor and the context and nature of the most important emotional events that had occurred since the last record. After the three days of ESM logs the handheld was returned and the Day Reconstruction Method (DRM; [100]) was answered. DRM requested participants to rebuild the previous day structuring it as a continuous series of episodes describing details such as what they were doing, time of episodes, and thoughts and feelings involved. While the subjects submitted to DRM they answered Beck Depression Inventory-II (BDI-II; [40]); and The Beck Anxiety Inventory (BAI; [62]). The results showed that the depressives subjects report their failures, highest rates of negative affect and negative social interactions while healthy participants report their successes, positive affection and positive social interactions and that the depression participants are also more reactive nicely to daily events that healthy ones.

Albarracin & Hart [101] reported four experiments that examined the relationship between action, inaction and humor. In the first experiment, 87 psychology students were induced to experience happiness and anger and wrote a letter to a friend about a personal living experienced happiness, frustration or anger. Participants who would try neutral mood were asked to write about a typical day in their lives. Five minutes after that, completed sentences with 20 neutral, positive and negative words that connoted both action (motivation, make, behavior, engaged, action, do, go and active) and inaction (still, pause, interruption, calm, cripple, unable to stop and freeze). The task is part of the Computerized Edinburg Associative Thesaurus [102]. Shortly after, the subjects completed 21 issues accessing verbal ability (antonyms, complete sentences and analogies) and mathematical ability (resolution of problems and algebraic equations). The results showed that participants in positive mood and neutral conditions showed better performance in terms of action while the negative mood showed conditions for inaction.

In the second experiment, 139 participants completed the same sentences with words of neutral content (button, cement, chair, lock, pencil, carpet and paper), and the humor was also induced to happiness and anger. Shortly after the subject participated in a decision test where a story was received to be read ("Mr. Miller"; [103] and after reading this material were asked to choose between 12 titles of articles that were relevant to reaching a decision. The numbers of articles that the subjects read were taken into account and the result showed that the design of action increased the selection of articles on subjects who have experienced positive mood and that it decreased in participants who experienced negative mood. In the third experiment, a sample of 81 participants were induced to experience happiness and anger and soon after the organizing and completing scrambled sentences using words of inaction (first experiment) and neutral words (second experiment). On the next moment they received a celebrity photo for review and then they answered questions about what the recall from the image. The results also revealed an association with positive humor and action and negative mood with inaction influencing on memory performance. The experiment four replied the first with 140 students of Psychology except that negative mood induced was the sadness instead of anger. The four experiments that reinforced the negative affect thwart the activity and increase the inaction while the positive affect enhance and reinforce the action as well as the performance.

Dalgleish *et al.* [104] recruited 50 volunteers who completed the Structured Clinical Interview for the DSM-IV Axis I were divided into 16 depressed, 17 remitted depression at least for three months and 17 never depressed in order to verify the structure of life. A week later the subjects were submitted to Life-Structure Card-Sorting Task proposed by Zajonc and adapted by Linville [105] where they were asked to divide their lives into chapters and instructed

to write their story using the words set out in 46 cards both for the past and for the future. Immediately after that they answered to the following tests: Beck Depression Inventory (BDI; [40]), the Spielberger State-Trait Anxiety Inventory (STAI; [20]) and Positive Affect Negative Affect Scale (PANAS; [94]). The data showed a depressive profile relative to the past with predominance of negative information and vulnerability in depressive group and in participants at remission, but surprisingly the groups showed no significant differences in ratings of life structure for the future. This research points out that even with a history of depression peolpe can contemplate the future not as a mere projection of the past.

DISCUSSION

In this study we aimed to conduct a systematic review of the literature on the impact of positive emotion in the treatment of depression and on the use of strategies of positive psychology that involves positive emotion to treat and reduce symptoms of depression. It has been observed through the studies, [3, 16, 85, 8, 11, 92, 10, 14] that strategies of positive psychology have impact on signs and symptoms of depression, as well as seeming to prevent and increase well-being, producing protective elements, such as resilience and coping capabilities that reduce relapses in the treatment of depression. The positive emotion and the relations with depression and well being was observed through the studies [9, 23, 12, 49, 13, 5, 15, 55, 67, 59, 6].

The positive psychology, according to Wood & Tarrier [2] introduced a new form of treatment which puts in evidence the study of virtuous aspects of human nature in addition to developing personal forces believing that the same work as protectors against the disease. In this context [17], the positive psychology is the science of qualities and resilience.

Based on the analysis of selected studies on depression and positive psychology as certain a vast repertoire of strategies in order to increase the positive emotion and promote cognitive opening necessary for the treatment. A lot of strategies were used successfully, we emphasize the pleasant activities as religious service, watching movies, playing cards, eating out, gardening [23, 41], mindfulness [85, 14], meditation [85], gratitude [8], the development of positive cognitions through the restructuring of negative content thoughts [7], changing the style of thinking from pessimist to the optimist [12, 11, 10]), social connectivity [6], developing talents and strengths to increase coping strategies [3,85,8]), expanding social support network in order to develop resilience and well-being, positive emotion, engagement, achievement, and positive relationships ([13, 8, 11, 14, 6, 10].

All the techniques used in the surveys [11, 2, 10, 7, 78, 92] aim to reduce vulnerabilities, enhance personal forces and resources to lessen the impact and therefore the losses generated by depression and thus develop resilience and well-being.

In [33,10,11,55,12,101] stressed the importance of positive social relationships support generators as support for the development of resilience and reducing the levels of stress and depression, indicating therapeutic possibilities to strengthen social support network.

The positive cognitive triad (positive view of yourself, of the world and of the future), automatic positive thoughts and optimistic were highlighted by Crocker, [10-12] as generators of satisfaction, resiliency and reducing levels of depression. In this context, psychologists must develop strategies in order to teach their depressive patients the importance of the development of positive cognitive triad, and optimistic style of automatic thoughts positive. According to Dalgleish *et al.*, [104] it was observed that individuals with a history of depression and with negative information and vulnerability in the life on the past and on present, surprisingly managed to contemplate the future not only as a mere projection of the past. This finding challenges the literature that claims that the negativity and hopelessness are present on the vision of future of depressive and brings the possibility of therapeutic intervention in this cognitive aspect.

The behavioral aspect is also reviewed [23, 85] that emphasize the role of pleasant activities in order to reduce the intensity of the depression, through the engagement in pleasant activities to minimize depression and produce well-being.

Another fundamental aspect of positive psychology is to develop personal forces like: talents, strengths and abilities in patients with much vulnerability, because these personal forces are protective elements and produce well-being [18,10,78,92] allege that the forces have key role in reducing depressive symptoms and demonstrated in their research that three forces: the hope, the appreciation of the beautiful and excellence and spirituality, promoted depression recovery despite cognitive vulnerabilities submitted by individuals.

It was observed [9, 19, 49, 11, 14, 10, 3, 16, 85, 92, 6, 67] that the development of positive emotion has led to a better psychological functioning and consequently a reduction of symptoms of depression.

A limitation of the study, however, lies in the fact that most articles have produced qualitative results showing the improvement of patients in behavioral terms. It would be interesting that new studies focus on production of quantitative data with statistical treatment.

CONCLUSION

On the basis of selected articles it was established that the strategies of positive psychology are potentially effective tools for the prophylaxis and treatment of depression. The positive emotion, in fact figured in many strategies used in the presented research [9, 19, 49, 11, 14, 10, 3, 16, 85, 92, 6, 67] and is directly related to the improvement of the levels of depression. Increasing positive emotion, developing personal forces, seeking direction, meaning and engagement for the daily patient proved to be important and meaningful strategies for reducing the signs and symptoms and relapse, so applicants in depression [78, 18, 10, 6, 14].

The applicability of the findings of this study is characterized by a range of strategies which are important therapeutic procedures for reduction levels of depression. However, the use of a repertoire of differentiated strategies hindered a comparative analysis of the effectiveness of treatments and

the accession and evasion of it. In this sense, it would be interesting more researches to be carried out using a limited number of strategies, this way comparative analysis can be performed.

CONFLICT OF INTEREST

The authors confirm that this article content has no conflicts of interest.

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Artigo 2

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Treatment of Internet Addiction in Patient with Panic Disorder and Obsessive Compulsive Disorder: A Case Report

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Treatment of Internet Addiction in Patient with Panic Disorder and Obsessive Compulsive Disorder: A Case Report

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Abstract: Problematic Internet use is a worldwide social issue and it can be found in any age, social, educational, or economic range. In some countries like China and South Korea internet addiction (IA) is considered a public health condition and this governments support research, education and treatment. Internet addiction has been associated with others psychiatric disorders. Panic disorder (PD) and Obsessive Compulsive Disorder (OCD) are anxiety disorders that involve a lot of damages in patient's life. We report a treatment of a patient with Panic Disorder and Obsessive Compulsive Disorder and internet addition involving pharmacotherapy and Cognitive Behavioral Therapy (CBT). The Cognitive Behavioral Therapy was conducted 1 time per week during 10 weeks and results suggest that the treatment was an effective treatment for the anxiety and for the internet addiction.

Keywords: Cognitive behavioral therapy, internet addiction, panic disorder, obsessive compulsive disorder.

INTRODUCTION

Internet addiction (IA) disorder was introduced by Kimberly Young [1, 2] in 1996 [3] proposing an explanation for uncontrollable and damaging use of internet comparing the criteria used to diagnose pathological gambling and others addictions [1]. Internet addiction is defined as the lack of ability to control Internet use causing distressing time consuming, resulting in social problems, occupation or financial difficulties [4, 5], neurological complications and psychological disturbances [6]. Internet addicts experience higher levels of pleasure when are using Web than in real life [7].

Several researches indicate an association of internet addiction with psychiatric disorders that predisposes, aggravates or facilitates internet use [2, 3, 6-9]. Some mental health studies see excessive internet use as a symptom of another psychiatric disorder such as anxiety or depression and others considered an impulsive control disorder not otherwise specified [4, 6]. A Chilean description of IA among medical students highlights statistical associations with depression [10] and that patients with IA also present anxiety disorders the hypothesis that the internet is used as an escape valve to relieve anxiety [11, 12].

Panic disorder (PD) is known for recurrent and unexpected attacks of sudden onset and short duration (few minutes). A panic attack may be followed for up to one month by persistent worry regarding another panic attack. It may consist of several symptoms, such as, feelings of shortness of breath, subsequent hyperventilation, palpitations, chest pain, sweating, chills, nausea, trembling, fear of dying or losing control, numbness, and a feeling of detachment or unreality [13, 14].

Obsessive compulsive disorder (OCD) is characterized by presence of intrusive thoughts or images (obsessions) and repetitive behaviors or rituals (compulsions) to relieve anxiety. The obsessions or compulsions are time-consuming or cause significant distress in social, occupational or others important areas of functioning [14]. OCD symptoms often impair social relations, ability to complete hygiene and cognitive tasks and family relationships [15].

On the current literature there are some case reports that investigated evidences of the internet addiction as pathology. Young, 1996 [16] described a case of a homemaker 43 years old addicted to using Internet with no prior addiction or psychiatric history showing significant impairment to her life. Griffths, 2000 [17] described five cases and concluded that of the five cases, only two teenagers described addicted subjects. Abreu & Stravogiannis, 2009 [18] related a case of a teenager of 15 years-old that was hospitalized for 14 days and showed some comorbidities as bipolar disorder, attention-deficit/hyperactivity disorder, OCD, simple phobia and impulsive control disorder.

Few reports investigated treatment for Internet addiction. Kar; Swain; Nayak & Rath, 2007 [19] described a 19 year old male with internet addiction and impulsive disorder that was treated with pharmacotherapy (sertraline and clonazepam) and cognitive behavior therapy that improved almost fully in three months of treatment.

Both pharmacological and non-pharmacological approaches have been studied and recommended for IA treatment [20]. Cognitive Behavioral Therapy (CBT) has been adapted and used in treatment showing efficiency once helps patients recognize dysfunctional cognitions, modify and restructure cognitions. Internet addicts learn to identify trigger feelings and actions, new coping skills and strategies to prevent relapses [21].

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Therefore, the objective of this article is to describe a treatment of a patient with PD, OCD and internet addition involving pharmacotherapy and Cognitive Behavioral Therapy. Another aim of this paper is to produce clinical research to corroborate the recognition of Internet Addiction as a behavioral addiction and for effective treatments for that. Both pharmacotherapy and CBT were started simultaneously. The patient signed a consent form approved by Ethics Committee at Federal University of Rio de Janeiro.

CASE REPORT

Ms. S., a 24 year-old Caucasian woman, single and administration college student had been suffering from panic disorder with agoraphobia with comorbidity of OCD according to DSM-5 criteria. She arrived at Institute of Psychiatry of Federal University of Rio de Janeiro (IPUB/UFRJ) at Laboratory of Panic and Respiration seeking treatment for her panic symptoms. At screening service she responded the following scales: MINI 5.0; Hamilton Anxiety Scale, Hamilton Depression Scale, Chambless Body Sensations Questionnaire, Bandelow Panic and Agoraphobia Scale, Clinical Global Impressions, Young Internet Addiction Scale and an Internet, Facebook and Phone Dependency Questionnaire. At this time the internet addiction was observed and she was forwarded for pharmacotherapy and CBT by DELETE Group.

The patient is the only child of her parents and related diagnosis of OCD over a year and a half before and that she had made previous treatment for OCD symptoms but decreased intensity and did not go away. The panic symptoms emerged about two months before the interview. The association of panic and OCD symptoms led the patient to a severe use of internet to manage anxiety. Her relatives had noticed changes in her behavior on internet use especially the time spent and her mood when they questioned about internet use.

She reported several PD symptoms, such as tachycardia, sweating, tremors, lack of energy, sleep disturbance and chronic anxiety, during her activities of daily living (ADLs), for instance experiencing panic attacks at shopping, at bus, supermarket, at university and other situations. She related that was using internet and phones games to relieve anxiety to leave home but at the beginning of the treatment she was avoiding public places and only leaves home accompanied and using the games specially a game called "candy crush". The OCD symptoms like wash hands innumerable times a day, change clothes often, take very long baths, checking doors and windows before going to bed or leaving home, verify that the taps are closed, lamps flash on and off again, on and off the mobile phone or the TV again to make sure that are turned off, check the bag or wallet to make sure not missing documents or keys impacts and hampered the patient to leave home spending much time to be ready to go university and others commitments.

Both pharmacotherapy- clonazepam (0,5mg) and sertraline (50mg) once daily - and CBT were started. The CBT was conducted one time per week during 10 weeks. The focus was to teach the patient how to handle with anxiety and with internet for that we worked on breathing retraining with diaphragmatic breathing exercise, education about the PD and OCD symptoms and about internet use, time management, identification the triggers of problematic internet use, changing habits, cognitive restructuring, exposure and response prevention, promotion of social support, building alternative activities, promotion of functional internet use.

The patient has an improvement on the PD and OCD symptoms and the use of internet is considered for her as an appropriate. She related that with medication and CBT she returned to college and to go to market or to take a bus to go to shopping or to a cinema and was ready to leave home quickly. The Table **2** shows the improvement on the scales.

DISCUSSION

Both pharmacological and non-pharmacological approaches have been studied and recommended for IA treatment [20]. Up to now, there are only few case studies that report Internet addiction (Young, 1996 [16]; Griffths

Table 1. Description of psychotherapy.

Session	Description
01	Interview, assessment scales and explanation of treatment.
02	Education about anxiety, PD and OCD symptoms and internet use.
03	Breathing retraining with diaphragmatic breathing exercise, relaxes muscles of body, accept anxiety feelings rather than fight them.
04	Identification of anxious thinking of Panic, OCD and problematic internet use. " If I panic on a bus I will drop dead of a heart attack" " Others will notice my anxiety symptoms and will think I'm strange" " I'll be dirty if I don't wash my hands several times on day" Generating alternative beliefs.
05	Planning exposures to feared thoughts, urges, objects and situations. Exposure Plans to confront.
06	Changing habits breaking routines and time management.
07	Changing habits breaking routines and time management.
08	Improving relevant skills building alternative activities like physical exercises, social communication, reconnecting with old friends, making new friends and social support.
09	Lifestyle changes to promote functional internet use. Analyses of improvement.
10	Reinforcement of news beliefs, behaviors and follow-up scales.

[17], 2000; Kar; Swain; Nayak & Rath, 2007 [19] and Abreu & Stravogiannis, 2009 [18]), a randomized control trial (Jager *et al.* 2012) evaluated a combined individual and group therapy creating a protocol comprises 23 psychotherapy sessions with a duration of 4 months called STICA [22].

Table 2. Comparison of scales scores.

Scales	Baseline	Deadline
HAM-A	42	14
HAM-D	19	11
BSQ	63	31
PA	38	09
IAT	81	41
GCI	6	2

Legend: HAM-A: Hamilton Anxiety Scale; HAM-D: Hamilton Depression Scale; BSQ: Chambless Body Sensations Questionnaire; PA: Bandelow Panic and Agoraphobia Scale; IAT: Young Internet Addiction Test; GCI: Global Clinical Impressions.

Some studies evaluated the efficacy of pharmacological treatment specially the use of Escitalopram (Sattar & Ramaswamy, 2004) [23], Naltrexone (Bostwick & Bucci, 2008) [24] and the combination of Citalopram with Quetiapine (Atmaca, 2007) [25] in treating internet addiction [20]. A prospective randomized clinical trial (Han & Renshaw, 2012) evaluated treatment with Bupropion in subjects with IA and major depressive disorder [26]. And a study (Han *et al.*, 2009) examined the use of Methylphenidate treatment in subjects with comorbid attention-deficit/ hyperactivity disorder and Internet videogame addiction [27]. All this reports results showed improvements in IA.

Non-pharmacological treatments also are used with IA, some studies examined CBT alone as an effective intervention. Young, 2007 described a treatment with 12 sessions of CBT and at 6 months after, patients improved motivation to change behaviors, on line time management (including abstinence from on line applications), social life and sexual dysfuncion [28]. Du *et al.* 2010, investigated a multimodal school-based CBT in adolescents compared with no intervention and verified an improvement of emotional state, regulation ability and behavioral and self-management style in patients with IA [29]. Few studies (Orzack *et al.*, 2006 [30] and Shek *et al.*, 2009 [31]) used motivational interviewing, a directive psychotherapeutic approach, as treatment of IA. Another approach described for treating IA has been reality therapy that leads patients to choose changing theirs actions and thinking. Jong-Un Kim, 2008 evaluated a Reality Therapy group counseling program on IA level of university students and showed decreases in IA measures [32].

In this case report, the authors examined the effects of a pharmacotherapy- clonazepam and sertraline- and Cognitive Behavior Therapy on a treatment of a patient with PD, OCD and internet addiction. Prior to start treatment patient presented a moderate level of depression (19 in HAM-D), a severe level of panic symptoms, OCD symptoms and beliefs and a worse clinical impression (Table **2**). For instance, regarding depression, the patient reported dissatisfied or bored with everything, annoyed or irritated a good deal of the time and pushed herself very hard to do anything. Taking into account the anxiety, the patient reported an inability to relax, nervousness, and a fear of the worst happening. According to panic symptoms, the patient reported more than 2 full attacks but not more than 1/day on average during the week, she was very distressing and in places or public situations the substantial modification of her lifestyle was required to accommodate the avoidance making it difficult to manage usual activities. Patient is not able to take bus, walk on the shopping or watch her classes at college. The OCD symptoms like checks and the difficult to be ready to leave home aggravated the situation.

This case is unique in literature and the authors expected that the OCD beliefs and behaviors could impact the addiction that is a compulsive condition. After 4 weeks of treatment, the patient improved considerably her level of depression, her respiration was strongly trained and the time management was working but at this time the idea to change habits was difficult – the OCD thought was "If things are out of order, I will be so overwhelmed with fear and anxiety that I will not be able to function" and we had to spend 2 sessions (Table **1**) restructuring this belief and organizing change. At this moment the anxiety level raised and the medication was modified for 75mg of sertraline once daily. After that the patient could engaged in the proposed exposures for panic and OCD like walking on the shopping, going to supermarket, taking bus to go to college, not perform checks, wash her hands only before meals or if it was really necessary, getting ready to leave home quickly and performed them successfully. These findings seem to reflect the behavioral improvement of patient observed in exposures.

After 7 weeks of treatment, the patient was improving and was able to decrease use of "candy crush" game and internet to face anxiety situations. She reported she was felt very well and that returned to go to the cinema and most important, came back to her classes at university course. On the 10th week, the results revealed that the patient decreased measures of all scales (Table **2**) and showed a remarkable improvement on panic symptoms, on anxiety and OCD rituals, checks and on managing time on internet and games.

This case suggests anxiety as a risk factor and may be associated with development of addictive use of internet reinforcing the hypothesis that the internet is used as an escape valve to relieve anxiety [10, 11, 12, 20].

CONCLUSION

These findings suggest that the effects of a pharmacotherapy- clonazepam and sertraline- and Cognitive Behavior Therapy on a treatment of a patient with PD, OCD and internet addiction were effective for the improvement of patient.

The improvement was remarkably due to the entirely engagement of patient on exposures, which contributed to the success of the treatment in behavioral aspects and bring to patient safety to continue. It is noteworthy that no further panic attacks occurred during the course of treatment only

few situations of mild anxiety were reported but the anxiety decreased in frequency and intensity during treatment, as well as, the OCD checks, thoughts, behaviors and the internet use to deal with anxiety and to play games.

The number of patients suffering from IA who need professional help increases around the world and there was a discussion if Internet addiction would be included or not on DSM5 and the unfavorable decision was based on insufficient empirical evidence at the time. So more clinical research has to be produced to the recognition of IA as a behavioral addiction and for effective treatments for that and this case report is a clinical support for this recognition.

LIST OF ABBREVIATION:

CBT = Cognitive Behavioral Therapy;

IA = Internet Addiction;

OCD = Obsessive Compulsive Disorder;

PD = Panic Disorder;

CONFLICT OF INTEREST

The authors confirm that this article content has no conflict of interest.

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Artigo 3

Treatment outcomes in patients with internet addiction and anxiety

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TREATMENT OUTCOMES IN PATIENTS WITH INTERNET ADDICTION AND ANXIETY

ABSTRACT:

Aims To investigate the effectiveness of a treatment for Internet addiction (IA) and anxiety disorders, using modified cognitive behavioral therapy combined with medication, and to analyze the relationship between anxiety and Internet addiction.
Design Open clinical trial. **Setting** Laboratory of Panic and Respiration at the Institute of Psychiatry of the Federal University of Rio de Janeiro (IPUB/UFRJ) and DELETE(detoxification of technologies) Group at IPUB/UFRJ **Participants** A sample of 84 patients (42 were comorbidities group and 42 were without comorbidities group) seeking treatment for anxiety symptoms and/or Internet Addiction **Measurements** The subjects responded to The Mini International Neuropsychiatric Interview 5.0; the Hamilton Anxiety Scale (HAM-A), the Hamilton Depression Scale (HDRS), Clinical Global Impressions (CGI) and the Young Internet Addiction Scale (IAT). The patients who had only Internet addiction received psychoeducation on conscious internet use and bibliotherapy and were considered the group without comorbidities, while the patients with whom Internet addiction and anxiety disorder were observed were forwarded for pharmacotherapy and psychotherapy. **Findings** Both internet addiction and anxiety decreased after treatment; the average of HAM-A of the comorbidities group at the beginning was 33.93 ± 7.67, suggesting severe anxiety, and at the end of treatment it was 15.00 ± 5.11, suggesting mild anxiety and a significant improvement. The average internet addiction score at the beginning was 67.88 ± 9.03 and at the end of the psychotherapy the majority of participants showed an average score of 37.79 ± 11.41; indicating a notable improvement. The relationship between anxiety and internet addiction existed and was strong (0.722).
Conclusion The two groups showed improvements and t-tests demonstrated the effectiveness of the treatment.

Keywords: Internet Addiction, Anxiety, Cognitive Behavioral Therapy, Treatment.

1.INTRODUTION:

The internet became popular and has grown wildly in recent years, with the ease of communication, access to information, learning assistance, search for services, leisure and fun having transformed the internet into an indispensable tool. A range of users are unable to control their internet use, often resulting in problems at work, in their social life and sexual pursuits, financial complications, a decline in academic or school performance and other negative consequences. Ivan Goldberg, a New York psychiatrist, pioneered the suggestion of internet addiction in 1995, based on the criteria for substance dependence [1]. In light of

the fact that Internet addiction is not a recognized disorder on DSM5 [2], the diagnostic criteria for IA is oft discussed and there are three most used models. The first is called the component model, suggesting that six components are present in all addictions, these being: salience, mood modification, tolerance, withdrawal, conflict, and relapse. This model argues that the addictions share elements of biopsychosocial processes and it originates from pathological gambling [3,4]. The second model also takes the criteria for pathological gambling as a starting point and defines Internet addiction as a failure of personal impulse control that does not involve external substances, proposing excessive preoccupation with the Internet; the need to use the Internet with increasing amounts of time to achieve satisfaction; having repeatedly made unsuccessful efforts to control, cut back or stop Internet use; feeling restless, moody, depressed or irritable when attempting to cut down or stop use; staying online longer than originally intended; loss of a significant relationship, work, an educational or career opportunity because of the Internet; lying to family, therapists or others to conceal the extent of involvement with the Internet; and using the Internet as a way of escapism from problems or to relieve a dysphoric mood. The user is addicted when five or more criteria are present for a 6-month period [5,6,7]. The third model considers the clinical characteristics of a large group of Chinese patients thought to have IA: symptom criteria (both must be present): preoccupation and withdrawal symptoms; one or more of these criteria: tolerance, persistent desire and/or unsuccessful efforts to control use, continued use despite problems, loss of other interests, use of the Internet to escape or relieve dysphoric mood; clinically significant impairment criterion: functional impairments (reduced social, academic, working ability), including loss of a significant relationship, work, or educational or career opportunities. For this model the duration of IA must have lasted for an excess of three months, with at least six hours of Internet use (non-business/non-academic) per day [8].

This lack of official diagnosis criteria results in no consensus in assessing IA; international prevalence rates use different questionnaires such as the Young Internet Addiction Test (IAT) [6], the Compulsive Internet Use Scale (CIUS) [9], the Excessive Internet Use Scale (EIU) [10], the Problematic Internet Use

Questionnaire (PIUQ) [11], the Chen Internet Addiction Scale (CIAS) [12], The Addiction Profile Index Internet Addiction Form-Screening Version (BAPINT-SV) [13], the Internet Addiction Proneness Scale (KS scale) [14], and Young's Diagnostic Questionnaire(YDQ) [5]. In this function, the worldwide prevalence rates of IA ranged approximately from 1% to 18.7% [15].

Internet addicts personalize their addiction, choosing the format and the coping strategies for dealing with problems. People may experience Internet addiction in five different ways or/ subtypes: cyber sexual addiction, cyber-relational addiction, net compulsions, information overload and computer addiction. When the online activity begins to produce an impact on relationships, family life or work, and the user cannot control or stop this activity despite the prejudicial effects on life, the user has become addicted [7]. A critical review [16] claims that the addiction to a behavior follow addictive patterns, whereas internet behaviors in general do not, in internet addicts is helpful to characterize individual differences that associated with environment factors increases internet use. Internet addiction is a multifaceted disorder because different aspects affect people in different ways. This multifaceted aspect is the target of some debate as to whether these subtypes should be considered as separate disorders or dimensions of internet addiction [17].

Researchers suggest that this excessive use of the internet can lead directly to an internet addiction (IA) [3,4,18,19,20]. This behavioral addiction has awaken the interest of Psychiatry, especially as it has been suggested that there is an association with psychiatric disorders like depression [21-30], attention deficit and hyperactivity [21,23,27,28,31,32,33,34], hypomania [35], generalized anxiety disorder [27,33], social anxiety disorder [27,33], dysthymia [33], alcohol use disorder [35], eating disorder [36], obsessive compulsive personality disorder [33], borderline personality disorder, avoidant personality disorder [33], social phobia [21,23,37] and insomnia [38]. A Korean study shows that nearly 86% of adolescents with IA have psychiatric comorbities [39]. It has been argued that IA is a symptom of another disorder like anxiety or depression and not a separate disorder [40,41,42], while some studies have linked Internet addiction to impulsive control disorder [43,44,45,46,47], and others have suggested that IA is its own diagnosis as a primary disorder [15,47,48].

The comorbidities of IA affect the patient's life and the direction of treatment that should emphasize the psychiatric condition and treat pathological internet use [26]. A recent meta-analysis [49] comprising 1641 patients with IA and 11210 controls, demonstrated the association of IA with alcohol abuse, with attention deficit and hyperactivity (ADHD), with depression and with anxiety. The prevalence of alcohol abuse among IA was 13.3%, for ADHD it was 21.7%, for depression it was 26.3% and for anxiety it was 23.3%.

The studies recognize that IA causes damage in many social, physical and mental aspects of life, such as job loss, divorce, family disagreements, social isolation, academic failure, abandonment or expulsion from school [50,51,52], insomnia, musculoskeletal pain, tension headache, malnutrition, fatigue and blurred vision [38,53], besides cognitive impairments [54,55].

1.2 Treatments for IA

Pharmacological and psychotherapeutic treatments for Internet Addiction have been suggested [56]. The pharmacological treatment involves medicines like Escitalopram [57], Citalopram [58], Bupropion [59,60], Olanzapine [61], Quetiapine [62], Naltrexone [63], Methylphenidate [64], and Memantine [65].

Cognitive Behavioral Therapy (CBT) is an approach that teaches patients to pay attention to their thoughts, feelings and behaviors and that these dimensions have a strict relationship. The patients are trained to identify through their thoughts and feelings the triggers of addictive behaviors. Other aims of CBT are to teach different coping styles and promote adherence to treatment and the prevention of relapses [66]. CBT has been used to treat IA in many different ways [60,62,63,64,67,68,69,70]. Some researchers argued that the first stage of the treatment should be behavioral, taking into account situations where impulsivity is present [71]. Another step of treatment is focused on cognitive aspects of addiction, reducing maladaptive cognitions and promoting restructuring. Also, the real problems that led to addiction are a target of treatment at another moment and this is applied to comorbidities like depression, anxiety, addiction to drugs or alcohol, as well as other psychiatric conditions [56,72,73,74]. Modified CBT is used and has proved to be effective in treat IA [73,74,75,76,77,78].

CBT has been suggested for IA treatment in different ways: only CBT [70,71,77,78,79,80,81,82]; CBT and electroacupuncture (EA) [83,84,85,86]; CBT combined with counseling [70,87]; CBT and motivational interviewing (MI) [86]; CBT and Solution-Focused Brief Therapy(SFBT) with family therapy [88]; Cognitive or Behavioral Therapy [89]; CBT- medicine use [81,90,91,92] and a short term treatment of Internet and computer addiction(STICA) based on CBT with individuals and group interventions [78].

This aim of this research is to evaluate the effectiveness of a modified CBT protocol and medicines for the treatment of Internet addiction in patients with a range of comorbid anxiety disorders.

2. METHOD:

The research was approved by the Ethics Committee of the Federal University of Rio de Janeiro and all patients signed a consent form and were assisted at the Laboratory of Panic and Respiration at the Institute of Psychiatry of the Federal University of Rio de Janeiro (IPUB/UFRJ).

The participants were 84 patients seeking treatment for anxiety symptoms and/or Internet Addiction and at screening they responded to The Mini International Neuropsychiatric Interview 5.0; the Hamilton Anxiety Scale, the Hamilton Depression Scale, Clinical Global Impressions and the Young Internet Addiction Scale. At this time, the 42 patients who only had Internet addiction received psychoeducation on conscious internet use and were considered the first open clinical trial group, while the 42 patients in whom Internet addiction and anxiety disorder were observed were forwarded for pharmacotherapy and DELETE group to receive psychotherapy and were considered the second open clinical trial. The inclusion criteria adopted for the study were patients between 18 to 65 years, with internet addiction (the authors used a cut-off for IA diagnosis of having a score of 50 or more on an Internet Addiction Test) and anxiety disorder (diagnosed by a psychiatrist), attending and completing the initial interview and; having enough cognitive ability to understand the instructions. Patients who did not know how to read or write, or had Axis II pathology, were excluded.

2.1 Measures:

The group that received psychoeducation on conscious internet use responded the instruments only at screening moment and the group forwarded for pharmacotherapy and psychotherapy responded at the screening and at the end of psychotherapy.

Mini International Neuropsychiatric Interview (MINI 5.0)

The MINI is a short structured diagnostic interview compatible with DSM-III-R/IV and ICD-10 criteria. It was designed for clinical practice and research in psychiatric and primary care settings [93].

Young Internet Addiction Test (IAT)

This is a 20-item 6-point Likert scale: does not apply (0), rarely (1), occasionally (2), frequently (3), often (4), and always (5). The scale measures the severity of self-reported compulsive use of the internet [5].

Hamilton Anxiety Rating Scale (HAM-A)

The scale consists of 14 items scored on a scale of 0 (not present) to 4 (severe), with a total score range of 0–56, where <17 indicates mild severity, 18–24 mild to moderate anxiety and 25–30 moderate to severe [94].

Hamilton Depression Rating Scale (HDRS)

Eight items are scored on a 5-point scale, ranging from 0 (not present) to 4(severe). Nine are scored from 0-2. The sum of the scores is 0-7. From 0-7 is considered normal; 8-13 = mild depression; 14-18 = moderate depression; 19-22 = severe depression; ≥ 23 = very severe depression [95].

Clinical Global Impression (CGI)

The CGI comprises one-item measures evaluating the severity of psychopathology from 1 to 7 and change from the beginning of treatment on a similar seven-point scale [96].

2.2 Treatment

The patients were recruited through attendance of the laboratory of panic and respiration at the Institute of psychiatry of the Federal University of Rio de Janeiro, which offers treatment for anxiety disorders and for depression. 84 patients with Internet addiction, with a score above 50 on the IAT scale, were invited to participate in this study. The 42 patients who only had Internet addiction received psychoeducation on conscious internet use and bibliotherapy and were considered as the control group. The treatment was applied to 42 participants who, besides IA, had been diagnosed with anxiety disorder, using MINI and psychiatry, and as such whereas forwarded for pharmacotherapy and psychotherapy. The psychiatrists prescribed medication, taking into account involved anxiety disorder and internet addiction, on the basis that the medications used were varied antidepressants like: fluoxetine, sertraline, venlafaxine, desvenlafaxine, paroxetine, escitalopram, zolpiden and, duloxetine; anxiolytics like: clonazepam and, alprazolam; psychostimulants like methylphenidate; or antipsychotics like quetiapine. The patients were evaluated by a psychiatrist at the beginning of the treatment, a month later and successively.

The psychotherapy used was a modified CBT focused on treating anxiety and IA. The first step of treatment is directed at treating the anxiety disorder and teaching, through psychoeducation, the mechanism of anxiety and how to deal with it by learning not to be scared in situations that generate anxiety. At this moment the patients identify and understand emotions and their functioning and this relationship with internet use. All circumstantial situations are explored: social life, interpersonal relations, occupational situations related to anxiety and internet use. The second phase is for cognitive reappraisal of anxiety and internet use, whereby the patients analyze their daily internet use, the cognitions and triggers involved in the internet use and anxiety. The cognitive distortions like selective abstraction, generalization, dichotomy thinking and others that are perpetuating anxiety and excessive use of the internet are restructured. At this time, the patients understand the influence of thoughts on behaviors. The third phase is behavioral modification and involves breaking habits in the use of the internet and making different use of that broken routine.

At this point, the exposures of feared/ansiogenic situations are made and time management is trained. The behavioral modification covers social, interpersonal areas and changing ways of dealing with friends and, family and, physical activities. Even at this stage, another target was to insert positive emotion into the patient's life to boost motivation for the development of social skills in order to remove the patient from the internet and put them back in real life. The last phase of the treatment is prevention of relapse through analyzing improvement, reinforcing new beliefs and behaviors and solving problems. This treatment lasts from 8 to 10 sessions and at the beginning of the treatment and at the last attendance the participant responds to the following scales: IAT, HAM-A, HDRS and, CGI to do a follow-up of the treatment and to verify the improvement. The main criteria of improvement were the scores on IAT and HAM-A scales and especially the fact that the patients no longer had to manage anxiety using the internet.

2.3. Statistical analyses:

The data of before and after the treatment were analyzed by independent samples t-test to examine the differences between the beginning and the end of the treatment. The differences in IAT, Ham-A and HDRS scores were assessed by Pearson's correlation analysis and statistical significance was defined at the 0.05 level, two-tailed.

Means, standard deviations and estimated marginal means of the treatment group and control group were calculated by correlation matrix between anxiety, depression and internet addiction between groups. These analyses of the variables took account of pretest measures of IAT, HAM-A and HDRS of the treatment group.

3. RESULTS:

A sample of 84 volunteers participated in the clinical trial, 42 of which were diagnosed with Internet Addiction and received psychoeducation on conscious use of the internet and were considered as the control group. The other 42 patients were diagnosed with anxiety disorder and internet addiction and received treatment for anxiety disorder and internet addiction and were

considered as the treatment group. All participants had regular access to the internet at home, work and/or on a mobile phone. The treatment group characteristics for age, sex, education and occupation are presented in **Table1**. The treatment group was composed of 25 patients with PD, representing 59.45% of the sample. The disorders presented in the treatment group are described in **Table 2**.

The anxiety levels in the control group, shown by mean scores on the HAM-A suggested light anxiety in 32 of the 42 patients of the group, the average of 10.19 ± 6.96 being markedly different from the averages of the treatment group of 33.93 ± 7.67 at the beginning, suggesting severe anxiety, and 15.00 ± 5.11 at the end of treatment, suggesting mild anxiety and a significant improvement. The end score of anxiety of the treatment group is much closer to the score of the control group. The IAT scores in the control group were 58.98 ± 9.26 (the minimum considered as being problematic use is 50), which suggested problematic internet use, albeit less severe than in the treatment group, which had an average score of 67.88 ± 9.03 at the beginning of the treatment. At the end of the psychotherapy the majority of participants showed an average score of 37.79 ± 11.41 indicating a notable improvement in internet addiction. The data collected immediately after the treatment revealed that the patients who participated in the treatment group demonstrated significantly lower Internet addiction levels than participants in the control group and it is represented in the negative t value. T- tests from the beginning and the end of the treatment and from the control group are reported in **Table 3**.

The relationship between anxiety and Internet addiction was observed by a correlation matrix between these variables and the statistical results indicate that the correlation between internet addiction and depression was weak (0.534) but the correlation between internet addiction and anxiety was strong (0.722), as was the correlation between anxiety and depression (0.806). So the relationship between anxiety and internet addiction exists and is strong. The results of this relationship are reported in **Table 4**.

Improvement was noted on comparison of scores on IAT and HAM-A scales and especially in the fact that the patients no longer had to manage anxiety

using the internet and after treatment could use what they had learn in psychotherapy.

4. DISCUSSION:

Although Internet addiction is not a recognized disorder on DSM5 [2], there are a lot of studies highlighting the harmful effects of IA [40,77,97,98,100,101,102,103,104,105,106]. This research examined the efficacy of modified CBT treatment and medicine use for internet addiction and anxiety disorders and the relationship between anxiety and internet addiction.

Almost all the patients in the treatment group, especially those with panic disorder, used the internet to deal with physiological and cognitive symptoms of anxiety; the variety of apps for mobiles using music, respirations, WhatsApp, Facebook and others, as well as surfing the internet, were all used as coping strategies to face anxiety. This fact had aggravated the internet use and the anxiety in these patients and had also been observed in a previous study [108].

Our study found a higher prevalence rate among females in the treatment group, as we had 29 females and 13 males; the control group presented a 50-50 score of 21 males and 21 females. Only two studies showed this difference in prevalence rate among males and females, presenting higher rates in females [107,108], while the majority of studies found either a higher prevalence among males [100,109,110,111,112,113,114] or equal prevalence [115,116,117,118,119].

The patients who received psychotherapy and medicines were evaluated at the beginning and the end of the psychotherapy, and after 10 sessions and medication use all indicators had been reduced, proving the efficacy of the protocol of treatment. The average score for internet use at the beginning of the treatment was 67.88 ± 9.03 and at the end of the psychotherapy the majority of participants showed an average score of 37.79 ± 11.41, indicating a notable improvement in internet addiction. The levels of anxiety also showed a considerable improvement, as the average of the treatment group at beginning was 33.93 ± 7.67, suggesting severe anxiety, and at the end of treatment it was 15.00 ± 5.11, suggesting mild anxiety and a significant improvement.

Analyzing the relationship between anxiety and internet addiction, a study positively linked IA to anxiety and stress and claims that the more addicted to the internet a student is, the more stressed and anxious he/she will be [120]. Our study also found a relationship between anxiety and internet addiction (0.722).

Taking into account previous research into treatment, recent studies pointed to the fact that the most effective treatment for IA should combine cognitive-behavioral therapy and medicines [15,56,81,90,91,92]. Other interventions using CBT were also described as being successful [71,74,76,77,79]. There are other approaches that also seem to be effective, such as the multimodal behavioral program [121], in groups with individualized therapy of diaries, social skill training, and exposition training called STICA [78], a treatment called CBT-IA involving behavioral modification of internet use, cognitive restructuring and harm reduction therapy [73], motivational interviewing [86], time management skills [77] and, Solution-Focused Brief Therapy with family therapy [122]. Future studies should also investigate treatment differences among approaches like counseling, gestalt, psychodynamic therapies or even therapies from the new age of CBT such as mindfulness, metacognitive approach and transdiagnostic treatment using a unified protocol to analyze the efficacy and to offer different possibilities of treatment. The transdiagnostic treatment using a unified protocol is a protocol for treating depression and anxiety and could be an interesting option for treating IA with comorbid depression or anxiety [123].

Some limitations observed in the study were that it does not used specific tests to analyze the level of social phobia or GAD to analyze the relationship between abusive use of the internet and that specific anxiety disorder separately. This could be a future area of research and the fact that the study was not randomized in age, educational level and other aspects was also a limitation to be considered.

5. CONCLUSIONS

The aim of this study was to evaluate the efficacy of a modified CBT protocol combined with medicine treatment for patients with IA and anxiety disorder.

Another objective was analyzing the relationship between anxiety and internet addiction.

Around the world the population has became frequent internet users, in some countries this has become overuse and demands adjustment and treatment. Although Internet addiction is not a recognized disorder on DSM5, there are a lot of studies highlighting the harmful effects of Internet addiction and the urgency of promoting conscious use; this being perhaps the most important aspect of this treatment, promote and support conscious use of the internet to create a healthy relationship with this use. Conscious use of the internet involves not swapping outdoor activities for staying connected, choosing a real social life rather than a virtual one, not disturbing your mood with postings, checking if academic performance or work are being harmed, reflecting on daily habits of internet use in order to make changes, practicing physical exercises regularly, having intervals during the use of technology and cherishing family and close relationships. This study calls for further research investigating IA treatments, associations and increased promotion of conscious use of the internet.

Declaration of interests
None.

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Table 1: Sample Characteristics and baseline scores

		COMORBIDITIES GROUP	WITHOUT COMORBIDITIES GROUP
AGE		29±6.43	31.57±9.76
SEX	MALE	13 (30.95%)	21 (50.00%)
	FEMALE	29 (69.05%)	21 (50.00%)
EDUCATION	ELEMENTARY SCHOOL	0 (.00%)	5 (11.90%)
	HIGH SCHOOL	42 (100.00%)	37 (88.10%)
OCCUPATION	STUDENT/EMPLOYED	39 (92.86%)	41 (97.62%)
	UNEMPLOYED/HOUSEWIFE	3 (7.14%)	1 (2.38%)
IAT		67.88 ± 7.40	58.98 ± 7.54
HAM-A		33.93 ± 6.36	10.19 ± 5.41
HDRS		16.38 ± 5.46	5.67 ± 3.22
CGI		5.14 ± 0.61	1.43 ± 0.65

Table 2: Disorders in Comorbidities Group

Disorder	Total (Proportion %)
PD with Agoraphobia	9 (21.43%)
PD with Agoraphobia and GAD	15 (35.72%)
PD with OCD	1 (2.38%)
GAD	9 (21.43%)
GAD with ADHD,OCD, Phobia	5 (11.90%)
Social Phobia	3 (7.15%)

PD: Panic disorder; GAD: Generalized anxiety disorder; OCD: Obsessive compulsive disorder; ADHD: Attention deficit hyper- activity disorder.

Table 3: Student's t-test Comorbidities Group

	Average±SD		t-test	
	BASELINE	DEADLINE	t	p-value
IAT	67.88±7.40	37.79±8.85	14.63	< 0,001
HDRS	16.38±5.46	7.19±2.40	9.14	< 0,001
HAM-A	33.93±6.36	15.00±3.95	14.18	< 0,001
CGI	5.14±0.61	1.10±0.22	29.74	< 0,001

Table 4: Correlation matrix between anxiety, depression and internet addiction on baseline of two groups

	HDRS	HAM-A
IAT	0.534	0.722
HDRS	-	0.806

Artigo 4

A Protocol for Internet Addiction with Anxiety Disorders

Authors:

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A Protocol for Internet Addiction with Anxiety Disorders

HIGHLIGHTS

1) We described treatment of 39 patients with anxiety disorders and internet addiction. Internet Addiction is increasing around the world and effective treatments have to be developed.

2) We suggest that pharmacotherapy and Cognitive Behavior Therapy in the treatment of patients with anxiety and Internet addiction were effective strategies.

3) The patients showed improvements in anxiety symptoms and learned to manage anxiety without had to use internet for that. The treatment promoted a conscious use of internet.

4) This study is the first published research in IA treatment of a Brazilian population. The improvement was remarkable due to the complete engagement of the patients in therapy, which contributed to the success of the treatment in behavioral aspects and brought patients the confidence to continue and to manage the Internet use in their lives.

A Protocol for Internet Addiction with Anxiety Disorders

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The research was approved by the Ethics Committee of The Federal University of Rio de Janeiro and all patients signed a consent form and were assisted at the Laboratory of Panic and Respiration at the Institute of Psychiatry of the Federal University of Rio de Janeiro (IPUB/UFRJ).

A Protocol for Internet Addiction with Anxiety Disorders

Abstract

The world has watched the growth of the internet and seen how this has led to significant change in our everyday lives, becoming an integral part of modern life. The features which can be found on the internet have made life easier and provide innumerous benefits, but excessive use has brought about the potential for addiction, leading to severe impairments in social, academic, financial, psychological and work domains. Internet addicts usually have comorbid psychiatric disorders. Panic disorder (PD) and Generalized Anxiety Disorder (GAD) are prevalent mental disorders, involving a great deal of damage in the patient's life. This open trial study attempts to describe the treatment protocol of 39 patients with anxiety disorders and Internet addiction (IA) involving pharmacotherapy and modified cognitive behavioral therapy (CBT). The psychotherapy was conducted individually, once a week, over a period of 10 weeks, and results suggest that the treatment was effective for anxiety and for Internet addiction.

Key-words: Internet Addiction, Panic Disorder, Generalized Anxiety Disorder, Treatment, Cognitive Behavioral Therapy.

1. Introduction

The rapid expansion of the Internet and its integration into modern life has led to far reaching changes in our day to day existence. The facilities and the innumerous possibilities of the Internet provide considerable benefits, but excessive use has brought about the potential for addiction and caused impairments in social, academic, financial, psychological and work domains.

Internet addiction is defined as the lack of ability to control Internet use, which causes distress, is time consuming, or results in significant social problems, occupational problems or financial impairments (Shapira, 2001-2003). Psychological disturbances like loneliness, low self-esteem, poor coping capacity, anxiety, stress and depression are also present (Beard & Wolf, 2001; Brezing et al., 2010; Cash et al., 2012). Aggressive behavior can also be related to excessive internet use (Yen at al., 2010).

Internet addiction is not a recognized disorder on DSM5 (APA, 2013), and there is no consensus on diagnosis criteria; though some researchers suggest features such as salience, mood modification, tolerance, withdrawal, conflict and relapse; arguing that the addictions share elements of biopsychosocial processes (Griffiths, 2005). Other often used diagnosis criteria, based on modified criteria for pathological gambling, take into account: excessive preoccupation with the Internet; the need to use the Internet for increasing periods of time; unsuccessful efforts to control Internet use; feeling restless, moody, depressed or irritable when attempting to cut down Internet use; staying online longer than originally intended; loss of a significant relationship, job or educational opportunity; lying to others to conceal the extent of involvement with the Internet and using the Internet as a way of escapism from problems or

to relieve a dysphoric mood. It is considered addiction when five or more criteria are present over a 6-month period (Young, 1996; Young, 2004).

In function of not having official diagnosis criteria, researchers validate several instruments to assess IA, and the international prevalence rate varies greatly. The most used questionnaires are: the Young Internet Addiction Test (IAT) (Young; 1998b); the Compulsive Internet Use Scale (CIUS) (Meerkerk et al., 2009), the Internet Consequences Scale (Clark et al., 2004), the Excessive Internet Use Scale (EIU) (Johansson; 2004), the Problematic Internet Use Questionnaire (PIUQ) (Demetrovics, Szeredi & Rózsa, 2008), the Chen Internet Addiction Scale (CIAS) (Chen, et al., 2003), The Addiction Profile Index Internet Addiction Form - Screening Version (BAPINT-SV) (Ogel, Karadag & Satgan, 2012), the Internet Addiction Proneness Scale (KS scale) (Kim et al., 2008) and Young's Diagnostic Questionnaire(YDQ) (Young, 1996). Accordingly, the worldwide prevalence rates of IA differ widely and range, approximately, from 1.0% to 18.7 % (Pontes, Kuss & Griffiths, 2015).

Anxiety Disorders share features of excessive fear and anxiety and related behavioral disturbances. The symptoms cause significant distress in social, occupational or other areas of functioning. Panic Disorder concerns recurrent unexpected panic attacks that are characterized by an abrupt surge of intense fear that reaches a peak in minutes, accompanied by physical and cognitive symptoms like palpitations, sweating, chest pain, fear of losing control, fear of dying, trembling, nausea and others. Generalized Anxiety Disorder concerns excessive anxiety and worry about daily activities that the patient finds difficult to control and is associated with being easily fatigued, irritability, muscle

tension, sleep disturbance, difficulty concentrating and restlessness (DSM5, 2013).

People with multiple dependencies such as alcohol, cigarettes, drugs, food and sex have a higher risk of developing IA because they have learned to deal with anxiety and difficulties through compulsive behavior (Young et al., 2011). Internet addicts usually have comorbid psychiatric disorders and this association aggravates internet use; this relationship between IA and several psychiatric disorders is significant and has awakened academic interest. Researchers have linked IA with: Depression (Young & Rogers,1998; Ha et al., 2007; Morison and Gore, 2010; Orsal et al., 2013); Attention Deficit and Hyperactivity (Yen et al., 2007; Yen et al., 2009; Yen et al., 2014); Generalized Anxiety Disorder and Social Anxiety Disorder (Bernardi & Pallanti, 2009; Carli et al., 2013); Dysthymia (Bernardi & Pallanti, 2009); Alcohol use disorder (Ko et al., 2006); Eating disorder (Tao & Liu, 2009); Obsessive compulsive personality disorder, Borderline personality disorder and Avoidant personality disorder (Bernardi & Pallanti, 2009); Social phobia (Yen et al., 2007; Adalier, 2012) and Insomnia (Cheung & Wong, 2011). Another important point under discussion is the fact that IA could be a symptom of another disorder like anxiety or depression and not a separate disorder (Kratzer & Hegerl, 2008; Cash et al., 2012), while some studies have likened Internet addiction to impulsive control disorder (Beard & Wolf, 2001; Shapira et al., 2003; Aboujaoude et al., 2006; Block, 2008), and other researchers have suggested that IA is its own diagnosis as a primary disorder (Young, 1998; Pies, 2009).

These comorbidities have an important role in the treatment of IA, which should emphasize the psychiatric condition and treat abusive internet use

(Young & Rogers, 1998). The studies highlight that IA causes damage in social, physical and mental aspects of life, generating job loss, divorce, family disagreements, social isolation, academic failure, abandonment or expulsion from school (Mythily, Qiu & Winslow, 2008; Wang et al., 2012), insomnia, musculoskeletal pain, tension headaches, malnutrition, fatigue and blurred vision (Cheung & Wong, 2011), and cognitive impairments like inattention, difficulty concentrating, procrastination and incomplete tasks (Davis, 2001; Kaneez, et al., 2013).

1.1 Treatments

Some pharmacological (Han & Renshaw, 2012; Paik, Oh & Kim, 2014), and psychotherapeutic (Young, 2009; Young, 2011; Jäger et al., 2012; Cash et al., 2012; Young, 2013; King, Nardi & Cardoso, 2014) treatments have been proposed and recommended for IA both separately and together (Przepiorka et al., 2014). Substantial addiction and IA can share the same neurobiological mechanism, so in this sense the addictive behavior medications can help other dependences (Brezing, et al., 2010). Medicines like Escitalopram (Dell'Osso et al., 2008), Citalopram (Sattar & Ramaswamy, 2004), Bupropion (Han et al., 2010; Han & Renshaw, 2012), Olanzapine (McElroy et al., 2008), Quetiapine (Atmaca, 2007), Naltrexone (Bostwick & Bucci, 2008), Methylphenidate (Han et al., 2009), and Memantine (Camardese et al., 2012) have all been used to treat IA.

CBT has been shown to be effective in treating IA and has been suggested in many studies (Hall & Parsons, 2001; Sato, 2006; Young, 2009; King et al., 2011; Young, 2011). CBT highlights the relationship between thoughts, emotions and behaviors; teaching patients to pay attention to these and to be

ready to identify the addictive behavior triggers through their thoughts and feelings. A CBT psychotherapist teaches coping styles, promoting adherence to treatment, changing behavior and preventing relapses (King et al., 2011). As a treatment for IA some researchers have suggested traditional CBT (Young, 2009; Siomos et al., 2010; Ge, et al., 2011; Jäger et al., 2012; Wolfing et al., 2012; Li & Wang, 2013); CBT and Counseling (Fang-ru & Wei, 2005); CBT with electroacupuncture (EA) (Zhu et al., 2009; Zhu et al., 2012); CBT and solution-Focused Brief Therapy (SFBT) with family therapy (Rong et al., 2005); CBT and motivational interviewing (MI) (van Rooiji et al., 2012); CBT and medicine use (Wolfing et al., 2012; Siomos et al., 2010, Santos, Nardi & King, 2015); Cognitive or behavioral Therapy (Kim et al.,2012) and a modified CBT program called short term treatment of Internet and computer addiction (STICA) with individuals and group interventions (Jäger et al., 2012).

Reality therapy (RT) is also used to treat IA. In this approach the addicts are responsible for their choices and for being addicted to the internet. The therapy reinforces the idea that patients can choose to change their attitudes and thoughts (Huang et al., 2010). Group psychotherapy and hospitalization for detoxification are also models of treatment for IA (Yen et al., 2010), besides which multimodal approaches using CBT, psychotherapy with families, treatment of comorbidities, medications and hospitalization are also suggested (Dowling & Brown, 2010).

Therefore, the main objective of this longitudinal study is to test the efficacy of a treatment for PD or GAD and Internet addiction involving pharmacotherapy and modified cognitive behavioral therapy. A secondary aim is to produce clinical research data to corroborate the recognition of Internet

addiction as a behavioral addiction and ascertain the nature of the relationship between anxiety disorders and internet addiction.

2. Methods

The inclusion criteria adopted were: patients between 18 to 65 years with internet addiction, the cut-off used for IA diagnosis was having a score of 50 or more on an Internet Addiction Test; a diagnosis of Panic Disorder or Generalized Anxiety Disorder by MINI and confirmed by a psychiatrist; attending and completing the initial interview; and having enough cognitive ability to understand the instructions. Patients who did not know how to read or write, or had Axis II pathology, were excluded.

All patients signed a consent form approved by the Ethics Committee of the Federal University of Rio de Janeiro and were assisted at the Laboratory of Panic and Respiration at the Institute of Psychiatry of the Federal University of Rio de Janeiro (IPUB/UFRJ).

These patients were seeking treatment for anxiety symptoms. At screening they responded to the following scales: MINI 5.0 (Sheehan, et al., 1998) the Hamilton Anxiety Scale (Hamilton, 1959), the Hamilton Depression Scale (Hamilton, 1960), Clinical Global Impressions (Guy, 1976) and the Young Internet Addiction Scale (Young, 1998). At this time Internet addiction was observed taking into consideration the IAT scale, with a score above 50, while the anxiety disorder was diagnosed by a psychiatrist. Patients were then invited to participate in this study and were forwarded for pharmacotherapy and modified CBT protocol.

The patients were evaluated by a psychiatrist at the beginning of the treatment, were allowed to take medications and were accompanied by psychiatrist throughout the treatment.

Psychotherapy Protocol

All 39 patients underwent psychotherapy of modified CBT which was conducted once a week for 10 weeks. The focus was to teach the patients how to deal with anxiety symptoms without using the internet for this and to promote conscious use of the internet. This psychotherapy followed four phases: psychoeducation of anxiety and internet use, cognitive reappraisal, behavioral modification and prevention of relapse **Table 1.**

Phase 1:

The first phase of psychotherapy lasts 3 sessions and is focused on psychoeducation of the anxiety mechanism, identifying frightening situations and the triggers that increase anxiety and problematic Internet use. The focus is on teaching breathing retraining through breathing exercises and strategies, without using the internet to deal with anxious thoughts and situations. During this phase the patients learn to identify and accept emotions and to stop fighting with anxiety. The patient comes to understand the anxiety and its relationship with internet use through self-monitoring of internet use during situations involving anxiety. Other maintenance factors related to internet abuse and anxiety are also explored. These factors can include personal, situational, social, psychiatric or occupational conditions.

Phase 2:

The second phase is for cognitive reappraisal of anxiety and internet use. At this stage the patients think about their daily internet use and the cognitions

involved in this use and anxiety. Cognitive distortions are identified and the patient comes to understand that distortions like: "just a few more minutes on the internet won't do me any harm" "I have to answer my friends immediately, otherwise they will not forgive me" "If my friends don't give "likes" on my posts or my photos it is a signal that they don't like me or that I did something wrong" "If I disconnect from the internet I will miss important things because the best things are on the internet" contribute to the excessive use of the internet. All thoughts related to anxiety and internet use are restructured and new thoughts are proposed, generating alternative beliefs in 2 sessions.

Phase 3:

The third phase (3 sessions) is behavioral modification with exposure to feared/ansiogenic situations and time management training, with a diary of internet use being proposed. This behavioral modification involves breaking routines in the use of the internet to do things differently. Breaking these habits involves changing ways of dealing with family, friends, social activities, physical exercises and other aspects of life, analyzing all components of the situations in order to replace or remove components to do things differently and successfully break the old way of functioning. Another important element of this stage is to insert positive emotions into daily activities to develop social skills, so as to promote less internet usage and more real interactions. According to Positive Psychology, enhancing positive emotion increases resilience, helping to reduce signs and symptoms of anxiety and depression and prevent relapses (Wood, 2010).

Phase 4:

This phase lasts 2 sessions and the focus is on continued recovery and relapse prevention by reinforcing new beliefs and behaviors and social skills like assertiveness, problem solving, verbal communication and empathy. The achievements/ improvements are registered on a card (achievement card) and the patient is encouraged to continue putting into practice what they have learned in psychotherapy. In the last session, the volunteer again responded to the scales (IAT, HAM-A, HAM-D and CGI) that had been responded to at the beginning of the treatment, to do a follow-up of the treatment to verify the improvement on the scale score. Besides the improvement on scale scores, other important criteria of improvement are the time spent on the internet, the recovery of real interactions and especially the fact that the patients no longer need to use the internet to escape problems or manage anxiety.

3. Results

This open trial study proposes pharmacological and psychotherapeutic intervention to treat patients diagnosed with panic disorder or generalized anxiety disorder and internet addiction. Initially, 41 patients fulfilled the criteria and were selected to receive psychotherapy treatment for PD or GAD and IA, but two of them didn't take the treatment forward. These were a 33-year-old man, who was a taxi driver with PD and IA that moved to another state after the third session, and a 36 year-old woman with other diagnoses, like eating disorder and recurrent depression, besides panic disorder and internet addiction, who attended only two sessions of psychotherapy. The other 39 patients attended the sessions until the end and the characteristics for sex, age, marital status, education and occupation are presented in **Table 2**.

The psychiatrists prescribed medications to treat Panic Disorder or Generalized Anxiety Disorder and Internet Addiction. Some of the medications used were antidepressants like Fluoxetine, Sertraline, Venlafaxine, Desvenlafaxine, Paroxetine, Escitalopram, Zolpiden and Duloxetine; anxiolytics like Clonazepam and Alprazolam; psychostimulants like Methylphenidate and antipsychotics like Quetiapine.

Of the 39 patients, 25 were diagnosed with PD and 14 with GAD, besides internet addiction. Before the treatment, the anxiety levels on HAM-A suggested severe anxiety, with an average of 34.26 ± 6.13, but after the treatment the average was 15.03 ± 3.88. The IAT average score, indicating internet addiction, at the beginning of treatment was 67.67 ± 7.69, showing problematic internet use, while after the sessions the average IAT score was 37.56 ± 9.32, indicating medium internet use and a significate improvement in addiction. The HDRS scores at the baseline suggested mild depression, 16.72 ± 5.56, whereas after treatment the scores were 7.28 ± 2.52, indicating no depression. The t values from the treatment are reported in **Table 3.**

Taking into account the relationship between internet addiction and anxiety, according to the statistical correlation matrix, this correlation exists (0.724), as does the correlation between anxiety and depression (0.815) and between internet addiction and depression (0.535). The correlations are reported in **Table 4**.

At the end of the psychotherapy all of the patients felt very positive about their treatment and were very confident, having recovered their social lives. The patients showed improvements in anxiety symptoms and managing anxiety without having to use the internet to do so. The Internet use after treatment

became conscious use and all the patients were classified as mild users. These achievements show that the patients were able to recover healthy functioning.

4. Discussion:

In the present research the authors described a protocol of modified cognitive behavior therapy treatment, examined the effects of this and pharmacotherapy on the treatment of 39 patients with Panic Disorder/ Generalized Anxiety Disorder and Internet addiction and analyzed the relationship between anxiety and internet addiction. Despite the controversy over recognition of IA as an official disorder, the harmful effects of this behavioral addiction are highlighted in several studies (Jap, et al., 2013; Ko et al., 2008; Muñoz Rivas et al., 2010; Park et al., 2012; Shek, Tang & Lo, 2009; Sun et al., 2012). The psychotherapy protocol was effective in the treatment of anxiety and internet addiction, since all the patients learned to manage anxiety without the internet and showed conscious use at the end of the sessions.

Several studies corroborate the association between depression and internet addiction (Young & Rogers, 1998; Yen et al., 2007; Ha et al, 2007; Morison & Gore, 2010; Orsal et al., 2013; Carli et al., 2013), but few studies explore the association between anxiety and internet addiction (Bernardi & Pallanti, 2009; Pezoa-Jares et al, 2012; Berner et al., 2014). Although imaging studies point out that the functioning of internet addiction is more connected to impulse control disorder and that through magnetic resonance imaging it is possible to identify that the areas activated when an internet addict has the urge to use it are the same areas activated by addictive substances at the time of the fissure (Yen, Yen & Ko, 2010), anxiety plays an important role in increasing

internet usage and strengthening the addiction. The authors highlighted this relationship between anxiety disorders and IA through a statistical correlation matrix (0.724) and that the anxiety beliefs and behaviors have an important impact on Internet use and contact with the world.

Previous treatments for IA have been described in the available literature and many of them use CBT as a psychotherapeutic approach (Hall & Parsons, 2001; Young, 2007; Duet al., 2010; Ge et al., 2011; Young, 2013); CBT and medicines (Kim et al., 2012; Siomos et al., 2013; Santos et al., 2015); or multimodal programs involving individual and group therapy, counselling and family therapy (Goldsmith & Shapira, 2006; Jäger et al., 2012; Wölfling et al., 2014).

A limitation of the study was the small sample size of 39 participants, but results showed the effectiveness of the proposed treatment, both in reducing symptoms of anxiety and promoting healthy internet use, improving internet addiction in the patients. This study is important because there is no published research on IA treatment of a Brazilian population.

Future research should identify possible treatments of IA using new strategies and approaches, such as gestalt, counselling, family therapy, mindfulness, psychodynamic therapies, positive psychology and transdiagnostic treatment. There should also be investigation and analysis to develop new treatments that could be offered to society for specific populations in which internet addiction has a harmful impact; like couples with marital problems, people who suffer from insomnia, people with attention deficit disorder and people with other addictive behaviors, such as smoking, drug use, eating, sex or shopping.

Conclusion:

Our findings suggest that pharmacotherapy and the developed protocol of psychotherapy in the treatment of patients with anxiety and Internet addiction were effective strategies.

The improvement was remarkable due to the complete engagement of the patients in therapy, which contributed to the success of the treatment in behavioral aspects and brought patients the confidence to continue and to manage the Internet use in their lives.

Internet addiction is increasing around the world and in some countries, like South Korea and China; it is considered a public health condition. In this sense, effective treatments have to be proposed and reported in order to promote conscious use of the internet that involves putting value on family, friends, social life, and physical exercises; always thinking about internet use so as not to become abuse, using interaction over the internet to reinforce and expand real interactions.

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Table 1 – Description of Psychotherapy

Phase	Description
Phase 1 (3 sessions)	Psychoeducation of anxiety (PD or GAD) and internet use, identifying triggers that increase anxiety and Internet use. Breathing retraining, breathing exercises and strategies to manage anxiety without using the internet. Maintenance factors: personal, situational, social, psychiatric or occupational conditions.
Phase 2 (2 sessions)	Cognitive reappraisal of anxiety and internet use. Daily internet use and the cognitions involving this use and anxiety. "Just a few more minutes on the internet won't do me any harm" "I have to answer my friends immediately, otherwise they will not forgive me" "If my friends don't give "likes" on my posts or my photos it is a signal that they don't like me or that I did something wrong" "If I disconnect from the internet I will miss important things because the best things are on the internet"
Phase 3 (3sessions)	Behavioral modification, breaking routine in the use of the internet. Training time management with a diary of internet use, changing ways of dealing with family, friends, social activities, physical exercises and other aspects of life. Insert positive emotion into daily activities to develop social skills to promote less internet usage and more real interactions.
Phase 4 (2 sessions)	Reinforcement of continued recovery and relapse prevention through new beliefs and behaviors, social skills like assertiveness, problem solving, verbal communication and empathy. Achievement card. Follow-up of scales.

Table 2- Sample Characteristics

Sample Characteristics N=39	
Age	28.56±5.93 (19-42)
Sex	
Female	27 (69.23%)
Male	12 (30.77%)
Education	
Elementary School	10 (25.64%)
High School	29 (74.36%)
Marital Status	
Single	28 (71.79%)
Married	10 (25.64%)
Widow	1 (2.56%)
Occupation	
Student/ Employed	36 (92.30%)
Unemployed/ Housewife	3 (7.70%)

Table 3: Student's t-test

	Average±SD		t-test	
	BASELINE	DEADLINE	t	p-value
IAT	67.67±7.69	37.56±9.32	13.61	< 0.001
HDRS	16.72±5.56	7.28±2.52	8.94	< 0.001
HAM-A	34.26±6.13	15.03±3.88	13.62	< 0.001
CGI	5.15±0.65	1.10±0.24	27.62	< 0.001

Table 4: Correlation matrix between anxiety, depression and internet addiction

	HDRS	HAM-A
IAT	0.535	0.724
HDRS	-	0.815

DISCUSSÃO

A partir do conjunto de estudos presentes nesta dissertação, é possível levantar hipóteses sobre o uso abusivo de internet e sua relação com a ansiedade. Adicionalmente, fornece dados para aumento de eficácia de tratamentos psicológicos desenvolvendo um protocolo de atendimento para transtornos de ansiedade e DI.

Embora o foco no primeiro artigo publicado fosse o tratamento da depressão, a revisão contribuiu analisando estratégias que foram utilizadas no protocolo de tratamento desenvolvido e analisado nos outros artigos. Os artigos 2, 3 e 4 foram desenvolvidos no sentido de produzir maior entendimento dos aspectos conceituais, manifestações clínicas, aspectos psicológicos e comportamentais associados ao uso abusivo de internet, computador e telefone celular e suas relações com os transtornos psiquiátricos, principalmente com os transtornos ansiosos.

Quase todos os pacientes submetidos ao tratamento utilizavam a internet para lidar com sintomas fisiológicos e cognitivos de ansiedade. Os pacientes recorriam a uma variedade de aplicativos para celulares utilizando música, respiração, *WhatsApp*, *Facebook*, *Instagram*, bem como navegavam na internet para enfrentar a ansiedade. Este fato agravou a utilização da internet e a ansiedade nesses pacientes.

O tratamento combinado de medicação e psicoterapia e o protocolo desenvolvido se mostraram eficazes para tratar ansiedade e DI, uma vez que todos os pacientes tiveram uma diminuição expressiva dos sintomas ansiosos e aprenderam a manejar a ansiedade fora da internet recuperando vida social e apresentando uso consciente ao final do tratamento. Poucos ensaios clínicos que desenvolvem modelos de tratamento para a dependência de internet foram publicados e nesse sentido o estudo clinico aberto e o protocolo de tratamento descrito nos artigos 3 e 4 ajudam a produzir respaldo clinico para propostas de tratamento eficazes e para o reconhecimento da dependência de internet como uma dependência comportamental.

Nosso ensaio clínico aberto encontrou uma taxa de prevalência mais elevada entre as mulheres no grupo com comorbidades (29 mulheres para 13 homens); e no grupo sem comorbidades apresentou prevalência igual para homens e mulheres. Somente dois estudos mostraram essa diferença na taxa de prevalência entre homens e mulheres, apresentando taxas mais elevadas em mulheres,[36,37] enquanto a maioria dos estudos encontraram uma maior prevalência entre homens [38,39,40,41,42,43] ou igual prevalência.[44,45,46,47,48]

Várias pesquisas corroboram a associação de depressão e DI e classificam a DI como transtorno de controle do impulso não levando em consideração o papel da ansiedade. Poucos estudos exploram a associação de DI e ansiedade. O aspecto impulsivo da dependência de internet não é negligenciado ou contestado, mas verificamos que a ansiedade também desempenha papel importante aumentando o uso da internet e fortalecendo a dependência. Destacamos a relação entre transtornos de ansiedade e DI através da matriz de correlação estatística (0.724) e verificamos que crenças e comportamentos ansiosos têm importante impacto na DI. É fundamental que mais estudos sobre a relação da ansiedade com a dependência de internet sejam produzidos, assim como, pesquisa clínica avaliando tratamento, curso, manifestações clínicas da dependência de internet em populações especificas continuem sendo desenvolvidas. O número de pacientes que sofrem de DI que precisam de ajuda profissional aumenta e a polêmica em torno de se reconhecer ou não a dependência de internet como um transtorno oficial tem por base pouca evidência empírica.

Algumas limitações observadas foram o fato dos estudos não terem sido randomizados em idade, escolaridade e outros aspectos. O pequeno tamanho da amostra também pode ser considerado uma limitação assim como o fato de não termos utilizados algumas escalas específicas para mensuração do TP, TAG ou da Fobia Social para uma análise da relação da DI com esses transtornos separadamente. Outra limitação importante a ser destacada foi a ausência de um grupo controle.

CONCLUSÃO

Os estudos realizados nesta dissertação poderão contribuir para maior entendimento clínico da dependência de internet e desenvolvimento de critérios diagnósticos e protocolos terapêuticos.

Através dos resultados relatados nos artigos verificamos que o protocolo de psicoterapia desenvolvido foi eficaz para tratar ansiedade e a DI, uma vez que todos os pacientes aprenderam a manejar a ansiedade fora da internet, apresentaram comportamento de uso consciente da mesma ao final do atendimento e se mostraram confiantes para continuar e gerenciar o uso da Internet em suas vidas. O uso consciente da internet envolve não trocar atividades ao ar livre para permanecer conectado, escolher relações sociais reais em vez de virtuais, não perturbar o humor com postagens, verificar se o desempenho acadêmico ou no trabalho está sendo prejudicado, pensar sobre os hábitos diários de uso da internet, praticar exercícios físicos regularmente, promover intervalos durante o uso da tecnologia e valorizar família e relacionamentos íntimos.

Este estudo é pioneiro em pesquisa clinica de tratamento para DI em população brasileira e chama atenção para necessidade de futuras pesquisas investigando tratamentos para DI e maior promoção do uso consciente da internet.

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