Universidade Federal do Rio de Janeiro

Instituto de Psiquiatria

Programa de Pós-Graduação em Psiquiatria e Saúde Mental

# DISSERTAÇÃO DE MESTRADO

# A relação da qualidade de vida com o Transtorno Depressivo Maior e a Dependência da Internet

Dissertação de Mestrado apresentada ao Programa de Pós - Graduação em 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 relação da qualidade de vida com o Transtorno Depressivo Maior e a Dependência da Internet

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A família, ao marido

Sergio Superchi e

Delete – Uso Consciente de Tecnologi@s

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# Sumário

Folha de rostoI
Ficha catalográficaII
SumárioVI
Lista de Abreviaturas, símbolos e siglasVII
ResumoVIII
AbstractX
1-Introdução01
2- Artigo1: Cognitive behavioral terapy treatment for smoking alcoholics
In outpatients05
3- Artigo 2: The complex relationship between depression and Internet
Addiction19
4- Artigo 3: Can depressive disorder contribute to dependence on the internet?Case report33
5- Artigo 4: Validation of the scale for assessing depression and its relation to technology dependence45
6- Artigo 5:The relationship of quality of life with the major depressive disorder and internet addiction64
7- Discussão88
8-Conclusão90
9- Referências92

# Lista de Abreviaturas, Símbolos e Siglas:

- MINI- Entrevista Diagnóstica Neuropsiquiátrica Estruturada DSM
- IAT- Internet addiction Test
- HAM-A Escala Hamilton de Ansiedade
- HAM-D Escala Hamilton de Depressão
- CGI-S Clinical Global Impression- Severity
- CGI-I Clinical Global Impression- Improvement
- WHOQOL- Qualidade de vida-Versão Breve
- DSM-5 Diagnostic Statistical Manual of and mental Disorders-

Fifth edition

- TDM Transtorno Depressivo Maior
- DI Dependência da Internet
- TCC Terapia Cognitivo Comportamental
- IPUB Instituto de Psiquiatria
- UFRJ Universidade Federal do Rio de Janeiro

**Resumo:** As tecnologias nos dias atuais proporcionam aos indivíduos melhoras expressivas na vida cotidiana em diferentes aspectos (social, acadêmico, profissional). Por outro lado os indivíduos podem desenvolver um uso abusivo das tecnologias na medida em que as mesmas tornam-se a saída para lidar com os sintomas (apatia, baixa autoestima, tristeza, desmotivação entre outros) do Transtorno Depressivo Maior (TDM). Podemos dizer que a relação do indivíduo com a tecnologia pode interferir negativamente na sua qualidade de vida.

De acordo com Organização Mundial da Saúde (OMS) até 2020 a depressão será a principal doença mais incapacitante em todo mundo. Atualmente, mais de 350 milhões de pessoas sofrem de depressão no mundo.

A dissertação é composta de artigos como primeira autora (5) e como coautora de outros (9) que serão descritos a seguir: No primeiro artigo, intitulado "Cognitive behavioral therapy in treatment for smoking alcoholics in outpatiens" observamos que a terapia cognitivo comportamental (TCC) mostrou ser eficaz para o tratamento do tabagismo em pacientes alcoolistas no ambulatório.

O segundo artigo "The complex relationship between depressive disorder and dependency " of internet abordou a associação dos sintomas do TDM com a dependência da internet (DI) mostrando que o TDM foi significativo para intensificar a dependência da internet.

O terceiro artigo "Can depressive disorder contribute to dependence on the internet? Case report" relatou o caso de uma paciente com TDM e DI que ao final do tratamento apresentou uma redução expressiva tanto do TDM quanto o a DI.

O quarto artigo "Validação da escala para avaliar a depressão e a relação com a dependência de tecnologias", teve como objetivo criar um instrumento de avaliação específico que pudesse auxiliar nas futuras pesquisas com esse tema.

O quinto artigo The relationship of quality of life with major depressive disorder and internet addiction é a principal pesquisa da Dissertação de Mestrado que teve como objetivo avaliar a relação do TDM com a DI (computador/internet e rede sociais) e o impacto na qualidade de vida dos indivíduos na sociedade contemporânea.

Nesse estudo consideramos a hipótese de que as 8 sessões específicas de TCC desenvolvidas especificamente para esta pesquisa poderia contribuir para a redução do TDM, DI e melhora da qualidade de vida.

Os resultados deste estudo mostram que houve uma redução dos sintomas do TDM e DI mudando a relação entre eles, ou seja, a melhora do quadro do TDM proporcionou uma redução significativa da DI. Então, podemos dizer que a melhora do indivíduo do TDM reflete diretamente na dependência da internet, já que a mesma deixa de ser o recurso usado pelo indivíduo para enfrentar os sintomas depressivos.

Palavras chaves transtorno depressivo maior, dependência da internet, terapia cognitivo comportamental., qualidade de vida

**Abstract**: Present day technologies provide to individuals significant improvements in different aspects of everyday life (social, academic, professional). On the other hand, individuals may develop an abusive use of the technologies insofar as the technologies become the outlet for dealing with the symptoms of MDD (apathy, low self-esteem, sadness, lack of motivation, etc.). We can say that the relation of the individual with the technology can interfere negatively in their quality of life.

According to the World Health Organization (WHO) by 2020, depression will be the most disabling disease in the world. Today, more than 350 million people suffer from depression in the world.

The dissertation is composed of articles as first author (5) and as coauthor of other articles (9) that will be described as follows: in the first paper, "Cognitive behavioral therapy in the treatment for smoking in outpatients", we observed that cognitive behavioral therapy (CBT) was shown to be effective.

The second paper, "The complex relationship between depressive disorder and dependency of the Internet" - approached the association of the symptoms of MDD with the dependency of the Internet (ID) showing that MDD was significant to intensify the dependency of the Internet.

The third paper, "Can depressive disorder contribute to dependency on the Internet? Case Report" is a case report of a patient with MDD and ID who at the end of the treatment presented an expressive reduction of both MDD and ID.

The fourth paper "Validation of the scale to evaluate depression and the relation with the dependency of technologies" was about creating a specific evaluation instrument that could help us in future research with this theme. . The fifth paper - "The relationship of quality of life with major depressive disorder and internet addiction " - is the main study of my Master's Dissertation which aimed to evaluate the relationship of MDD with ID (computer / internet and social networks) and the impact on the quality of life of individuals in contemporary society.

In this study we consider the hypothesis that the 8 specific CBT sessions specifically developed for this study could contribute to the reduction of MDD and ID and improve quality of life.

The results of this study show that there was a reduction in the symptoms of MDD and ID changing the relation between them, that is, the improvement of the MDD picture provided a significant reduction of the ID. Therefore we can say that the improvement of the individual of MMD reflects directly on the dependence of the Internet, since the Internet is no longer the resource used by the individual to face the depressive symptoms.

Keywords: major depressive disorder, internet addiction, Cognitivebehavioral therapy, quality of life.

# Apresentação

Nesta apresentação cito todos os trabalhos dos quais participei como primeira autora e co autora em artigos e capítulo de livro. Sendo:

1-Cognitive behavioral therapy treatment for smoking alcoholics in outpatients. Flávia Melo Campos Leite Guimarães<sup>1</sup>; Antonio Egidio Nardi<sup>2</sup>; Adriana Cardoso<sup>2</sup>; Alexandre Martins Valença<sup>2</sup>; Eduardo Guedes da Conceição<sup>2</sup>; Anna Lucia Spear King.<sup>2</sup> Medical Express. 2014;1(6):336-340.

2-Artigo The complex relationship between depression and Internet addiction.Guimarães FMC<sup>I,II</sup>, Guedes E, Pádua MSKL, Santana AS, Gonçalves LL<sup>I</sup>, Nardi AE, King ALS<sup>I,II</sup>.

3-Can depressive disorder contribute to dependence on the internet? Case report. Guimarães FMCL<sup>1</sup>, King ALS<sup>2</sup>, Nardi AE<sup>3</sup>

4-Validation of the scale for assessing depression and its relation to technology dependence. (EDDT).Flávia Leite Guimarães<sup>I</sup>; Eduardo Guedes<sup>I</sup>; Mariana King Pádua<sup>I</sup>; Lucio Lage Gonçalves<sup>I</sup>; Hugo Kegler dos Santos<sup>II</sup>; Douglas Rodrigues<sup>II</sup>; Antonio Egidio Nardi<sup>I</sup>; Anna Lucia Spear King<sup>I</sup>.

5-The relationship of quality of life with the major depressive disorder and internet addiction.Guimarães FMCL,<sup>1,II</sup> Guedes E<sup>I</sup>, Santos HK<sup>II</sup>, Pádua MSKL<sup>1,II</sup> Campos CM<sup>I</sup> Gonçalves LL,<sup>1</sup> Nardi AE<sup>I,II</sup>, King ALS<sup>1,II</sup>.

6-Social networking, a new online addiction: a review of Facebook and other addiction disorders. Guedes E, Nardi AE, Guimarães FMC, Machado S, King ALS. Medical Express 2016, 3 (1): M 160101. DOI: 10.5935.

7-Internet abuse and dependence on Facebook users: How big is the population under these conditions and how it has evolved?Guedes E, Nardi AE, Pádua MSKL, Guimarães FMCL, Campos CMRS, Nascimento RLF, King ALS.

8-Validação da escala para avaliar prejuízos físicos relacionados ao uso abusivo de tecnologias no cotidiano (EPFUAT). Mariana King Pádua ; Anna Lucia Spear King <sup>;</sup> Eduardo Guedes<sup>;</sup> Flávia Leite Guimarães ; Hugo Kegler dos Santos, Douglas Rodrigues, Lucio Lage Gonçalves, Antonio Egidio Nardi

9-Validação da escala para avaliar a dependência do telefone celular (EDTC). Anna Lucia Spear King, Mariana King Pádua, Eduardo Guedes, Flávia Leite Guimarães, Lucio Lage Gonçalves, Hugo Kegler dos Santos, Douglas Rodrigues, Antonio Egidio Nardi.

10-Validação da escala para avaliar a Dependência Digital de Empregados EDDE).Lucio Lage Gonçalves ; Antonio Egídio Nardi; Eduardo Guedes; Hugo Kegler dos Santos; Mariana King Pádua ; Flavia Leite Guimarães; Douglas Rodrigues; Anna Lucia Spear King.

11- Validação da escala para avaliar a Dependência do Jogo Patológico Digital (EDJPD). Anna Lucia Spear King, Mariana King Pádua, Eduardo Guedes, Flávia Leite Guimarães, Lucio Lage Gonçalves, Hugo Kegler dos Santos, Douglas Rodrigues, Antonio Egidio Nardi.

12- Validação da escala para avaliar a Dependência do Facebook (EDF). Eduardo Guedes, Mariana King Pádua, Hugo Kegler dos Santos, Douglas Rodrigues, Lucio Lage Gonçalves, Flávia Leite Guimarães, Antonio Egidio Nardi, Anna Lucia Spear King.

13-Validação da escala para avaliar o uso abusivo de tecnologias (Computador, telefone celular, tablet, entre outras) (EUAT). Anna Lucia Spear King, Mariana King Pádua, Eduardo Guedes, Flávia Leite Guimarães, Lucio Lage Gonçalves, Hugo Kegler dos Santos, Douglas Rodrigues, Antonio Egidio Nardi 14-Validação da escala para avaliar a dependência do Whats App (EDWA) Anna Lucia Spear King, Mariana King Pádua, Eduardo Guedes, Flávia Leite Guimarães, Lucio Lage Gonçalves, Hugo Kegler dos Santos, Douglas Rodrigues, Antonio Egidio Nardi.

E ainda, participei com uma das autoras do um capítulo intitulado "O jogo patológico no computador e no telefone celular. Novas mídias para o mesmo transtorno?" conjuntamente com a autora Moema dos Reis. Este capitulo integra o livro Nomofobia - Dependência do computador, internet, redes sociais? Dependência do telefone celular? O impacto das novas tecnologias no cotidiano dos indivíduos que abrange os aspectos: Clínico, cognitivo-comportamental, social e Ambiental da editora Atheneu/RJ.

# Introdução

Vou fazer um capitulo sobre três pontos: uso das tecnologias na atualidade, terapia cognitivo comportamental e dependência da internet e o Instituto Delete-Uso Consciente de Tecnologi@s.

As tecnologias na sociedade contemporânea vem criando novas formas de interação, novos hábitos sociais, enfim novas formas de sociabilidade.Não parece haver dúvida de que nossos comportamentos, nosso modo de ser (como pensamos, percebemos e organizamos o mundo externo e interno, como nos relacionamos com os outros, etc) podem sofrer alterações em função do desenvolvimento da tecnologia.<sup>1</sup>

As relações sociais não ocorrem mais face a face entre os indivíduos e passaram a ser mediadas pelo computador/internet/redes sociais. Podemos considerar que a mediação entre as relações sociais e as tecnologias mencionadas acima podem trazer tanto benefícios como prejuízos dependendo do uso das mesmas no seu cotidiano.<sup>2</sup>

Podemos dizer que os indivíduos com transtornos psiquiátricos, entre eles, transtorno depressivo maior, pânico, ansiedade são propensos a desenvolver dependência da internet na medida em que a mesma é vista por eles como "saída" para lidar com os transtornos<sup>2</sup>. O uso inadequado das tecnologias pode levar o indivíduo a desenvolver uma dependência desses aparatos digitais comprometendo a interação social dos mesmos<sup>2</sup>. A terapia cognitivo comportamental (TCC)<sup>3</sup> pode ser eficaz para o tratamento da dependência das tecnologias na medida em que aborda os prejuízos em diferentes aspectos (psicológico, cognitivo e comportamental) na vida do indivíduo. A TCC<sup>3</sup> possibilita o indivíduo melhorar sua interação social e a usufruir os benefícios das tecnologias.

O Instituto Delete-Uso Consciente de Tecnologi@s é um centro pioneiro no Brasil, fundado pela psicóloga Anna Lucia Spear King e institucionalizado, desde 2013, no Instituto de Psiquiatria(IPUB) da Universidade Federal do Rio de Janeiro(UFRJ). Somos uma equipe composta por profissionais da área da saúde, responsável pelo atendimento médico e psicológico de usuários abusivos e/ ou dependentes de tecnologi@s. Também temos como objetivo orientar a população em geral sobre os benefícios e prejuízos relacionados ao uso abusivo de tecnologias no dia a dia, apresentando conceitos de uso consciente e Etiqueta Digital.O Instituto Delete-Uso consciente de tecnologi@s visa realizar pesquisas científicas.

Com o advento das novas tecnologias<sup>2</sup>, efeitos inesperados começaram a indicar não só os benefícios, como também um uso nocivo fazendo com que os mesmos sejam considerados causadores de danos na qualidade de vida dos indivíduos. Existe uma preocupação dos profissionais de saúde quanto aos prejuízos significativos que tem causado alterações na vida profissional, social e familiar do indivíduo <sup>2</sup>

De acordo com DSM-V<sup>4</sup> os sintomas do transtorno depressivo maior (TDM) são: ansiedade, angústia, apatia, irritabilidade, baixa autoestima, perda da motivação, desânimo, desinteresse, pessimismo, perda ou aumento do apetite, ideia de suicídio. A depressão pode se apresentar em três graus: leve, moderado e grave e a intensidade dos sintomas podem chegar até a ideia de suicídio.<sup>4</sup>

Segundo Young<sup>5</sup> (1998) os sintomas da dependência do computador/Internet e rede sociais, podem ser: Preocupação excessiva com pensamentos acerca de atividade prévia conectada (online), em torno da próxima sessão online. Necessidade de aumentar o tempo conectado para atingir a mesma satisfação, esforços repetitivos, sem sucesso, para parar e/ou reduzir o tempo de uso da internet e presença de agitação, irritabilidade e/ou depressão quando tenta diminuir o tempo de uso da Internet<sup>5</sup>.

O uso inadequado do computador/internet/rede sociais pelos indivíduos pode gerar modificações psíquicas e comportamentais acarretando consequências negativas em diferentes aspectos (psicológico, cognitivo e comportamental)<sup>6,2</sup> da vida do indivíduo.

O estudo de Young<sup>5</sup> sugere que a Terapia Cognitivo-Comportamental (TCC) se utiliza de técnicas eficazes no tratamento do TDM e da dependência da internet (DI). A TCC é uma abordagem terapêutica que promove modificações do comportamento visando o uso consciente da internet, a identificação das distorções cognitivas, entre outras e promovendo as alterações das mesmas<sup>5</sup>.

Alguns dos estudos<sup>7,8</sup> sugerem que o uso por longos períodos da internet pelos indivíduos deprimidos pode comprometer as atividades dos mesmos, assim como também a possibilidade de interagirem socialmente.

As tecnologias nos dias atuais proporcionam aos indivíduos melhoras expressivas na vida cotidiana em diferentes aspectos (social, acadêmico, profissional). Por outro lado os indivíduos podem desenvolver um uso abusivo das tecnologias na medida em que as mesmas tornam-se a saída para lidar com os sintomas (apatia, baixa autoestima, tristeza, desmotivação entre outros) do TDM. Podemos dizer que a relação do indivíduo com as tecnologias podem vir a interferir negativamente na sua qualidade de vida<sup>6</sup>.

Não podemos negar que o acesso às tecnologias pelas crianças e adolescentes<sup>9</sup> cada vez mais precoce mostra que a aprendizagem do uso consciente das mesmas é uma prevenção de transtornos psiquiátricos, tais como depressão, ansiedade, pânico nos dias atuais. Através da prevenção os mesmos podem desenvolver o uso adequado das tecnologias beneficiando-se das mesmas<sup>9</sup>.

Alguns estudos sugerem<sup>10,11,12</sup> que o TDM está relacionado com o uso abusivo das tecnologias. É um recurso utilizado pelos os indivíduos com esse transtorno para enfrentar e compensar algumas deficiências, tais como baixa autoestima assumindo uma personalidade e identidade social desejada pelos os mesmos <sup>10,11,12</sup>.

O estudo de King et al<sup>13</sup>. Sugere que os indivíduos com uso abusivo do computador/Internet/redes sociais apresentaram sintomas crescentes de depressão e que indivíduos dependentes da mesma vivenciam uma maior solidão do que os demais indivíduos<sup>13</sup>.Podemos dizer que não sabemos ainda se os indivíduos com TDM recorrem à Internet para se sentirem inseridos em um contexto social buscando um alívio para os sintomas ou se acabam agravando os mesmos por acreditar que nas redes sociais todos tem uma vida mais bem sucedida do que a sua.<sup>14</sup>

A dissertação é composta de artigos como primeira autora (5) e como coautora de outros (9) que serão descritos a seguir: No primeiro artigo, intitulado "Cognitive behavioral therapy in treatment for smoking alcoholics in outpatiens" observamos que a terapia cognitiva comportamental (TCC) mostrou ser eficaz para o tratamento do tabagismo em pacientes alcoolistas no ambulatório.

O segundo artigo "The complex relationship between depressive disorder and dependency of internet" abordou a associação dos sintomas do TDM com a dependência da internet (DI) mostrando que o TDM foi significativo para intensificar a dependência da internet.

O terceiro artigo "Can depressive disorder contribute to dependence on the internet? Case report" relatou o caso de uma paciente com TDM e DI que ao final do tratamento apresentou uma redução expressiva tanto do TDM quanto o a DI.

O quarto artigo "Validação da escala para avaliar a depressão e a relação com a dependência de tecnologias", teve como objetivo criar um instrumento de avaliação específico que pudesse auxiliar nas futuras pesquisas com esse tema.

O quinto artigo "The relationship of quality of life with major depressive disorder and internet addiction" é a principal pesquisa da Dissertação de Mestrado que teve como objetivo avaliar a relação do TDM com a DI (computador/internet e rede sociais) e o impacto na qualidade de vida dos indivíduos na sociedade contemporânea.

### A Seguir apresentaremos os artigos da Dissertação de Mestrado:

Artigo 1

(Entrada no Mestrado)

Cognitive behavioral therapy treatment for smoking alcoholics in outpatients.

Flávia Melo Campos Leite Guimarães<sup>1</sup>; Antonio Egidio Nardi<sup>2</sup>; Adriana Cardoso<sup>2</sup>; Alexandre Martins Valença<sup>2</sup>; Eduardo Guedes da Conceição<sup>2</sup>; Anna Lucia Spear King.<sup>2</sup>

#### **ORIGINAL RESEARCH**

#### http://www.dx.doi.org/10.5935/MedicalExpress.2014.06.08

# Cognitive behavioral therapy treatment for smoking alcoholics in outpatients

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### ABSTRACT

**OBJECTIVE:** Cognitive Behavioral Therapy is a therapy based on cognitive and behavioral techniques: cognitive psychological education, cognitive restructuring, interoceptive exposure, breathing exercises and relaxation, all aiming at behavioral changes. The objective of the study was to determine the effectiveness of a specific model of Cognitive Behavioral Therapy for alcoholic outpatients treatment of in the smoking. **METHOD:** Sessions were carried out in two stages: (1) a "stop smoking" stage lasting four weeks, with 3 sessions/ week; (2) a maintenance stage beginning with 2 weeks of a single weekly session, followed by monthly until the end of the sessions one-year treatment. **RESULTS:** Forty patients participated in this study, 22 men and 18 women. After a year of treatment, 24 patients had stopped smoking, whereas 16 relapsed during the course of the year; two abandoned treatment. Women showed better results: 77.8% stopped smoking by the end of the treatment, only 45.4% of the reached but men this goal. **CONCLUSION:** Patients under treatment for alcoholism submitted to the tobacco treatment program; a majority of them achieved the treatment goal. A growing population of alcoholics and smokers are looking for treatment; this points to the need for a follow-up treatment program for

smoking in an Alcoholism Treatment Unit. Cognitive Behavioral Therapy proved to be effective in the treatment of tobacco dependency mainly in women.

**Keywords:** Addiction; comorbidity; anxiety; withdrawal.

#### RESUMO

**OBJETIVO:** A terapia cognitivo-comportamental basea-se em técnicas cognitivas е comportamentais: Educação cognitiva psicológica, reestruturação cognitiva, exposição interoceptiva, exercícios de respiração e relaxamento, tudo visando a mudanças de comportamento. O objetivo do estudo foi demonstrar a eficácia de um modelo específico de terapia cognitivo-comportamental para pacientes ambulatoriais alcoólicos no tratamento do tabagismo. **METODO:** As sessões foram realizados em duas etapas; (1) estágio "parar de fumar" com duração de quatro semanas, com 3 sessões/semana; (2) fase de manutenção começando com 2 semanas de uma túnica sessão semanal, seguido por sessões mensais até o final do tratamento de um ano. **RESULTADOS:** Quarenta pacientes participaram deste estudo, 22 homens e 18 mulheres. Após um ano de tratamento, 24 pacientes haviam parado de fumar, enquanto 16 apresentaram recaída durante o decorrer do ano; dois abandonaram o tratamento. As mulheres apresentaram melhores resultados: 77.8% pararam de fumar no final do tratamento, mas apenas 45.4% dos homens atingiram essa meta. **CONCLUSÃO:** A maioria de um grupo de pacientes incluídos num tratamento para o alcoolismo e submetidos ao programa de tratamento do tabaco atingiu o objetivo do tratamento, e abandonou o tabagismo. Uma população crescente de alcoólatras e fumantes está procurando tratamento; isso aponta para a necessidade de um programa de tratamento de acompanhamento para fumar em uma Unidade de Tratamento de Alcoolismo. A terapia comportamental cognitiva mostrou-se eficaz no tratamento da dependência ao tabaco, principalmente em mulheres.

#### INTRODUCTION

In recent years a close association between tobacco and alcohol dependencies has been established, making smoking cessation a challenge, because it is the leading cause of mortality among drug users.<sup>1</sup> It has been shown that alcohol abuse or dependence may increase the possibility of tobacco dependence. Alcoholism has been shown to be a predictor of persistent consumption of tobacco.<sup>2</sup> According to Chaieb et al.<sup>3</sup> there is a predominance of smokers among alcoholics: in a study population of 258 individuals, 129 (50%) were identified as alcoholics, of which 67% were smokers; among the 129 non-alcoholics only 44% smoked, meaning that 74% of non-smokers were non-alcoholic.

Tobacco smoking begins early in life and lasts for a long time, the same being true about tobacco consumption in alcoholic individuals.<sup>3</sup> Heavy smokers are the people with the highest level of alcohol abuse when both are used.<sup>4</sup>

Cognitive Behavioral Therapy has been shown to be effective in the treatment of smoking alcoholic patients.<sup>5</sup> Its use for anti-tobacco treatment is based on the assumptions that (i) cognitive activity influences behavior, (ii) cognitive activity can be monitored and changed, and (iii) the desired behavior can be attained by cognitive change.

According to Kalman et al.,<sup>6</sup> the cognitive-behavioral approach is used in the treatment of smoking by allowing changes in the lifestyle of the individuals, as well as modifications of dysfunctional beliefs and behaviors that relate to the act of smoking. This is an active and pragmatic approach where the alcoholic individual learns to detect smoking relapse situations and develops strategies to cope and to prevent the repeat happenings.<sup>7</sup>

Nicotine reaches the brain in 10 seconds.<sup>8</sup> Systemic actions of nicotine are mediated by Nicotinic Receptors, found in the central and peripheral nervous systems.

Dependence can involve specific psychoactive substances, such as alcohol and tobacco. Both substances are described in the Diagnostic and Statistical Manual of Mental Disorders of the American Psychiatric Association (DSM-IV),<sup>9</sup> where alcohol has the diagnostic label F10 and tobacco, F17. Dependence syndrome is described as a set of behavioral, cognitive and physiological phenomena that develop after repeated use and are typically associated with a powerful desire to consume the drug.

The difficulty of controlling consumption and the persistent use in spite of adverse consequences, as well as the highest priority given to drug use to the detriment of other activities and obligations, leads patients to increased drug tolerance and, ultimately, to a more intense physical withdrawal condition.

The objective of this study is to show that treatment with Cognitive Behavioral Therapy can be an effective resource for the treatment of smoking in individuals with more than one chemical dependency (alcohol and tobacco), leading to the interruption of the smoking habit.

## METHODS

The study was conducted during the period of March 2011 to March 2012 in the Alcoholism Treatment Unit of Municipal Institute Philippe Pinel, in Rio de Janeiro. The Alcoholism Treatment Unit offers hospitalization with 16 male and 4 female beds, an outpatient facility, day hospital and treatment for smoking. Patient-monitored daytime activities at the hospital include a gardening workshop, a library and video workshop, all coordinated by psychologists. It is up to the monitor to explain the work of the workshops and supervise the patients in the execution of task activities.

Patients are initially evaluated and forwarded by the emergency wards of the Municipal Philippe Pinel Municipal Institute for admission or outpatient treatment. The population comes from all regions of the city of Rio de Janeiro and from other cities in the state. Homeless people are included in this population. Patients of both sexes with indication for psychotherapy are forwarded during the admission procedure with the purpose of joining the outpatient treatment.

Patients' families are also assisted through weekly meetings with psychologists.

The sample was randomly collected and consisted of 40 alcoholic patients (22 men and 18 women); they were included from the outpatient clinic for the treatment of smoking. Diagnosis was made by a staff psychiatrist, through the application of the International Neuropsychiatric Interview (MINI),<sup>10</sup> through personal and family history collection, and through the patient's smoking history. The Fargestron test<sup>11</sup> was used to evaluate the degree of physical dependence.

Inclusion criteria for this study were: age between 18 and 75 years old, with a diagnosis of alcoholism (International Statistical Classification of Diseases and Related Health Problems-Psychiatry and Neurology Tenth Revision- ICD-10)<sup>12</sup>and with a regular habit of smoking. Exclusion criteria were the presence of mental retardation and diseases serious enough to prevent the ministration of the follow-up protocol. Participants signed an informed consent in accordance with the code of ethics in research.

The treatment lasted one year, being conducted in 2 stages: Stage 1 "Quit smoking" and Stage 2 "Maintenance" (Relapse prevention). The first stage lasted four weeks (five if necessary), with sessions of Cognitive Behavioral Therapy. During the sessions the theme of smoking treatment with Cognitive Behavioral Therapy was addressed. At the end of each week, a manual was offered to the patient with the sequence of the treatment.

The treatment differs depending on whether the patient is a man or a woman. For women, patients and psychologists carry out treatment jointly. The aims of treatment are to break the social prejudice against alcoholism, to improve quality of life and to rescue the sense of citizenship. The work is performed under a shared management regime (patients and psychologists), where activities (workshops) are jointly agreed upon.

The patients attend the workshops three times a week; on one of the days, a volunteer teaches the techniques of sewing and painting of objects; on the other days the volunteer is replaced by one of the patients who helps the group.

Income is generated through the sale of the products of the workshops and the patients earn a percentage in the manufacture (40%) and sale (40%).

The residual 20% is kept in a group fund. Men perform activities in the day hospital, namely gardening, library and video workshop.

The second stage, maintenance, deals with the prevention of relapse. In this stage it is important to distinguish between a lapse, as opposed to a relapse. A lapse consists of an isolated event of tobacco use while a relapse is the establishment of a new usage pattern or the return to the old pattern. During the first two maintenance weeks, patients attended a single weekly session. After that, patients attended two sessions spaced 15 days apart, then monthly sessions until the end of the one-year treatment.

It is essential that the individual remain tobacco-free to continue the treatment.

Psychotherapy, when required, is accompanied by nicotine supplementation (adhesive and gum) according to the degree of dependence established by the Fargestron test.

#### Instrument

An interview is always conducted, in which we approach the patient history including clinical diseases, existence of familiar smokers, patient relationship with tobacco, existence of psychiatric disorders in the family as well as their motivation for treatment.

We can evaluate motivation according to three moments: (i) **Pre-contemplative,** patient smokes and is not motivated to stop; (ii) **Contemplative,** patient is motivated to stop, but no date of stoppage has been stipulated within the coming days; (iii) **Action,** patient already has a date or is motivated to stop within a month.

#### Intervention

#### Cognitive Behavioral Therapy protocol: the first phase

*First session.* Initial questions: Why do you smoke? How does it affect your health? Points to be made: the harm caused by tobacco, its disease-causing components, such as risk of impotence, stroke, increased coughing, sneezing, chronic bronchitis, emphysema, cancer, coronary artery

disease, peptic ulcer disease, peripheral vascular disease, and loss of taste. Other topics discussed are: ambivalence, consumption of cigarettes, motivations to quit smoking, most difficult obstacles to reach the goal, time of first daily cigarette. It is important that the patient be made aware that the urge to smoke is transitory and be advised that the methods to quit smoking can be abrupt or gradual (Reduction or Postponement). For a Fargestron test above 5 points, the suggested method to stop smoking is the abrupt one, because of a high or very high level of dependence. Below 5 points, the method of quitting may be gradual (Reduction or Postponement).

In the abrupt mode, the patient has to quit smoking on an immediate given date.

In the Reduction mode, the patient must keep an account of smoked cigarettes and reduce this in a daily predetermined way. A date for cessation is established. Patients are advised to bear in mind that a decrease rate by only one cigarette per day is insufficient, unless he already smokes very few cigarettes per day.

In the Postponement mode, the patient delays the time at which he smokes his first daily cigarette by a predetermined number of hours each day. The patient must increase this delay by 2 hours every day; in this modality, reduction of the number of consumed cigarettes becomes irrelevant.

**Second session.** The point to be made here: the first few days without smoking. The topics discussed with the patient are: assertiveness, withdrawal syndrome, reinforcement of the date for quitting. Assertiveness is the patient's capacity to develop his/her ability to express thoughts and feelings and to deal with stressful situations that have to do with smoking.

The patient is checked about the following physical symptoms that can occur during abstinence from tobacco: sweating, headache, dizziness, coughing, drowsiness, increased appetite, insomnia, cramps, tingling in the extremities of the fingers and toes, tension, difficulty concentrating, disturbance in the intestine and stomach. Patient must understand that withdrawal signs and symptoms last from 1 to 3 months, being more pronounced in the first month. Intensity depends on the degree of dependence. The symptoms occur because the body is recovering toward normal metabolism, which was formerly compromised by the cigarettes. Some symptoms are purely psychological such as: anxiety, restlessness, irritability and tension. Because stress and boredom can worsen abstinence, it is important for the patient to identify stressful and boring situations, thus enabling the change from negative to positive thoughts.

During this second session, respiratory and body relaxation practices<sup>13</sup> should be taught.

**Third session.** The main point here is the overcoming of obstacles to remain smoke-free. The topics discussed with the patient are: strengthening decision about the end-date; review of obstacles that have been overcome and those still remaining ahead; valuation of anticipated benefits after stopping. In addition to symptoms, another factor may occur, namely the fear of abstinence which may lead the patient to doubt whether he or she can stop smoking. A point to be addressed is the reward system that makes the patient quit smoking, such as gifts and eating more than usual. If overeating occurs, weight gain may result and referral to nutrition counseling is advised.

**Fourth session.** The main point here relates to the benefits obtained after smoking stops. The topics discussed with the patient are: improvements in quality of life, detection of possible pitfalls to remain smoke-free. Resort to manuals that are given at the end of the sessions, and particularly in moments of rift, call for professionals and other patients.

#### Second-stage Maintenance

The maintenance sessions discuss how the patient is feeling without a cigarette in his or her life, and how he or she is manipulating the resources learnt during the first phase.

The patients must be made aware that smoking is not the answer to their problems no matter how difficult the problems are to cope with. Patients must also be made to understand that their assertiveness and determination will be essential to ensure abstinence.

## Medication

Nicotine replacement therapy is made using adhesive prescribed by the psychiatrist of the team and aims to relieve the symptoms of withdrawal. The medication is given according to the Fargestron test results if they reach high (6 to 7) or very high (8 to 10) values. Below these values there is no indication for the use of the adhesive. In this series, patients used adhesive and gum. The adhesive was administered in three doses (21, 14 or 7 mg applied sequentially), related to cigarette consumption by the patient.

The gum was used in doses of 2 and 4 mg/per unit, according to the consumption of cigarettes, with a maximum of 15 gums a day. Because release of nicotine from gum is slower and absorption is through the buccal mucosa, patients were instructed to keep the gum for 30 minutes distributed between both cheeks. In an emergency situation, the gum can be used as a last resort. This cannot, however, become a substitute for cigarettes. Patients cannot wear an adhesive patch while smoking because a nicotine overload may cause intoxication.

### RESULTS

Table 1 displays demographics for all patients segregated between smokers vs. non-smokers. In all, 24 patients (60%) had positive results for the treatment, i.e. had stopped smoking at the end of one year of therapy. There was a statistically significant difference regarding the sex of those who managed to quit smoking.

Table 1 - De	nographic data	for all p	patients,	segregated	according	to quitting/n	ot quitting	g smoking
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	All the patients (n = 40)	Patients who stopped smoking at the end of the treatment (n = 24 - 60%  of total)	Patients unsuccessful in quitting smoking	Statistical significance
Ano.	Aug : 52 18 + 10 85 um	Aug : 52 82 + 8 94 up	Aug : 52 82 + 8 94 um	Non-clonificant
rate	Min + 24 May 75	Min - 77 May 75	Min: 27 May 75	invir significant.
Sex	22 male	10 male (45.4%)*	12 male	Male vs female:
-	18 female	14 female (77.8%)+	4 female	$x^2 = 4.31; p = 0.03$
Education	Elementary: 13 (33%)	Elementary: 8 (33%)	Elementary: 5 (31%)	Non-significant
100 million (100 million)	Middle: 16 (40%)	Middle: 9 (38%)	Middle: 7 (44%)	
	Higher: 11 (27%)	Higher: 7 (29%)	Higher: 4 (25%)	
Quit smoking during treatment (1 yr)	295	24 (100%)	5	
Relapse during treatment (1 yr)	1655	11 (45%)	5	
Quit at the end of treatment		24 (100%)	0	

\*: percent of males or females who guit smoking

5: includes the 24 who remained non-smokers at the end of treatment

§5: indudes the 11 relapses who recovered and were successful quitters 1: temporary relapses, recovered by the end of treatment; (percentage of relapses among successful quitters)

Five patients stopped smoking but did not retain the result at the end of treatment.

Women showed significantly better results with 77.8% of the women quitting at the end of treatment, vs. only 45.4% of the men.

Other observations which may be useful: (i) five patients stop smoking, but did not keep the result by the end of treatment; (ii) among all the successful quitters, 11 (45.8% of successful) had relapses during treatment.

#### DISCUSSION

The sample studied by Chaieb et al.<sup>3</sup> presented an association between smoking and alcoholism. Alcoholism in their sample was more prevalent in low-income smokers, with low cultural and professional levels.

The association between smoking and alcoholism was also found in our study. A factor that contributes to the occurrence of the use of these drugs is the fact that they are legally obtainable. We can raise the hypothesis that free access to them contributes to their high consumption.

Prochaska et al.<sup>14</sup> claim that interventions for smokina cessation concomitant with the treatment of other addictions increases the period of abstinence. Smokers with a previous history of problems with alcohol are more capable of stopping the use of tobacco than smokers without this history. They attribute this to the fact that these subjects developed skills to solve their problems with alcohol that help to minimize dependence on nicotine and consequently respond to minimum interventions for tobacco cessation.

Peterson et al.<sup>15</sup> note that nicotinic receptors are related to the pathophysiology of various mental disorders and to the mechanisms of action of other psychotropic drugs such as alcohol. From this understanding of the neurobiology of nicotine addiction and usage, it is possible to understand why they are such common mental disorders. Tobacco and alcohol are the two most consumed drugs worldwide, because they are legal and freely sold drugs. However, unlike alcohol, tobacco does not generate socially inconvenient behaviors. In the case of the association of these two drugs, there is evidence that drinking starts before smoking.<sup>15</sup>

According to the Diagnostic and Statistical Manual of Mental Disorders of the American Psychiatric Association (DSM-IV),<sup>9</sup> initiation in the use of alcohol and other drugs increases the risk of co-occurrence of nicotine addiction as also observed in the present study. We have found in this study that there is a great deal of distress in outpatients and that this can be a facilitator for the development of chemical dependency. This can be revealed as some personality traits, for example, emotional regression, immaturity, anxiety, insecurity, inadequacy and weakness of the ego. Tobacco addiction acts as an escape mechanism for people with traces of shyness or fear of taking initiatives, and serves to remove responsibility; all of this is due to low selfesteem and negative self-image.

Fiore<sup>®</sup> states that nicotine replacement therapy results in the occurrence of a reduction of abstinence in patients wanting tobacco cessation; Cognitive Behavioral Therapy alone is an effective alternative for the treatment of smoking.

In the study by Holt et al.,<sup>16</sup> in the sample of 29 alcoholic and 32 smoker patients tobacco relapse also leads to alcohol relapse. In our study, 6 patients relapsed to tobacco, but not to alcohol.

According to Fisher et al.<sup>17</sup> the choice of smoking treatment proposed by the Brazilian National Health Service (Sistema Único de Saúde) is related to the efficacy observed in previous studies that have shown that working with the motivation of the individual leads to good results as regards tobacco cessation.

## CONCLUSION

We conclude that the Fargestrom test for physical dependence was an effective assessment tool. We found that 60% of the sample attained the goal of the study of quitting smoking after 1 year of treatment. Relapse was a part of the treatment for reaching the goal of quitting smoking. The maintenance of the patient's tobacco-free lifestyle is independent of completion of treatment, because this is linked to emotional stability, family and social conditions.

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# Artigo 2

Artigo The complex relationship between depression and Internet addiction.

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The complex relationship between depression and Internet addiction Guimarães FMC<sup>I,II</sup>, Guedes E<sup>I,II</sup>, Pádua MSKL<sup>I,II</sup>, Gonçalves LL<sup>II</sup>, Nardi AE<sup>I,II</sup>, King ALS<sup>I,II</sup>.

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### Abstract

**Introduction**: With the introduction of new technological possibilities (computer, internet, cell phone and social networks) we can observe that a healthy use progressively became abusive in some cases, causing damages in the professional, social and familiar life of the individuals, with consequent behavioral and psychological changes. **Objective**: To systematically review articles on the Major Depressive Episode (MDE) and dependence on the Internet (ID). Individuals with MDE often use the internet as a resource to deal with feelings such as sadness, anxiety, loneliness, making their use abusive and dependent on it. The studies demonstrate an association between MDE and abusive use of the internet. **Methods**: We reviewed the literature using Isi Web of Science, Psycho-info and Pubmed databases

using the terms depression, internet addiction and cognitive-behavioral therapy. **Results**: Studies indicate that there is a relationship between MDE and abusive use of the internet. These individuals have significantly hampered personal, social relationships, academic and professional life. **Conclusion**: Studies suggest that MDE is indicative of internet dependence, as individuals use it as a resource to decrease their negative symptoms.

**Key-Words:** major depressive disorder, Internet addiction, Cognitivebehavioral therapy, technology

## Introduction

The rapid development of new technological possibilities, computer, Internet, cellular telephone and social networks produce significant transformations both positive and negative in the lives of individuals[]. There seems to be no doubt that our behavior, customs and habits may change as a result of the development of these technologies<sup>1</sup>. With the advent of technologies in modernity, we can observe in our daily life that a healthy use has progressively become abusive, causing damages in the personal, social, professional and family life of individuals, leading to behavioral and psychological changes in them<sup>1</sup>.

According to Young<sup>2</sup> the symptoms of computer addiction, Internet and social networks are: excessive preoccupation with thoughts about previous activity connected (online) about the next online session, need to increase connected time to achieve the same satisfaction, repetitive efforts, without success, to stop and / or reduce the time of Internet use and the presence of agitation, irritability and / or depression when trying to reduce the Internet time use<sup>2</sup>.

According to DSM-V<sup>3</sup>, the diagnosis of Major Depressive Episode (MDE) is based on the following symptoms or on the occurrence of at least three of these: depressive mood or irritability, anxiety, distress, discouragement, lack

of motivation, apathy, inability to feel joy and pleasure in activities previously considered pleasant, disinterest, indecision, feelings of fear, helplessness, insecurity, hopelessness, despair and emptiness, pessimism, low selfesteem and loss or increase of appetite.

MDE may have three degrees<sup>3</sup> mild, moderate, and severe. The intensity of the symptoms may determine the time of the symptoms. When they are severe they may lead to the idea of suicide. The peak of onset of depression may occur between adolescence and young adulthood. For some individuals, depression has a relapsing course of recurrence and each time more severe. The inclusion criteria in this study would be the individuals diagnosed by the psychiatrist with MDE and still dependent on technologies according to assessments made by a psychologist from interviews and specific testing applications. Exclusion criteria would be individuals who did not

have the basic level of education, those with some clinical impairment that would prevent them from performing the tests and those without the diagnosis of MDE and ID.

The study by Pantic et al (2012)<sup>4</sup> 4 on social networks and MDE in adolescents found that time spent on Facebook and other platforms is positively related to depressive symptoms. The study by Nikolina Banjanin et al[] conducted with 336 high school students in Belgrade, Serbia shows that internet dependence is positively correlated with depressive symptoms. The study by Blanchnio A et all<sup>6</sup> 6on the associations between internet use, depression and intrusion (access) on Facebook with 672 users shows that depression may be a predictor of excessive use of it. The study of Ella Donnelly and Daria J. Kuss<sup>7</sup> on the use of social networks (SNSs), dependence on SNSs and MDE in 103 young people suggests that MDE is related to their use and dependence on it. The social networks surveyed were: Instagram, Twiter and Snapchat.

The objective is to systematically review articles on MDE and ID. The key question in this search is to describe whether individuals with MDE use
the internet as a resource for dealing with feelings such as sadness, anxiety, loneliness and thus become abusive users.

# Methodology

A review of the literature was done using the Isi Web of Science, Psycho-info and Pubmed databases using the key words: Major Depressive Episode (MDE), Internet addiction (IA), and Cognitive-behavioral therapy (CBT). The key words and their combinations as well as the number of articles are in Table 1. The selected articles referred to CBT as an effective therapy for the treatment of MDE and IA, the relationship between MDE and AI and the use and consequences of internet addiction with MDE. The articles were searched in English. The instruments used by the articles were Halmilton's Depression Test and the Internet Dependency Test. Individuals who participated in the studies had MDE and IA.

# Table 1



## Results

#### Major Depressive Episode (MDE) and Internet Addiction (IA)

A systematic review of studies on Internet Addiction (IA) and psychopathology found in 75% of them a relationship with MDE and in 57% with anxiety<sup>8</sup>.

A study with university students in Turkey suggested that MDE severity and anxiety symptoms were related to high risk of IA<sup>9</sup>

According to the AS Bahrainian et al study on the relationship of selfesteem and MDE with IA in Birjand Islamic Azad University with 408 students (150 male and 258 female), indicated that 40.7% of the students had IA and a significant correlation Between IA self-esteem and MDE<sup>10</sup>.

Griffith<sup>11</sup> in his study suggests that IA is related to MDE. It is a way to address and compensate for some shortcomings such as low self-esteem allowing individuals to assume a different personality and social identity.

Cheung LM, Wong WS<sup>12</sup> conducted a study of 719 adolescents in schools in Hong Kong on the effects of insomnia, IA on MDE. The results show that 17.2% had IA and that more than half had insomnia (51.7%) and MDE (58.9%). The study suggests that both insomnia and IA are significantly associated with MDE.

# Major depressive episode (MDE), Internet addiction (IA) and Cognitivebehavioral therapy (CBT)

The study of Fei He et all<sup>13</sup> with 162 men between the ages of 19 and 23 with Internet Addiction at four universities in Xi, showed that loneliness and social support have negative effects on MDE among men with internet addiction.

The study of Brand et all<sup>14</sup> in a population of 1019 Internet users in general, shows that 63.5% have symptoms of IA and individuals with MDE, anxiety, low self-esteem, low self-efficacy and provides evidence that cognitive behavioral therapy (CBT) is effective in the treatment of IA by treating and identifying the individual's cognitions (style of expectation and use of the internet) that measure the impact of social cognition (loneliness, social support) on IA symptoms, personality triats and psychopathological symptoms.

The results of studies suggest that CBT should address maladaptive cognitions with the dysfunctional use of the internet. These results showed that these cognitions, such as, self-negative concepts are associated with the dependence of the internet (IA) Young 2007)<sup>15</sup>. CBT uses the cognitive restructuring of negative thinking.

Wölfling K et all<sup>16</sup> conducted a pilot study on the effects of a standardized cognitive-behavioral therapy program with 42 men with IA criteria. Their IA status, psychopathological symptoms and expectation of perceived self-efficacy were assessed before and after treatment . The results show that 70.3% of patients finished therapy regularly. The of IA decreased significantly after symptoms treatment. Both psychopathological symptoms and associated psychosocial problems had a reduction. The results emphasize the conclusions of the meta-analysis performed.

The recent meta-analytical study by Mücken et all<sup>17</sup> including 16 clinical trials with different therapeutic approaches with 670 patients indicates high efficacy of IA treatment. The results depending on the type of therapeutic treatment with cognitive-behavioral programs, suggest significant differences, exhibiting greater effect on symptoms of IA decrease than other psychotherapeutic approaches. However, overall results indicate that each treatment approach analyzed had significant effects.

According to the suggestions of the study of Young<sup>18</sup> with 128 individuals with IA the CBT has an effective treatment in the treatment of technology dependence. CBT is an approach encompassing behavioral

modification IAmed at the conscious use of the internet, the identification of cognitive distortions by promoting their modifications and the treatment of disorders.

## Use and consequences of technologies with MDE (UCT with MDE)

Some authors<sup>19 20</sup> agree that IA may be a serious public health concern that can have detrimental effects on general and psychological well-being.

In modernity we can observe that the use of the internet in general, as well as certain specific online activities such as social networks by depressed individuals can be associated with feelings of loneliness, low self-esteem, enabling them to become abusive users of technologies<sup>1</sup>. Individuals use technology in an abusive way as a strategy for the reduction of negative feelings seeking a relief for themselves<sup>21</sup>.

Over the past 10 years, with the creation and popularity of social networking, significant changes have been introduced in how people communicate and interact in an online environment. Social networking sites today have more than 1 billion active users and this number can increase even more in the future<sup>22</sup>.

The use of the Internet for prolonged periods by depressed individuals hampers their activities, as well as the possibility of interacting socially. Individuals' relationships become virtual, rather than real-life<sup>1</sup>. The study of Fortson BL et al <sup>23</sup> of 411 graduate students at West Virginia University, USA found that 90 percent of participants had daily internet use, approximately half of the sample met criteria for internet abuse and a quarter of the sample had IA.

The MDE was correlated with daily internet use to meet people, experiment and participate in chat rooms and with less face-to-face socialization. In addition, individuals with IA had more depressive symptoms, more online time and less face-to-face socialization than those who did not<sup>20</sup>.

#### Discussion

According to Valença (2014)<sup>1</sup> the association between Nomophobia and depression can happen in two ways: in the first way the depressed individual with symptoms such as sadness, lack of pleasure for activities, feeling of discouragement, difficulty of concentration and social isolation, tends to resort to the internet use as an attempt to lessen their isolation. In the second way of association, Nomofobia would arise first where individuals would use the internet pleasantly, with progression of this use to a pattern of dependence.

Catriola Morrison and Gore H<sup>24</sup> suggest that there is a strong link between IA and MDE. According to the survey, among the 1,319 respondents that made abusive use of the In ternet, to the detriment of aspects of their lives. The group of Internet-dependent individuals was five times more depressed than individuals who were not classified as dependent. The survey indicated that abusive use of the Internet is associated with MDE, but what we do not know is what comes first, whether depressed individuals are attracted to the Internet or whether the Internet causes MDE.

According to Chou and Edge<sup>25</sup> (2012) the internet for individuals with MDE can aggravate it by having the impression that others are happier and more successful than them.

Individuals with low self-esteem, low motivation use the internet as a resource to decrease symptoms, making their use abusive. The Internet is a type of security tool for them<sup>26</sup>.

The study by Ömer Senormania et al <sup>27</sup> with 720 university students from the Bülent Ecevit University Preparatory School suggests that MDE was

significantly higher in the internet dependent group than in the nondependent group. Excessive use of the Internet causes loneliness and social isolation that can trigger MDE in individuals.

Researchers believe that MDE can occur due to adolescents' dependence on the Internet, resulting in their relationships to the virtual world, which hampers their relationships in the real world. Indeed, they lack communication and real social support, which increases their susceptibility to MDE.<sup>28,29</sup>

Fei He, et al.<sup>30</sup> in their study address the effect of loneliness and social support in MDE among Internet addicts. The sample consisted of 990 individuals, of whom 162 were Internet-dependent individuals aged 19-23 years. Loneliness and social support are significantly correlated with MDE among Internet addicts. Loneliness plays a mediating role between social support and MDE.

Recent studies have shown that internet addiction was positively related to a decrease in social interactions, depression, loneliness, and low selfesteem<sup>31 32</sup>

Akin A and Iskender M<sup>33</sup> in their study with depressed individuals have shown that they are more likely to have Internet addiction. They suggest that if individuals can reduce their dependence on the Internet, they can reduce their level of depression.

The results of the studies indicated that the Internet has an expressive meaning in MDE as individuals use it in an attempt to reduce depression and may trigger addiction.

Some of the studies suggest that IA shows some symptoms of MDE, and for individuals who are prone to depression, it may aggravate them.

## Conclusion

According to the studies analyzed there is a relationship between MDE and IA. Depressed individuals often resort to the internet as a resource to reduce the symptoms of MDE seeking relief for them.

Individuals with MDE have difficulty interacting socially, starting to relate to each other in a virtual way. The low self-esteem contributes significantly to the online relationship allowing the individual to ward off encounters in real life. With this, the anonymity of the individual is maintained by avoiding disapproval and the judgment of the other.

However, it is not known whether individuals become depressed due to abusive use of the Internet or if they become dependent due to MDE.

More studies are needed to more accurately verify the interrelationship of emotional issues with IA.

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# Artigo 3

Relato de caso - Can depressive disorder contribute to dependence on the internet? Case report.

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Can depressive disorder contribute to dependence on the internet? Case report.

# Guimarães FMCL<sup>1</sup>, King ALS<sup>2</sup>, Nardi AE<sup>3</sup>

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# Abstract

Technologies (computer / internet and cell phone) entered the lives of individuals in the early 1990s. Thereafter there was a significant change in all aspects of the lives of subjects due to the presence of these devices in everyday life.

We consider it important to emphasize that the "Normal" use of technologies is for leisure and / or work and "pathological" use is related to some mental disorder. The abusive and daily use does not mean the pathological dependence (PD). The pathological dependence must always be related to an ingrained disorder. We report the case of a patient with major depressive disorder (MDD) who developed a PD with the technologies (relational sites, whatsapp) to alleviate the symptoms of depression, such as sadness, discouragement, demotivation, isolation. Technology for the patient was the resource for making contact with people.

The treatment consisted in the use of medications and sessions of Cognitive-Behavioral Therapy. We verified the reduction of symptoms and consequently of the dependence on the technologies.

We conclude that MDD in some cases may contribute to PD in patients with this disorder until they receive appropriate treatment for it.

**Keywords**: major depressive disorder, internet addiction, cognitive behavioral therapy.

## Introduction

Technologies (computer / internet and cell phone)<sup>1</sup> entered the lives of individuals in the early 1990s. Thereafter there was a significant change in all aspects of the lives of subjects due to the presence of these devices in everyday life<sup>1</sup>. As a result of this daily coexistence, we began to observe not only the benefits brought by the above mentioned technologies, but also undue behaviors related to abusive use of them. We consider important to emphasize that the "Normal"<sup>1</sup> use of the technologies is that for leisure and / or work and the "pathological" use<sup>1</sup> is related to some mental disorder<sup>2</sup>. The abusive and daily use does not mean pathological dependence. The pathological dependence must always be related to an ingrained disorder<sup>1</sup>.

According to DSM-5<sup>2</sup> description, the diagnosis of Major Depressive Disorder (MDD) is based on the following symptoms or on the occurrence of at least three symptoms: depressive mood or irritability, anxiety, distress, discouragement, lack of motivation, apathy, inability to feel joy and pleasure in activities previously considered pleasant, disinterest, indecision, feelings of fear, helplessness, insecurity, despair and emptiness, low self-esteem, loss or increased appetite.

TDM can have three degrees: mild, moderate, and severe. The intensity of the symptoms may determine the time of the symptoms. When the symptoms are severe they may lead to suicide. The peak of onset of depression may occur between adolescence and young adulthood.

We report the case of a patient with MDD who developed a relationship of pathological dependence with the technologies in order to alleviate and reduce the symptoms. The patient quit working, she recently separated from her husband and was feeling unmotivated with low self-esteem. The patient began to relate to men who lived in other city through the website, because she felt very insecure.

The pathological dependence<sup>1</sup> on technologies has emerged as an attempt to reduce the symptoms of depression. The patient experienced anxiety, anguish, apathy, sadness, among other symptoms, characteristic of depressive disorder. She found in technology a psychological resource to deal with the symptoms in the face of everyday situations. She came to regard technology as a necessary psychological support in an attempt to rescue his self-esteem. The patient had been treated for depression five years earlier.

The patient was referred for medical and psychological evaluation in the Grupo Delete-Uso consciente de tecnologias<sup>3</sup> (Care center for dependents of technologies) at the Universidade Federal do Rio de Janeiro and her treatment consisted in the use of medications and sessions of Cognitive-Behavioral Therapy (CCT)<sup>1</sup>.

The objective was to verify if the depression could be contributing to the dependence of technology in a patient with depressive disorder.

#### **Material and Methods**

Woman, 50 years old, Brazilian, divorced, with two children, college education, diagnosed with major depressive disorder and symptoms of anguish, anxiety, sadness, apathy, loss of interest, easy crying. Currently she has been out of work. The depressive disorder started five years ago and she had treatment at the time. The symptoms returned after the separation from her husband, which occurred one year ago. The patient developed a dependence on technology with the aim of alleviating and reducing the symptoms.

The medical prescription consisted of the use of fluoxetine. The patient had eight sessions of cognitive-behavioral therapy (CBT), which included specific techniques<sup>4</sup> such as: psychoeducation and cognitive restructuring. The purpose of the sessions was to inform the patient about the depressive disorder, to give new meaning to her thoughts, to recover the self-esteem and to lead to a conscious use of technology, separating it from the role of "medication".

The instruments used<sup>6</sup> by the psychologist were: MINI<sup>5</sup>, internet dependence test (IAT)<sup>6</sup>, Hamilton Anxiety scale (HAM-A)<sup>7</sup>, Hamilton Depression scale (HAM-D)<sup>8</sup>, Global Clinical Impression (GCI-S<sup>9</sup>) and brief Version-Quality of life (WHOQOL) The instruments at the beginning of treatment showed the following results: IAT: 60, HAM-A: 40, HAM-D: 15 and WHOQOL: 44.

During the course of the treatment the patient presented improvements, such as return of motivation, of the interest in work, recovery of joy and selfesteem. The patient feels more secure about relating to men and she begins a love relationship during treatment. There was a reduction of the symptoms of the picture and consequently the dependence of the technology had a significant decrease, being considered a normal use.

A follow-up was made after the twelve CBT sessions when the scales were reapplied after medical and psychological treatment. The follow-up results were: IAT: 5, HAM-A: 2, HAM-D: 2, CGI-S: 1, and WHOQOL: 78. We verified that the patient reduced symptoms, returned to work and became better acquainted with people, attending social events and constituted an affective relationship. She is dealing with less anxiety, she feels more secure in day to day situations: Regarding medication, she maintains the use of fluoxetine.

## Results

The patient is feeling more secure and more able to cope with problems and improved her self-esteem. She can set future goals, among them return to work. As we can observe the technology is no longer the possibility of contact with the outside world. She no longer needs this resource to be able to interact with everyday situations.

The use of technology by the patient is now for leisure (listening to music and going to the theater and movies with friends). As for work, she has become interested in refresher courses related to her professional activity. The patient no more relates to people through technology now. She relates to them in the real world.

## Discussion

TDM<sup>2</sup> has as one of the criteria low self-esteem, loss of interest, anxiety, apathy. As a result, the individual may develop a dependence on the Internet<sup>11</sup>, seeking in the Internet a relief to the discomfort generated by the

symptoms and consequently a reduction of these symptoms, as was the case of the patient in question.

-We observed that the patient used the technology as a tool to deal with her MDM. The technology dependence began to affect her behavior, as the more intense the symptoms, the more expressive became the pathological Internet dependence.

-Stravogiannis & Nabuco de Abreu<sup>12</sup> in their case report suggested an association of Internet addiction with psychiatric disorders. Individuals with comorbidities are more predisposed to abusive use of the Internet. We have seen in the present case the MDM related to the development of pathological dependence of the internet.

-Schwartz et al.<sup>13</sup> in their article on excessive use of the Internet for games by adolescents says that it can compromise academic performance, social interaction and sleep. The abusive use of any technology can compromise various aspects of the life of individuals as we have seen in the present case.

-Young et all<sup>14</sup> in their study on individuals with abusive use of technologies also observed a significant commitment in their lives, with respect to professional activities and affective relations. The pathological dependence of the Internet in this case also presented damages in personal and family life.

Some authors<sup>15, 16</sup> have demonstrated that technology-dependent patients may experience withdrawal symptoms similar to those of drug-dependent patients. Some nomophobic symptoms<sup>17</sup> were observed in the patient being studied.

-Studies show<sup>18,19</sup> a significant correlation between the abusive use of technologies and negative emotions, among them, anxiety, depression. At the end of treatment the patient's relationship with the technologies ceased to be a vehicle for communication with the outside world.

-Behavioral cognitive therapy<sup>20</sup> and pharmacological treatment have made possible changes such as reduction of symptoms, learning how to deal with physical symptoms, orientation to the conscious use of technologies, among others. We were able to observe increased self-esteem and return to work.

-Given the complexity of the subject and as a limit to this study, we consider that important studies must be conducted with a greater number of individuals so that we can obtain more significant data that can portray the possibility of relation or no relation of mental disorders with the pathological dependence of technologies.

## Conclusion

In some cases, MDD may contribute to the pathological dependence of the technologies in patients with this diagnosis insofar as the technologies are used by them as a resource to reduce or ameliorate the symptoms of depression.

In modern society the abusive use of technologies has increased significantly in the daily life of individuals. We are seeing in the current scientific literature the publication of several cases of pathological dependence on technologies related to psychiatric disorders.

We consider it important to report cases like this so that we can contribute to the improvement of the treatment of this new demand from patients that are the dependents of technologies. We have seen in this case that the use of medication and CBT sessions significantly reduced MDD and consequently the pathological dependence of technologies.

The use of technologies in everyday life should receive specific guidance from experts so that it does not become abusive and thus compromise the quality of life of individuals.

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# Artigo 4

Validation of the scale for assessing depression and its relation to technology dependence. (EDDT).

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(Submit Medical Express)

**TITLE:** Validation of the scale for assessing depression and its relation to technology dependence.

**RUNNING TITLE:** Validation of depression scale and its dependence on technologies.

Flavio Leite Guimarães<sup>I</sup>; Mariana King Padua<sup>I</sup>; Eduardo Guedes<sup>I</sup>; Lucio Lage Gonçalves<sup>I</sup>; Hugo Kegler dos Santos<sup>II</sup>; Douglas Rodrigues<sup>II</sup>; Antonio Egidio Nardi<sup>I</sup>; Anna Lucia Spear King<sup>I</sup>.

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#### ABSTRACT

**BACKGROUND**: The daily coexistence with the technologies (computer, mobile phone, tablet, among others), begins to produce significant changes in human behavior. We have observed that there is an association between dependence on technologies and major depressive disorder, as well as with other mental disorders.

**OBJECTIVE**: To validate a scale for assessing depression and its relation to dependence on everyday technologies.

**METHODS**: Validation of a Technology Dependent Depression Scale (TDDS) was performed in 5 phases: (1) initial scale construction with 20 questions; (2) expert evaluation; (3) application to 100 volunteers, (4) statistical analysis and results, (5) preparation of the final version of the validated TDDS.

**RESULTS**: We used the REdaS statistical program and the "dplyr" package to present descriptive statistics, hypotheses tests of mean differences and factorial analysis. The results provided a validated and approved final version for TDDS.

**CONCLUSIONS**: We constructed the final version of the validated TDDS, which is adequate for clinical contexts and to be used in future research. All the psychometric properties were checked for accuracy, reliability, presentation,

clarity, pertinence and comprehension of the instrument conferring validity to the end-product.

**KEYWORDS**: Digital dependence; major depressive disorder; depression; social networks; technologies.

#### INTRODUCTION

Computers, mobile phones, tablets, among other technologies (CMT&O) are modifying the interactions of individuals with the world and creating a new social dynamic scenario.<sup>1</sup> We live in the digital age where the proper use of technologies can bring benefits to the individual in several segments of life.<sup>1</sup> Unfortunately, abuse use of technologies, can lead to dependence,<sup>2</sup> often associated with mental disorders,<sup>3</sup> such as major depressive disorder (major depression), among others.

Digital dependence<sup>2</sup> is the lack of complete autonomy or lack of independence to perform tasks without the use of digital communication devices such as the Internet, cell phone, tablet, social networks, etc.

According to the Diagnostic and Statistical Manual of Mental Disorders (DSM - IV),<sup>3</sup> Major Depression or Unipolar Depression is a psychiatric disease capable of causing numerous physical and psychological symptoms. The most common symptoms are profound sadness, irritability, anguish, tiredness, loss of pleasure, apathy, lack of motivation, low self-esteem, loss or increase of appetite, suicidal thoughts that may be present in mild, moderate and severe degrees.<sup>3</sup>

Depressed Individuals may have difficulty in establishing and maintaining relationships in the real world due to feelings such as insecurity, shyness and low self-esteem;<sup>4</sup> so they tend to confine themselves to virtual contacts.

Professionally, we come across individuals with major depression who seek to make contacts through the Internet in order not to feel lonely and also to feel inserted in some kind of context.<sup>5</sup> However, because of low self-esteem and because they do not feel accepted and valued, they often create a false profile of themselves in the social networks.

According to Guedes et al,<sup>6</sup> the use of Facebook becomes excessive insofar as social networks become a resource for the individual to avoid contact with uncomfortable feelings, such as loneliness, stress, anxiety and depression.

The association between technology dependence<sup>7</sup> and technology dependent depression can develop in two ways. Some people with major depression (various symptoms present) can resort to the internet and social networks in an attempt to reduce these symptoms, mainly of solitude and social isolation. For others, technology dependence comes first: these people would already be heavy (daily, for many hours) technology users and become depressed because they "believe" that the lives of others they "meet" in social networks is much better than theirs. There are usually people who believe in everything they see posted.

The purpose of this study is to create and validate a scale for assessing depression and it's relationship with technology dependence (TDDS) and to better identify individuals with major depression, to provide specific treatment, guidelines for the conscious use of technologies, as well as to aim at a reduction of symptoms and dependence.

#### MATERIALS AND METHOD

TDDS validation was performed in 5 phases: (1) initial scale construction with 20 questions, (2) expert assessment, (3) scale application to 100 volunteers, divided into a Main group (50 participants with major depression and abusive use of technology), and a Control group (50 participants without major depression), (4) statistical analysis and results, and (5) preparation of the final validated version.

For a scale to be validated it must develop its content in strict alignment with the subject and the research objectives. Six trained specialists in the area of digital dependence constructed an initial scale with 20 questions and submitted them to an evaluation performed by six other experts. These analyzed the content for presentation, clarity, relevance and comprehension, thus providing an initial, provisional validity.

There is no consensus to define the number of specialists who should participate in the validation of a scale; therefore, this definition is at the judgment and accessibility of the researcher. However, the greater the number of specialists, the greater the disagreement, and the smaller this number (e.g. less than 3) the greater the risk of agreement being one hundred percent.

The initial version of TDDS (20 questions) was applied, as noted, to volunteers; they were asked to insert the following values next to each question: Never/Rarely (0 points); Often (1 point), Always (2 points). Marked values for each question should be added and the following results should be considered: 0 - 10 points: without disturbances; 11 - 20 points: low risk; 21 - 30 points: moderate risk; 31 - 40 points: severe risk of depression and technology dependence.

Demographic data, namely (a) age group; (b) gender; (c) Professional moment; (c) degree of education were only used for identification purposes, not for scale validation

**Sample, Inclusion and Exclusion Criteria.** The volunteers participating in the validation of the TDDS were patients who sought our facility with a complaint of abuse of technologies, some with major depression or other associated disorders. Inclusion was extended to students, employees, persons accompanying the patients and any who agreed to participate. Volunteers were randomly recruited through posters at the institution, verbal communication from person to person and on social networks. Participants should be aged of 16 - 65 years.

The initial TDDS (20 questions) was applied to 100 individuals divided into two groups: (a) Main group (50 participants, major depression and abusive use of technologies); (b) Control group (50 participants, no depression or abusive use of technologies).

**Inclusion Criteria**. In order to be included in the Main Group, participants should have scored 50 or higher on the Internet Addiction Test (IAT),<sup>8</sup> and to have been diagnosed with major depression, by the team psychiatrist. The Control Group included volunteers with a score lower than 50 on the IAT scale,<sup>8</sup> (no abusive use) and no associated mental disorders according to psychiatric evaluation .

Exclusion criteria. Illiteracy or serious mental or clinical impairment.

At the end of the data collection, we inserted the results into a database to perform statistical analyzes.

#### RESULTS

Data analysis used dplyr,<sup>9</sup> psy,<sup>10</sup> paran<sup>11</sup> and REdaS12 programs. The results of the descriptive statistics and of the test of hypotheses (differences of means and factor analysis) are presented below. All entries are divided into Main and Control Groups.

1) Descriptive Statistics: Table 1 shows the results of the descriptive statistics of the sample. For each characteristic we present the absolute number and the corresponding percentage.

Sex						
	Male	Female				
Control	8 (16%)	42 (84%)				

Table 1 - Sample Descriptive Statistics

Main	17	17 (34.7%)					32 (63.8%)						
Age ranges													
		15-25 26-36 3		37 47 48-5		58	59	9-69					
Control		14 (28%)		6 (12%)		10	(2	20%	5)	7 (1	4%)	13	3 (26%)
Main		11 (22.4%	)	17 (34.7%)		16 (32.7%)		7%)	4 (8.2%)		1	(2%)	
Edicational	leve	el		I		1							
	Mi	iddle	higl	ner	Gradı	uate	e	e IV	laster		Doctoral		NI
Control	16	(32%)	16 (	32%) 12 (2		2 (24%) 2 (4%		(4%)		3 (6%)		1 (2%)	
Main	23	(46.9%)	19 (	38.8%)	5 (10.	2%)		2	(4.1%)		0 (0%)		0 (0%)

Average scores for the original 20-question questionnaire. The Control Group scored 3.7±4.7 points; the main group scored 19.0±6.5 points; the corresponding t-statistic was 13.42 bringing up p<0.001. This highly significant difference between groups ratified the questionnaire, separating serious dependence and depression in Main Group from no-dependence/depression in the controls.

**Factor analysis.** The first test performed was the Bartlett sphericity test to verify if the variables are correlated with each other. In this test, the null hypothesis is that the correlation matrix is equal to the identity matrix. For the data set, a statistic equal to 1360.107 corresponded to p<0.001, indicating that the covariance matrix was very significantly different from the identity matrix.

The Kaiser-Meyer-Olkin (KMO) criterion was used to determine the adequacy of the factor analysis. A value equal to 0.868 was found, higher than 0.8, which is considered appropriate.<sup>13</sup> Table 2 presents the Measure Sampling Adequacy (MAS) indices for each of the 20 variables (questions).

Table 2 - Measure Sampling Adequacy (MAS) of Questions

TDDS.1	TDDS.2	TDDS.3	TDDS.4	TDDS.5
0.882	0.868	0.926	0.905	0.903
TDDS.6	TDDS.7	TDDS.8	TDDS.9	TDDS.10
0.938	0.819	0.871	0.590	0.632
TDDS.11	TDDS.12	TDDS.13	TDDS.14	TDDS.15
0.910	0.781	0.859	0.706	0.869
TDDS.16	TDDS.17	TDDS.18	TDDS.19	TDDS.20
0.900	0.535	0.920	0.935	0.895

Due to the results found for both the Bartlett test and the KMO, we decide that it was appropriate to carry out the factorial analysis for the scale.

To check the factorial loads in order to determine the number of relevant factors, we used 3 criteria: Factorial Load, Screeplot and Parallel Analysis. Table 3 shows the Factorial Loads:

Table 3 - Factorial loads of the main components.

	PC1	PC2	PC3	PC4	PC5
Standard deviation	3.006	1.423	1.190	1.050	0.992
Proportion of Variance	0.452	0.101	0.071	0.055	0.049
Cummulative proportion	0.452	0.553	0.624	0.679	0.728
	PC6	PC7	PC8	PC9	PC10
Standard deviation	0.945	0.861	0.792	0.715	0.667
Proportion of Variance	0.045	0.037	0.031	0.026	0.022
Cumulative proportion	0.773	0.810	0.841	0.867	0.889
	PC11	PC12	PC13	PC14	PC15

Standard deviation	0.634	<u>0.572</u>	<u>0.534</u>	<u>0.506</u>	<u>0.478</u>
Proportion of Variance	<u>0.020</u>	<u>0.016</u>	<u>0.014</u>	<u>0.013</u>	<u>0.011</u>
Cumulative proportion	0.909	0.926	0.940	0.953	0.964
	PC16	PC17	PC18	PC19	PC20
Standard deviation	<u>0.451</u>	<u>0.409</u>	<u>0.370</u>	<u>0.342</u>	<u>0.307</u>
Proportion of Variance	0.010	0.008	0.007	0.006	0.005
Cumulative proportion	0.974	0.983	0.989	0.995	1.000

It is recommended<sup>13</sup> to use factor loads with cumulative values above 0.9. However, for the data set, we would have to discard 11 factors, which in practice would not solve the problem of data reduction. We then proceed to the Screeplot criterion of the correlation matrix, where we eliminate the factors related to Eigenvalues greater than 1, as shown in Figure 1:

Figure 1. Screeplot chart.

# [FIGURE 1 HERE]

Figure 1 shows components above the red line with variances greater than 1; these are the relevant components.

By this criterion, we may use 4 factors, and in this case, the commonalities of the variables are presented in table 4

TDDS.1	TDDS.2	TDDS.3	TDDS.4	TDDS.5
0.682	0.861	0.786	0.823	0.863
TDDS.6	TDDS.7	TDDS.8	TDDS.9	TDDS.10
0.743	0.594	0.668	0.763	0.708

Table 4 -	Communa	lity for	4 Factors
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TDDS.11	TDDS.12	TDDS.13	TDDS.14	TDDS.15
0.741	0.685	0.639	0.478	0.480
TDDS.16	TDDS.17	TDDS.18	TDDS.19	TDDS.20
0.694	0.377	0.744	0.657	0.594

Analyzing these commonalities, 3 questions should be excluded because they present commonalities less than 0.5, namely questions 14, 15 and 17.

The third criterion used to find the number of factors was the Parallel Analysis where the number of factors found was equal to 2. The table with the commonalities for two factors is presented in Table 5.

TDDS.1	TDDS.2	TDDS.3	TDDS.4	TDDS.5
0.547	0.637	0.704	0.745	0.758
TDDS.6	TDDS.7	TDDS.8	TDDS.9	TDDS.10
0.613	0.352	0.413	0.722	0.634
TDDS.11	TDDS.12	TDDS.13	TDDS.14	TDDS.15
0.653	0.487	0.560	0.204	0.401
TDDS.16	TDDS.17	TDDS.18	TDDS.19	TDDS.20
0.678	0.139	0.677	0.605	0.533

Table 5 - Communality with 2 Factors

With two factors, questions 7, 8, 12, 14, 15, and 17 should be eliminated because they present commonalities below 0.5. Moreover, most of the questions are left with very little of the variance explained by these factors. We therefore opted to use the results with the four factors obtained through the Screeplot Criterion.

The last step was the calculation of Cronbach's Alpha Index,<sup>13</sup> in order to measure the internal consistency of the questionnaire. The value found was 0.932, which is considered excellent.<sup>13</sup>

#### DISCUSSION

For the elaboration of a final validated scale that definitively meets the proposed objective (evaluation of depression and its relation with dependence of technologies), it would be necessary that all the stages be fulfilled and that the final adjustments be made after expert and statistical analysis. Taken jointly, the complete analysis detected three questions that were considered irrelevant and which were deleted from the final version.

In a discussion of the results, starting with the results of the volunteer tests, we a highly significant difference between the means of the Principal and Control groups, which ratifies the questionnaire's adequate separation between the individuals with/without digital dependence/depression. Although not a research objective, we also recorded demographic distributions in terms of gender, age brackets and degrees of instruction, confirming the randomness of the two samples. Simply as an example, a skewed distribution across the age ranges, would have introduced a probable age-related bias.

As a pre-requisite to perform the factorial analysis, Bartlett's sphericity tests and the KMO confirmed the suitability of the factorial analysis, using three criteria; the Screeplot was the most valid, indicating the withdrawal of three items from the questionnaire. Thus the questionnaire was reduced to 17 questions. The three removed questions dealt with:

14. How often do you usually resort to computers, mobile phones tablets, etc. (CMT&O) to search for diseases or medication?

15. How often do you usually seek CMT&O for affective/sexual relationships or to have someone to talk to?

17. How often do you usually stop taking care of your hygiene, to have more time for CMT&O? This last issue was considered important in other studies,<sup>14,15,16</sup> which found an serious lack of hygiene in young people with depression and dependence on technologies.

In addition, the Cronbach Alpha Index<sup>13</sup> with the excellent result of 0.932 revealed the high internal consistency of this scale, reinforcing its validity within our defined objective.

The main limitation of the study was the lack of other validated specific instruments that assessed depression in relation to technology dependence. The presence of such previously reported instruments might have been useful in developing this scale

We believe that future studies on the subject may improve upon the design of instruments. The subject is very little explored and, therefore, contributions are always welcome.

#### CONCLUSION

We obtained the final validated 17-question version of the TDDS, adequate to clinical contexts and to be used in future research on the topic. All psychometric properties were checked for accuracy, reliability, presentation, clarity, relevance and comprehension of the instrument, conferring validity to the end-product.

All 17 questions of the final version of TDDS presented alignment with each other, qualifying the scale as a positive and pioneer instrument to evaluate the depression/technology dependence relation. This could meet the demand for future research that would require a specific instrument, such as this.

#### AUTHOR CONTRIBUTION:

F L Guimarães - reviewed the literature, applied the scales, worked in the database and wrote the present article.

M K Padua - applied the scales and wrote this article.

E Guedes - applied the scales and wrote this article.

L L Gonçalves - wrote this article.

H K Santos - analyzed statistically and wrote this article.

D Rodrigues - analyzed statistically and wrote this article.

A E Nardi - wrote this article.

A L S King - oriented, planned, reviewed the literature, applied the scales, worked the database, wrote this article.

#### CONFLICT OF INTEREST

All authors declare no conflict of interest.

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## ANNEX 1 – Final validates scale

Scale to evaluate depression and its relation with the dependence of technologies (computer, mobile phone, tablet, & others) in daily life (TDDS).

Date: \_\_\_\_ / \_\_\_\_ / \_\_\_\_ Age: \_\_\_\_\_ NAME OF VOLUNTEER:

Gender: F ( ) M ( ) Works: Yes ( ) No ( ) Unemployed: Yes ( ) No ( ) Level of Education: ( ) Middle ( ) High () Graduate ( ) Master ( ) Doctoral Signature of Volunteer:

Email:\_\_\_\_\_

Tels\_\_\_\_\_

INTERVIEWER:\_\_\_\_\_

This test is a scale with 17 questions that measure mild, moderate, and severe levels of depression and its relationship with dependence on technologies.

Please note: The acronym CMT&O stands for "Computer, mobile phone, tablet, among other technologies".

Please enter the number corresponding to each answer next to the question: a- Never/Rarely (0)

- b- Frequently (1)
- c- Always (2)

## Questions

1-How often do you usually feel very sad or depressed?

2-How often do you usually feel discouraged?

3-How often do you usually feel nervous or anxious?

4-How often do you usually feel devalued or unimportant?

5-How often do you usually feel loss of interest in everyday activities?

6-How often do you look for some CMT&O technology so you do not feel lonely or try to make friends?

7-How often do you usually cut your sleep short to stay with CTCTO?

8-How often do you usually feel like dying?

9-How often do you usually think about taking your life?

10-How often do you usually get CMT&O to rule out the idea of suicide or to research the subject?

11-How often do you use CMT&O to reduce your pessimistic or negative feelings or feelings?

12-How often do you seek to make more friends in CMT&O than in real life?

13-How often do you usually get CMT&O to feel included in some social context?

14-How often do you usually get the CMT&O to search for curiosities, new subjects, to read newspapers or magazines?

15-How often do you usually get CMT&O to change your mood from negative to positive?

16-How often do you usually stop practicing some physical activity or doing outdoor programs to stay at the CTCTO?

17-How often do you usually get CMT&O to find some leisure activity or company?

## Results:

Once you have answered all the questions, add up the numbers you selected for each answer to get a final score. The higher the score, the higher the level of CMT&O dependence that may be related to depression.

Below are the points values obtained in your score:

Up to 4 points: You are a user with no signs of abuse of the CMT&O related to depression and with full control over its use.

05 - 14 points: Mild - You show signs of possible abuse of CMT&O related to mild depression. You begin to have occasional problems due to the onset of

abusive use of CMT&O related to depression in certain situations. This may have an impact on your personal, social, family, professional, or academic life because you are using CMT&O more often than you need depression. Be aware that abusive use of CMT&O does not impair your quality of life.

15 - 24 points: Moderate - You show signs of possible CMT&O dependence related to moderate depression. You begin to have frequent problems due to the abusive use of CMT&O related to depression in certain situations. You should consider the impacts on your personal, social, family, professional, or academic life by using CMT&O related to depression more heavily than is recommended. You must learn to deal with CMT&O more consciously.

25 - 34 points: Severe - The use of CMT&O related to depression is causing significant problems in your personal, social, family, professional or academic life at a serious level. you must evaluate the consequences of these impacts that may be causing damages in these diverse areas, significantly impairing your quality of life. We recommend seeking guidance through professional help in specialized centers.

# Artigo 5

(Principal artigo da Dissertação de Mestrado)

The relationship of quality of life with the Major Depressive Disorder and Internet Addiction.

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(Submit Quality of Life Research)

The relationship of quality of life with the Major Depressive Disorder and Internet Addiction Guimarães FMCL,<sup>I,II</sup> Guedes E<sup>I</sup>, Santos HK<sup>II</sup>, Pádua MSKL<sup>I,II</sup> Campos CM<sup>I</sup> Gonçalves LL,<sup>I</sup> Nardi AE<sup>I,II</sup>, King ALS<sup>I,II</sup>.

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### Abstract

It is believed that individuals with major depressive disorder (MDD) and that interact daily with the computer / internet / social networks, may present mood alterations resulting from the accessed contents that can be positive or negative causing changes and interfering in the quality of life of the subject. **General objective**: To evaluate the relation of the MDD with the quality of life, dependence of the mentioned technologies and to contribute with scientific data for the creation and development of specific theory. **Method**: quantitative and qualitative study with 40 individuals with MDD and abusive use of the technologies, compared to 40 individuals without MDD and without abusive use of the technologies, both with application of specific. **Expected results**: to be able to describe in the scientific literature the relation of MDD with the dependence of the technologies and the impact on the quality of life of the individuals. **.Conclusion:** the quality of life can be negatively affected by the abusive use of the technologies as well as being corrected with MDD.

**Keywords**: depressive disorder, internet addiction, nomophobia, behavior, quality of life.

#### Introduction

The continuous advancement of technologies, computer / internet / social networks can produce significant transformations in the behavior and quality of life of individuals<sup>1</sup>. There seems to be no doubt that our customs and habits can be constantly altered as a result of the development of these technological apparatuses (Nomophobia)<sup>1</sup>. From these alterations arise new forms of social, personal and environmental organization which produce reflexes in all areas producing a subjectivity that is in constant transformation<sup>1</sup>.

With the advent of the new technologies<sup>2</sup> unexpected effects began to indicate the benefits, but also the damages caused by them in the life of individuals<sup>2</sup>. Among them, the individual neglects social connections to the detriment of a greater amount of time in the virtual world. There is concern about the significant damages<sup>3</sup> that have caused changes in the professional, social and family life of the individual. According to Lage<sup>4</sup> the symptoms of computer dependence / Internet / social networks are: Excessive concern on thoughts about the prior activity connected (online) when thinking about the next online session. Need to increase connected time to achieve the same satisfaction; repetitive unsuccessful attempts to stop and / or reduce the time of internet use and presence of agitation, irritability and / or depression when trying to reduce the time of use<sup>4</sup>.

Individuals with Major Depressive Disorder (MDD) <sup>1</sup> often resort to abusive use of the technologies in question as a resource for the reduction and / or elimination of depression, in an attempt to find better alternatives for their lives.

According to DSM-IV (2000)<sup>5</sup> (American Psychiatric Association DSM-IV), the diagnosis of DD is based on the following symptoms or on the occurrence of at least three of these symptoms:

• Depressive mood or irritability, anxiety and distress.

• Discouragement, easy tiredness, need for greater effort to do things, lack of motivation and apathy;

• Decrease of ability or inability to feel joy and pleasure in activities previously considered enjoyable;

· Lack of will and indecision;

 Feelings of fear, insecurity, hopelessness, despair, helplessness and emptiness;

• Pessimism, frequent and disproportionate ideas of guilt, low selfesteem, sense of meaninglessness in life;

• Loss or increase of appetite;

• Ideas of suicide.

Depression may have three degrees <sup>5</sup>: mild, moderate, and severe, and the intensity of symptoms may even lead to the idea of suicide.

The inappropriate use of the computer / internet / social network by the individuals can generate psychic and behavioral modifications bringing consequences at the psychological, cognitive and behavioral level<sup>6</sup>. In this study, we sought to establish a relationship between the pathological use of the Internet and depressive symptoms, among them, anxiety, sadness and low self-esteem. We want to verify that the longer individuals are on the Internet, the less time they spend with people in the real world, worsening their psychological well-being.

King et al.<sup>7</sup> report that they have identified increasing symptoms of depression in abusive users of the computer / Internet / social networks and that individuals dependent on it experience greater loneliness than other individuals<sup>7</sup>. The association between the pathological use of the Internet, MDD and feelings of loneliness and social anxiety<sup>8</sup> may suggest that there are possible psychological changes in certain individuals. In relation to this, we do not yet know if individuals with MDD use the Internet to feel included in a social context and to seek a relief for the symptoms or if they end up

aggravating the symptoms because they believe that in social networks everyone has a better life than theirs.

Individuals with MDD and pathological dependence on the Internet, when they feel unable to connect, may experience symptoms of anxiety, distress and nervousness intensifying already existing symptoms. And in this case, the symptoms are known as Nomophobia<sup>1</sup>.

Nomophobia<sup>1</sup> is a disorder of the modern world, it is the fear of being without communication with the Internet or other technologies. Nomophobia was coined in England from the expression "No Mobile Phobia", which means the phobia of to be left without the Mobile Phone<sup>1</sup>. Symptoms vary according to the intensity of dependence and begin with an exaggerated concern with staying connected.

Appolinário<sup>9</sup> suggests that there is a strong link between dependence on the Internet and MDD. According to the survey, Internet-dependent individuals may show an increase in depression than the individuals who were not classified as dependent. The research has raised the possibility that abusive use of the Internet is associated with depression, but what we do not know is what comes first, whether depressed individuals are drawn to the internet or whether the internet causes depression. The general goal is to define the relationship between MDD and quality of life in the pathological dependents of the technologies (computer / Internet / social networks) and to verify the positive and negative impacts of these technologies. The specific goals are to differentiate the depressed individuals with pathological dependence from the computer / internet / social network of frequent users for leisure and / or work. And also, contribute with scientific data for the creation and development of specific theory.

**Delineation**: Qualitative and quantitative study.

#### Methodology

Clinical trial performed with both sexes, ages between 18 and 65 years and a sample with 80 volunteers divided into two groups. The "Principal" group with 40 individuals with MDD and abusive use of computer / internet / social networks, and the second group "Control" composed of 40 individuals without MDD and without the abusive use of computer / internet / social networks. Both groups were evaluated using specific instruments. Among them: MINI<sup>10</sup>, which is a fast-paced (about 15 minutes) diagnostic neuropsychiatric interview (Version 5.0.0), which explores the major psychiatric disorders of Axis I of DSM-IV Psychiatric Association, 1994). Hamilton's Anxiety Scale<sup>11</sup> (Assessment of Anxiety Disorder), Hamilton's Depression Scale <sup>12</sup> (Depressive Behavior Assessment), CGI <sup>13</sup> (Global Clinical Impression) evaluating the overall clinical impression at the beginning and end of an intervention. The Internet Addiction Test (IAT<sup>14)</sup> is a questionnaire with 20 items that measure mild, moderate and severe levels of dependence on the Internet, and the WHOQOL-Abbreviated Questionnaire<sup>15</sup>, to evaluate the quality of life based on values, aspirations, pleasures and concerns.

Research volunteers to be considered abusive and / or Internet dependent users should achieve a 50 points score or above 50 points on the IAT (Internet Addiction Test) <sup>14</sup> validated scale.

Volunteers Recruitment was done through newspapers, social networks, or others. Individuals with MDD and abusive use of the mentioned technologies, underwent a screening where they were evaluated with interviews, scales and questionnaires mentioned above. After the individuals went through the medical and psychological evaluation and if they fulfilled the inclusion criteria in the research, they were asked to sign the "Free and Informed Consent Form" and became eligible to participate. All individuals who had an indication could receive drug treatment with antidepressants according to the psychiatric evaluation.

All volunteers in the Principal group did eight individual sessions of Cognitive-Behavioral Therapy(CBT<sup>16</sup>) with a specific CBT protocol aimed at treating MDD and conscious use of the technologies in question. The volunteers from the Principal group returned after the end of the eight sessions for a re-evaluation of the MDD and the verification of the decrease of the abusive use of the technologies. Then we set up a database and used the statistical program "R" to do the analysis of the results. We compared the Principal group with the Control group 40 patients without MDD, without technological dependence and who did not undergo therapy sessions.

### Local

The research was carried out by the multidisciplinary team of professionals in the area of Mental Health of the Delete-Uso Consciente de Tecnologi@s (Delete-Conscious Use of Techonologies) of the Instituto de Psiquiatria (Institute of Psychiatry) (IPUB) of the Universidade Federal do Rio de Janeiro (Federal University of Rio de Janeiro) (UFRJ).

## Population

The volunteers were students, workers, home-owners and others, both sexes, between 18 and 65 years old, with the characteristic of DD and abusive use of the computer / internet / social networks in daily life according to the selection criteria.

## **Inclusion criteria**

. Daily long-term use of computer / internet / social networks

- . Volunteer must have been diagnosed with depressive disorder.
- . Between 18 and 65 years old
- . Both sexes

## **Exclusion Criteria**

- . Illiterate individuals
- . To have some degree of mental retardation
- . To have any serious comorbidity

## Table 1 - Socio-demographic data

Category	Category classes (Absolu	ite and Percentage)	
Gender	Male	Female	
	16 (40%)	24(60%)	
Age	18 – 34	35 – 49	50 – 65
	27 (67,5%)	8 (20%)	5 (12,5%)
Marital status	Single	Married	Divorced
	30 (75%)	6 (15%)	4 (10%)
Schooling	Elementares/ Middle School	College education	Graduation
	8 (20%)	31 (77,5%)	1 (2,5%)
Occupation	Works/Studies	Unemployed/Retired	No occupation/
			Did not inform
	26 (65%)	11 (27,5%)	3 (7,5%)

#### Analysis of Instruments

From the application of the Inventory M.I.N.I.<sup>10</sup> we had the possibility to know the mental state of the individuals of the study in the various degrees they were occurring, the possibility of mental disorders, limitations and interferences in work and social functioning.

The scales for HAM-anxiety<sup>11</sup> and HAM-depression<sup>12</sup> evaluated these symptoms in the volunteers and indicated the degree they were occurring.

The questionnaires referring to the internet have drawn the general picture regarding the routine of use, time, interferences in the daily life of the individual, in the behavior and personal, social and familiar interactions. The individual's quality of life was assessed through the WHOQOL<sup>15</sup> (Short Version) questionnaire that characterized the different levels of the quality of life of each subject.

After collecting all the information obtained through research instruments, we created a Database, then we performed a statistical analysis with the **statistical program R** referring to the issues initially elaborated, in order to reach the results, conclusions and limitations of the study. **(Table 2)** 

	Before		After		Control	
	Average	Deviation	Average	Deviation	Average	Deviation
IAT	69,52	11,44	35,68	19,65	60,05	9,05
HAM-A	31,72	11,29	20,40	10,49	11,26	8,44
HAM-D	24,24	20,99	13,16	11,43	5,77	5,00
CGI	5,08	1,19	1,28	0,61	1,77	1,25
WHOQOL	69,32	10,40	84,00	12,42		

Table 2 - Average and standard deviations values of the tests

In Table 3, we present the correlations between the tests. It indicates that the correlation is positive between the variables IAT1<sup>4</sup>, HAM-D<sup>12</sup>, HAM-A<sup>11</sup>, CGI<sup>13</sup>, that is, when one increases, the other variables also increase, and it is negative for the case of variable WHOQOL<sup>15</sup>, that is, when values of the other variables grow, it decreases. The correlation is weak (below 0.5) for the pairs (IAT<sup>14</sup>, HAM-A) <sup>11</sup>, (HAM-A<sup>12</sup>, CGI) <sup>13</sup>, (HAM-A<sup>11</sup> CGI<sup>13</sup>) and (HAM-A<sup>11</sup>, WHOQOL<sup>15</sup>) and strong in the others. (**Table 3**).

	HAM-D	HAM-A	CGI	WHOQOL
IAT	0,50	0,24	0,86	-0,51
HAM-D		0,51	0,40	-0,53
HAM-A			0,21	-0,37
CGI				-0,53

### Table 3 - Correlation between the tests

#### Procedures

The volunteers of the study were informed of all the procedures for conducting the research, and having confirmed the participation, they signed the Term of Free and Informed Consent guaranteeing them all the privacy rights according to the Helsinki<sup>17</sup> declaration and had their evaluations scheduled. The volunteers committed themselves at the beginning of the study to return when requested, and the staff provided staff contacts for possible contingencies.

Patients with a diagnosis of MDD (Major Group) were referred to CBT<sup>16</sup> which is a brief therapy that works with specific techniques, among others: Psychoeducation (didactic components that clarify concepts and mechanisms of the disease), cognitive restructuring (restructuring of cognitive aspects that were misinterpreted), among others. Treatment with CBT<sup>16</sup> aimed to stimulate the patient to investigate, recognize and give new meaning to distorted associations related to depressive thoughts. CBT<sup>16</sup> was

also intended to encourage the patient to make conscious use of the technologies in question by showing them other possibilities.

The treatments with CBT<sup>16</sup> and medication, tend to evolve satisfactorily in cases of MDD. Regarding nomophobia<sup>1</sup>, as the treatments were being performed, the nomophobic symptoms (anxiety, depression, anxiety, nervousness, among others) related to the impossibility of being disconnected from the Internet tended to disappear in the same proportion<sup>1</sup>.

The Control group volunteers, who were without consequences or commitments, became aware of this result and received guidelines for a more adequate use of the technologies in the daily life. Furthermore, they learned the information that they had contributed to assist MDD technology dependents.

## **Protocol Attendance**

The care for patients with MDD was with eight sessions of CBT<sup>16</sup> aimed at remission and relapse of depressive symptoms, as well as dependence on the Internet. The sessions were individual sessions lasting forty minutes. The topics covered in the eight sessions were related to patients' moods in their day to day situations where depression occurs and to the improper use of the Internet.

Mood swings were presented according to the degree of depression. That could be: sadness, low self-esteem; lack of will to socialize; loss of routine activities; discouragement; feeling guilty always expecting the worst results; recognition of own faults; inappetence; insomnia; difficulty concentrating; slow thinking and pessimism.

## First session:

Psychoeducation - We talked with the patient about the situations that triggered his/her depression, as well as about his/her emotions, thoughts and actions during the depression. It is important for the patient to talk about their beliefs, since they affect their behavior. CBT<sup>16</sup> works on the patient's beliefs so that they can be modified to reduce depressive symptoms and inappropriate use of the technologies.

### Second session:

**Mood swings** - The topic addressed with the patient was related to mood changes that occurred in depression (sadness, low self-esteem, discouragement, pessimism, among others). The patient's understanding of these mood changes made it possible to identify them by promoting both behavioral and cognitive changes. We approached the abusive use of the Internet as a resource to deal with depression and the inappropriate use of technologies.

## Third session:

**Cognitive restructuring** - In this session the patient learned to identify the dysfunctional thoughts, negative patterns in his life related to depression and to prevent future episodes of it by altering these thoughts. CBT<sup>16</sup> enabled the patient to make dysfunctional thoughts into functional thoughts by correcting their distortions. The more the patient knows about his or her of history of symptoms the better prepared they are to perceive these

symptoms at the time they come back for the next session. The fact that the patient is aware of his/her symptoms allows him/her to understand the abusive use of the Internet.

**Obs. Provide worksheet 1 (See the attachment) for the 4th Session** - In this session the psychologist gives the patient a worksheet to be completed during the week and returned at the next session (4th session). The worksheet evaluates depression and internet usage. The patient should report for a week the observed symptoms related to depression, mood, self-confidence, usual and social activities, sleep and eating habits, concentration, thinking speed, creativity, interest in having fun, restlessness, use of the internet.

### Fourth session

**Spreadsheet Feedback 1 (see Annex)** - The psychologist should collect the worksheet given in the previous session that evaluated the relationship of the depressed patient to the technologies. In this worksheet, the patient should have described the symptoms observed during the week related to depression, mood, self-confidence, usual and social activities, sleep and eating habits, concentration, thinking speed, creativity, interest in fun, restlessness, skill to make decisions and use the internet. After observing the patient's reports contained in the worksheet, the psychologist should orientate according to the techniques of CBT<sup>16</sup> (cognitive restructuring, psychoeducation, among others) so that the subject creates new alternatives to deal with the described difficulties.

Note: Provide worksheet 2 (see Annex) to be returned in the 5th session - In this worksheet, the patient should mark leisure and daily activities performed during the week.

## Fifth session:

**Feedback from worksheet 2 (see Annex)** - The psychologist collects the worksheet handed to the patient in the previous session. This worksheet evaluates the daily and leisure activities and the degree of satisfaction or difficulty in performing these activities. The psychologist establishes strategies for the accomplishment of these tasks aiming at the improvement of the depression and the modification of problematic behavior related to the use of the Internet.

### Sixth session:

**Motivation** - Stimulate the motivation of the patient based on what was observed in worksheets 1 and 2. The psychologist will seek to praise the activities performed, enabling the patient to change the relationship with depression and Internet use. We will approach the patient with the difficulties encountered and propose alternatives so that they can perform these tasks in a more satisfactory way.

## Seventh session:

**Motivation** - (Repeat the previous session) Stimulate the motivation of the patient based on what was observed in worksheets 1 and 2. The psychologist will seek to value the activities performed, enabling it to change its relationship with depression and Internet use. We will approach the

patient with the difficulties encountered and propose alternatives so that they can perform these tasks in a more satisfactory way.

## **Eighth session:**

**Closing** - The psychologist in this session reinforces all the learning achieved during the course of the treatment, as well as remembers all the guidelines related to worksheets 1 and 2. The purpose of this last session is to prevent relapses in the negative behaviors that lead to depression, as well as the inappropriate use of the Internet or other technologies. At the end of treatment, the use of the Internet may no longer be an instrument used for social isolation, as well as for the symptoms of depression.

## Results

In the table, we present the result of the **t test** for the average difference of the points of the questionnaires. For the evaluation of the Main group, the group that received treatment for MDD and Internet addiction, "before and after", before and after the interventions, the paired **t test** was performed, while for the comparisons between these groups (before and after) and the Control group the unpaired t-test was performed.

Before – Afte		r Before - Contro		Ater – Control		
	т	p-valor	t	p-valor	т	p-valor
IAT	9,68	9,23e-10	3,50	1,11e-03	-5,82	2,15e-06
HAM-A	4,40	1,91e-04	7,78	1,36e-09	3,66	6,74e-04
HAM-D	4,55	1,30e-04	4,32	2,04e-04	3,05	4,74e-04
CGI	15,96	2,78e-14	10,68	7,92e-15	-2,09	4,10e-02
WHOQOL	-4,09	5,35e-05				

## Table 4 – Results of Test t between groups

## **Ethical aspects**

All volunteers received an individual explanation about the study and when they agreed to participate they signed the "Informed Consent Form", taking into account all the procedures performed, approved by the Comitê de Ética para Pesquisa (CEP) (Ethics Committee for Research) of the Instituto de Psiquiatria da Universidade Federal do Rio de Janeiro (IPUB / UFRJ) (Institute of Psychiatry of the Federal University of Rio de Janeiro) in accordance with the Declaration of Helsinki (1964) 17.

### Discussion

Table 1 shows that volunteers were randomly inserted into the Main and Control groups as can be seen by the percentage differences in data regarding gender, age, email, schooling and occupation. This demonstrates that there was no targeting in the assembly of the groups which is positive for research of this nature.

In Table 2, the averages of the IAT test results for the main group fell by about 50% (from 69.52 to 35.68) after receiving the described treatment, being even below the 60.05 of the control group, demonstrating the efficacy of the treatment. The same occurred for HAM-A, which reduced by about 65% (from 31, 7 to 20.4), while HAM-D reduced by 58% (from 24.24 to 13.16) and CGI reduced by about 75% (from 5.08 to 1.28). Consequently, the WHOQOL, which measures quality of life increased by about 20% due to the reductions reported here, confirming the correlation of the applied tests with the quality of life, when we consider the application of the appropriate treatment between before measurements and after measurements.

Table 3, which shows the correlations between the IAT, HAM-A, HAM-D, CGI and WHOQOL tests, demonstrates that the abusive use of digital devices causes a decrease in quality of life. The correlations between these tests were positive, although in the IAT cases with HAM-D (0.50), HAM-D with CGI (0.40), HAM-A with CGI (0.21) and HAM-A with WHOQOL they have been weak. Among the strong correlations, the IAT with CGI (0.82) stands out, demonstrating the importance of the General Clinical Impression and its consistency with the IAT that measures the dependence on the use of the Internet.

Finally, in Table 4, which presents the t-Test between the groups, it was observed that there was a significant reduction in the results of the IAT<sup>14</sup>, HAM-A<sup>11</sup>, HAM-D<sup>12</sup> and CGI<sup>13</sup> tests for the group that received treatment, -value lower than the standard value of 5% and even the value of

1% for IAT<sup>14</sup>, HAM-A<sup>11</sup> and HAM-D<sup>12</sup>. For the difference in the final results of the HAM-A<sup>11</sup> and HAM-D<sup>12</sup> tests between the group that received treatment (Main) and the control group, represented by the column "After and Control", the result of the group receiving treatment continues higher than control group, but for IAT<sup>14</sup> and CGI, <sup>13</sup> the result is lower than for the group receiving treatment. As for the WHOQOL<sup>15</sup> test result, there was an increase in the value of the test result in the Main group. The Main Group had received treatment during the period between the initial test and the final test thus demonstrating that there was increase in quality of life due to treatment.

In the light of these discussions, their results corroborate the findings of several authors, since according to Guedes at al there is a strong correlation between IA and MDD.

King et al<sup>7</sup> analyzed the temporal and reciprocal relationships between the presence of depressive symptoms and the abusive use of the Internet. The results suggest that depressive symptoms can lead to an increase in preference for online relationships, mood regulation and bring negative results to their lives. Depressed individuals tend to feel safer and less threatened by using the internet as a means of communicating with the real world.

Another study by Guedes et al<sup>19</sup> demonstrated that major depressive disorder was significantly correlated with dependence on the internet.

Excessive use of technology on a day-to-day basis can also be considered a misuse or lack of digital education.<sup>20</sup> Failure to know how to use technology in a conscious way often leads the individual to the abuse of the time and hours connected, to present physical and emotional consequences and intensify the symptoms. Depressive symptoms when present may be aggravated by inappropriate behavior in the use of technology in their daily lives.

We can say that the conscious use of technologies by individuals in working life is related to their achievement in work and to psychological wellbeing<sup>21</sup>. Individuals who can not perform well may have MDD and develop abusive Internet use<sup>21</sup>.

We can say that learning the conscious use of technologies from childhood is a prevention of the nowadays psychiatric disorders such as depression, anxiety, panic. Prevention can enable the individual to acquire the appropriate use of the technologies to benefit from them<sup>22</sup>.

The study by King et al<sup>23</sup> shows that individuals with MDD may develop dependence on the Internet as a resource for symptom reduction. We can say that the opposite can occur, that is, dependence on the Internet can lead individuals to have MDD. In this kind of behavior individuals relate to people in the virtual world, aggravating their isolation.

The study by Guedes et al<sup>18</sup> shows that individuals with MDD can resort to facebook as a resource to reduce their low self-esteem, insecurity and develop a dependency on it. Facebook enables individuals to present themselves with the desired image of themselves and it also makes possible to have the possibility of acceptance by others.

We observed as a limitation of the reduced number of participants in this study and we suggested future studies with a larger number of participants.

Another limitation is locomotion from the residence to the research site due to financial resources and the distant place of residence of the volunteers. We can also consider the difficulty of the volunteers in participating in the research because the work schedule coincides with the schedule of the treatment made available to them.

## Conclusion

According to the results we conclude that there was a significant reduction of the major depressive disorder, as well as the dependence of the Internet / social networks on the volunteers who underwent the research procedures (Main group). In addition, they showed an improvement in quality of life.

The study suggests that the use of Internet technologies by individuals with MDD can lead these individuals to develop a dependence on these applications and devices, leading to the aggravation of the disorder and causing harm to their family, social, academic and professional life impaired the quality of life.

It is important to learn the conscious use of technologies by individuals, as they can be effective in preventing MDD. We can say that both can bring benefits to their daily lives.

Further studies are needed to verify the interrelationship of emotional aspects of MDD and dependence of technologies with the quality of life of the individuals.

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## Discussão

Segundo Catriola Morrison and Gore H<sup>15</sup> existe uma forte ligação entre a dependência da internet (DI) e transtorno depressivo maior(TDM).Em sua pesquisa o grupo dos indivíduos dependentes da Internet era cinco vezes mais deprimidos do que os indivíduos que não foram classificados como dependentes. A pesquisa indicou que o uso abusivo da Internet está associado ao TDM, mas o que não sabemos é o que vem primeiro, se os indivíduos deprimidos são atraídos para a Internet ou se a Internet causa TDM<sup>15</sup>.

King et al sugere que os indivíduos com baixa autoestima, pouca motivação recorrem a Internet na tentativa de diminuir os sintomas, podendo desenvolver um uso abusivo da mesma. A Internet é usada como meio de comunicação com o mundo real<sup>14</sup>.

Akin A e Iskender M<sup>16</sup> em seu estudo com indivíduos deprimidos mostraram que os mesmos são mais propensos a ter dependência da internet. Sugerem que, se os indivíduos podem reduzir sua dependência de internet, eles podem reduzir seu nível de depressão.

O estudo de Guedes et al<sup>7</sup> mostra que os indivíduos com TDM podem recorrer ao facebook como recurso para diminuir sua baixa autoestima, insegurança desenvolvendo uma dependência do mesmo. O facebook possibilita aos indivíduos se apresentarem com a imagem desejada e também para ter a possibilidade da aceitação dos outros.

Estudos mostraram que a dependência da internet estava relacionada positivamente a uma diminuição de interações sociais, depressão, solidão e baixa autoestima.<sup>17,18</sup>

Podemos dizer que o uso consciente das tecnologias pelos indivíduos na vida profissional está relacionado a sua realização no trabalho e ao bem estar psicológico<sup>19,20</sup> Os indivíduos que não conseguem ter um bom desempenho profissional podem ter um TDM e desenvolverem um uso abusivo da internet.<sup>19,20</sup>

Não podemos negar que na atualidade o acesso as tecnologias pelas crianças ocorre cada vez mais cedo sendo de extrema importância a aprendizagem do uso consciente das tecnologias como uma prevenção de transtornos psiquiátricos, entre eles, depressão, ansiedade, pânico<sup>9</sup>.

O estudo de King et al<sup>21</sup> mostra que os indivíduos com TDM podem desenvolver uma dependência da internet como um recurso para a redução dos sintomas. Podemos dizer que o oposto pode ocorrer, isto é, a dependência da internet pode levar os indivíduos a terem TDM. Nesse sentido os indivíduos se relacionam com as pessoas no mundo virtual, agravando seu isolamento.

Os artigos mencionados acima e os apresentados na presente dissertação sugerem que existe uma relação do TDM com a DI na medida em que os indivíduos com esse transtorno podem desenvolver um uso abusivo da internet por recorrer a ela como "solução" para os sintomas depressivos.

Podemos dizer que os resultados de ambos indicam que os indivíduos com TDM tendem a se relacionar com o mundo de maneira virtual e não real levando-os a interagirem cada vez menos na sociedade.

Segundo os artigos citados os indivíduos com TDM e DI comprometem a suas vidas em diferentes aspectos, tais como, social, acadêmico e profissional. O mesmo foi constatado na pesquisa principal.

Os resultados apresentados pelos os artigos da dissertação assim como na literatura sugerem que a terapia cognitivo comportamental (TCC) mostrou ser um tratamento eficaz na redução dos sintomas do TDM e DI.

De acordo com os artigos citados e o principal da dissertação sugerem que a mudança do uso abusivo da internet está relacionado com a melhora do TDM, na medida em que o indivíduo não recorre a internet para lidar com o transtorno. O indivíduo passa a ter um uso consciente das tecnologias podendo usufrir dos seus benefícios melhorando sua qualidade de vida.

Observamos como limitação do estudo à amostra reduzida e sugerimos estudos futuros com um número maior de participantes.Também podemos considerar a distância que os voluntários teriam que percorrer da sua residência ao local da pesquisa em virtude da escassez de recurso financeiro e a dificuldade dos mesmos em participar da pesquisa devido ao horário do trabalho coincidir com o horário do tratamento disponibilizado.

Outra limitação foi o abandono dos voluntários da pesquisa decorrente da não adesão ao tratamento. Alguns não se vincularam ao mesmo e outros se vincularam, apresentaram melhoras tanto em relação aos sintomas do TDM e DI mas não deram continuidade devido as limitações citadas acima.

Sugerimos a realização de mais estudos sobre a relação do TDM com a DI em consequência da pouca quantidade de publicações neste tema nas bases de dados.

## Conclusão

No trabalho principal da Dissertação de Mestrado abordamos a relação do transtorno depressivo maior (TDM) com a dependência da internet (DI) e qualidade de vida entendemos a partir dos resultados que

houve uma redução significativa do TDM, consequentemente a diminuição da necessidade de uso da internet trazendo uma melhor qualidade de vida para os sujeitos.

O estudo principal da dissertação do Mestrado demonstrou que os indivíduos com TDM são mais propensos a desenvolverem DI na medida em que as tecnologias passam a ser o meio de comunicação com o mundo.

Essa relação com as tecnologias pode ajudar os indivíduos a sair do TDM quando conseguem se inserir em algum contexto social ou fazer amizades online e se sentirem menos solitários.

Por outro lado pode agravar os sintomas depressivos quando crêem em tudo que é postado, acreditando que a vida dos outros é bem melhor que a sua.

Consideramos importante a realização de estudos com temas atuais e pouco descritos na literatura como esses que tratam de dependência digital. Observamos que o uso de tecnologias do mundo digital pode trazer tanto benefícios quanto prejuízos para a vida dos indivíduos. Pudemos constatar que o uso abusivo e inadequado das tecnologias pode ter como consequência o afastamento dos indivíduos da sociedade e os prejudicar em diferentes aspectos da sua vida.

#### **Observações finais**

Senti-me realizada em fazer parte da equipe Delete-Uso consciente das tecnologi@s onde encontrei parceiros dispostos a colaborar em todas as fases da pesquisa.

O Instituto Delete – Uso Consciente de tecnologia@s visa realizar pesquisas científicas e descrever na literatura os impactos das tecnologi@s interferindo no cotidiano dos indivíduos e as consequências relacionadas aos mesmos. Além disso, oferece atendimento médico e psicológico para os indíviduos com o uso abusivo das tecnologi@s, assim como também os 10 passos do uso consciente de tecnologi@s.

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