GEORGIAN MEDICAL NEWS

ISSN 1512-0112

NO 11 (332) ноябрь 2022

ТБИЛИСИ - NEW YORK

ЕЖЕМЕСЯЧНЫЙ НАУЧНЫЙ ЖУРНАЛ

Медицинские новости Грузии

საქართველოს სამედიცინო სიახლენი

GEORGIAN MEDICAL NEWS

Monthly Georgia-US joint scientific journal published both in electronic and paper formats of the Agency of Medical Information of the Georgian Association of Business Press. Published since 1994. Distributed in NIS, EU and USA.

GMN: Georgian Medical News is peer-reviewed, published monthly journal committed to promoting the science and art of medicine and the betterment of public health, published by the GMN Editorial Board since 1994. GMN carries original scientific articles on medicine, biology and pharmacy, which are of experimental, theoretical and practical character; publishes original research, reviews, commentaries, editorials, essays, medical news, and correspondence in English and Russian.

GMN is indexed in MEDLINE, SCOPUS, PubMed and VINITI Russian Academy of Sciences. The full text content is available through EBSCO databases.

GMN: Медицинские новости Грузии - ежемесячный рецензируемый научный журнал, издаётся Редакционной коллегией с 1994 года на русском и английском языках в целях поддержки медицинской науки и улучшения здравоохранения. В журнале публикуются оригинальные научные статьи в области медицины, биологии и фармации, статьи обзорного характера, научные сообщения, новости медицины и здравоохранения. Журнал индексируется в MEDLINE, отражён в базе данных SCOPUS, PubMed и ВИНИТИ РАН. Полнотекстовые статьи журнала доступны через БД EBSCO.

GMN: Georgian Medical News – საქართველოს სამედიცინო სიახლენი – არის ყოველთვიური სამეცნიერო სამედიცინო რეცენზირებადი ჟურნალი, გამოიცემა 1994 წლიდან, წარმოადგენს სარედაქციო კოლეგიისა და აშშ-ის მეცნიერების, განათლების, ინდუსტრიის, ხელოვნებისა და ბუნებისმეტყველების საერთაშორისო აკადემიის ერთობლივ გამოცემას. GMN-ში რუსულ და ინგლისურ ენებზე ქვეყნდება ექსპერიმენტული, თეორიული და პრაქტიკული ხასიათის ორიგინალური სამეცნიერო სტატიები მედიცინის, ბიოლოგიისა და ფარმაციის სფეროში, მიმოხილვითი ხასიათის სტატიები.

ჟურნალი ინდექსირებულია MEDLINE-ის საერთაშორისო სისტემაში, ასახულია SCOPUS-ის, PubMed-ის და ВИНИТИ РАН-ის მონაცემთა ბაზებში. სტატიების სრული ტექსტი ხელმისაწვდომია EBSCO-ს მონაცემთა ბაზებიდან.

WEBSITE

www.geomednews.com

К СВЕДЕНИЮ АВТОРОВ!

При направлении статьи в редакцию необходимо соблюдать следующие правила:

1. Статья должна быть представлена в двух экземплярах, на русском или английском языках, напечатанная через **полтора интервала на одной стороне стандартного листа с шириной левого поля в три сантиметра**. Используемый компьютерный шрифт для текста на русском и английском языках - **Times New Roman** (**Кириллица**), для текста на грузинском языке следует использовать **AcadNusx.** Размер шрифта - **12**. К рукописи, напечатанной на компьютере, должен быть приложен CD со статьей.

2. Размер статьи должен быть не менее десяти и не более двадцати страниц машинописи, включая указатель литературы и резюме на английском, русском и грузинском языках.

3. В статье должны быть освещены актуальность данного материала, методы и результаты исследования и их обсуждение.

При представлении в печать научных экспериментальных работ авторы должны указывать вид и количество экспериментальных животных, применявшиеся методы обезболивания и усыпления (в ходе острых опытов).

4. К статье должны быть приложены краткое (на полстраницы) резюме на английском, русском и грузинском языках (включающее следующие разделы: цель исследования, материал и методы, результаты и заключение) и список ключевых слов (key words).

5. Таблицы необходимо представлять в печатной форме. Фотокопии не принимаются. **Все цифровые, итоговые и процентные данные в таблицах должны соответствовать таковым в тексте статьи**. Таблицы и графики должны быть озаглавлены.

6. Фотографии должны быть контрастными, фотокопии с рентгенограмм - в позитивном изображении. Рисунки, чертежи и диаграммы следует озаглавить, пронумеровать и вставить в соответствующее место текста **в tiff формате**.

В подписях к микрофотографиям следует указывать степень увеличения через окуляр или объектив и метод окраски или импрегнации срезов.

7. Фамилии отечественных авторов приводятся в оригинальной транскрипции.

8. При оформлении и направлении статей в журнал МНГ просим авторов соблюдать правила, изложенные в «Единых требованиях к рукописям, представляемым в биомедицинские журналы», принятых Международным комитетом редакторов медицинских журналов - http://www.spinesurgery.ru/files/publish.pdf и http://www.nlm.nih.gov/bsd/uniform_requirements.html
В конце каждой оригинальной статьи приводится библиографический список. В список литературы включаются все материалы, на которые имеются ссылки в тексте. Список составляется в алфавитном порядке и нумеруется. Литературный источник приводится на языке оригинала. В списке литературы сначала приводятся работы, написанные знаками грузинского алфавита, затем кириллицей и латиницей. Ссылки на цитируемые работы в тексте статьи даются в квадратных скобках в виде номера, соответствующего номеру данной работы в списке литературы. Большинство цитированных источников должны быть за последние 5-7 лет.

9. Для получения права на публикацию статья должна иметь от руководителя работы или учреждения визу и сопроводительное отношение, написанные или напечатанные на бланке и заверенные подписью и печатью.

10. В конце статьи должны быть подписи всех авторов, полностью приведены их фамилии, имена и отчества, указаны служебный и домашний номера телефонов и адреса или иные координаты. Количество авторов (соавторов) не должно превышать пяти человек.

11. Редакция оставляет за собой право сокращать и исправлять статьи. Корректура авторам не высылается, вся работа и сверка проводится по авторскому оригиналу.

12. Недопустимо направление в редакцию работ, представленных к печати в иных издательствах или опубликованных в других изданиях.

При нарушении указанных правил статьи не рассматриваются.

REQUIREMENTS

Please note, materials submitted to the Editorial Office Staff are supposed to meet the following requirements:

1. Articles must be provided with a double copy, in English or Russian languages and typed or compu-ter-printed on a single side of standard typing paper, with the left margin of **3** centimeters width, and **1.5** spacing between the lines, typeface - **Times New Roman** (**Cyrillic**), print size - **12** (referring to Georgian and Russian materials). With computer-printed texts please enclose a CD carrying the same file titled with Latin symbols.

2. Size of the article, including index and resume in English, Russian and Georgian languages must be at least 10 pages and not exceed the limit of 20 pages of typed or computer-printed text.

3. Submitted material must include a coverage of a topical subject, research methods, results, and review.

Authors of the scientific-research works must indicate the number of experimental biological species drawn in, list the employed methods of anesthetization and soporific means used during acute tests.

4. Articles must have a short (half page) abstract in English, Russian and Georgian (including the following sections: aim of study, material and methods, results and conclusions) and a list of key words.

5. Tables must be presented in an original typed or computer-printed form, instead of a photocopied version. **Numbers, totals, percentile data on the tables must coincide with those in the texts of the articles.** Tables and graphs must be headed.

6. Photographs are required to be contrasted and must be submitted with doubles. Please number each photograph with a pencil on its back, indicate author's name, title of the article (short version), and mark out its top and bottom parts. Drawings must be accurate, drafts and diagrams drawn in Indian ink (or black ink). Photocopies of the X-ray photographs must be presented in a positive image in **tiff format**.

Accurately numbered subtitles for each illustration must be listed on a separate sheet of paper. In the subtitles for the microphotographs please indicate the ocular and objective lens magnification power, method of coloring or impregnation of the microscopic sections (preparations).

7. Please indicate last names, first and middle initials of the native authors, present names and initials of the foreign authors in the transcription of the original language, enclose in parenthesis corresponding number under which the author is listed in the reference materials.

8. Please follow guidance offered to authors by The International Committee of Medical Journal Editors guidance in its Uniform Requirements for Manuscripts Submitted to Biomedical Journals publication available online at: http://www.nlm.nih.gov/bsd/uniform_requirements.html
http://www.icmje.org/urm_full.pdf
In GMN style for each work cited in the text, a bibliographic reference is given, and this is located at the end of the article under the title "References". All references cited in the text must be listed. The list of references should be arranged alphabetically and then numbered. References are numbered in the text [numbers in square brackets] and in the reference list and numbers are repeated throughout the text as needed. The bibliographic description is given in the language of publication (citations in Georgian script are followed by Cyrillic and Latin).

9. To obtain the rights of publication articles must be accompanied by a visa from the project instructor or the establishment, where the work has been performed, and a reference letter, both written or typed on a special signed form, certified by a stamp or a seal.

10. Articles must be signed by all of the authors at the end, and they must be provided with a list of full names, office and home phone numbers and addresses or other non-office locations where the authors could be reached. The number of the authors (co-authors) must not exceed the limit of 5 people.

11. Editorial Staff reserves the rights to cut down in size and correct the articles. Proof-sheets are not sent out to the authors. The entire editorial and collation work is performed according to the author's original text.

12. Sending in the works that have already been assigned to the press by other Editorial Staffs or have been printed by other publishers is not permissible.

Articles that Fail to Meet the Aforementioned Requirements are not Assigned to be Reviewed.

ავტორთა საყურადღებოდ!

რედაქციაში სტატიის წარმოდგენისას საჭიროა დავიცვათ შემდეგი წესები:

1. სტატია უნდა წარმოადგინოთ 2 ცალად, რუსულ ან ინგლისურ ენებზე,დაბეჭდილი სტანდარტული ფურცლის 1 გვერდზე, 3 სმ სიგანის მარცხენა ველისა და სტრიქონებს შორის 1,5 ინტერვალის დაცვით. გამოყენებული კომპიუტერული შრიფტი რუსულ და ინგლისურენოვან ტექსტებში - **Times New Roman (Кириллица)**, ხოლო ქართულენოვან ტექსტში საჭიროა გამოვიყენოთ **AcadNusx.** შრიფტის ზომა – 12. სტატიას თან უნდა ახლდეს CD სტატიით.

2. სტატიის მოცულობა არ უნდა შეადგენდეს 10 გვერდზე ნაკლებს და 20 გვერდზე მეტს ლიტერატურის სიის და რეზიუმეების (ინგლისურ, რუსულ და ქართულ ენებზე) ჩათვლით.

3. სტატიაში საჭიროა გაშუქდეს: საკითხის აქტუალობა; კვლევის მიზანი; საკვლევი მასალა და გამოყენებული მეთოდები; მიღებული შედეგები და მათი განსჯა. ექსპერიმენტული ხასიათის სტატიების წარმოდგენისას ავტორებმა უნდა მიუთითონ საექსპერიმენტო ცხოველების სახეობა და რაოდენობა; გაუტკივარებისა და დაძინების მეთოდები (მწვავე ცდების პირობებში).

4. სტატიას თან უნდა ახლდეს რეზიუმე ინგლისურ, რუსულ და ქართულ ენებზე არანაკლებ ნახევარი გვერდის მოცულობისა (სათაურის, ავტორების, დაწესებულების მითითებით და უნდა შეიცავდეს შემდეგ განყოფილებებს: მიზანი, მასალა და მეთოდები, შედეგები და დასკვნები; ტექსტუალური ნაწილი არ უნდა იყოს 15 სტრიქონზე ნაკლები) და საკვანძო სიტყვების ჩამონათვალი (key words).

5. ცხრილები საჭიროა წარმოადგინოთ ნაბეჭდი სახით. ყველა ციფრული, შემაჯამებელი და პროცენტული მონაცემები უნდა შეესაბამებოდეს ტექსტში მოყვანილს.

6. ფოტოსურათები უნდა იყოს კონტრასტული; სურათები, ნახაზები, დიაგრამები - დასათაურებული, დანომრილი და სათანადო ადგილას ჩასმული. რენტგენოგრამების ფოტოასლები წარმოადგინეთ პოზიტიური გამოსახულებით **tiff** ფორმატში. მიკროფოტოსურათების წარწერებში საჭიროა მიუთითოთ ოკულარის ან ობიექტივის საშუალებით გადიდების ხარისხი, ანათალების შეღებვის ან იმპრეგნაციის მეთოდი და აღნიშნოთ სურათის ზედა და ქვედა ნაწილები.

7. სამამულო ავტორების გვარები სტატიაში აღინიშნება ინიციალების თანდართვით, უცხოურისა – უცხოური ტრანსკრიპციით.

8. სტატიას თან უნდა ახლდეს ავტორის მიერ გამოყენებული სამამულო და უცხოური შრომების ბიბლიოგრაფიული სია (ბოლო 5-8 წლის სიღრმით). ანბანური წყობით წარმოდგენილ ბიბლიოგრაფიულ სიაში მიუთითეთ ჯერ სამამულო, შემდეგ უცხოელი ავტორები (გვარი, ინიციალები, სტატიის სათაური, ჟურნალის დასახელება, გამოცემის ადგილი, წელი, ჟურნალის №, პირველი და ბოლო გვერდები). მონოგრაფიის შემთხვევაში მიუთითეთ გამოცემის წელი, ადგილი და გვერდების საერთო რაოდენობა. ტექსტში კვადრატულ ფჩხილებში უნდა მიუთითოთ ავტორის შესაბამისი N ლიტერატურის სიის მიხედვით. მიზანშეწონილია, რომ ციტირებული წყაროების უმეტესი ნაწილი იყოს 5-6 წლის სიღრმის.

9. სტატიას თან უნდა ახლდეს: ა) დაწესებულების ან სამეცნიერო ხელმძღვანელის წარდგინება, დამოწმებული ხელმოწერითა და ბეჭდით; ბ) დარგის სპეციალისტის დამოწმებული რეცენზია, რომელშიც მითითებული იქნება საკითხის აქტუალობა, მასალის საკმაობა, მეთოდის სანდოობა, შედეგების სამეცნიერო-პრაქტიკული მნიშვნელობა.

10. სტატიის ბოლოს საჭიროა ყველა ავტორის ხელმოწერა, რომელთა რაოდენობა არ უნდა აღემატებოდეს 5-ს.

11. რედაქცია იტოვებს უფლებას შეასწოროს სტატია. ტექსტზე მუშაობა და შეჯერება ხდება საავტორო ორიგინალის მიხედვით.

12. დაუშვებელია რედაქციაში ისეთი სტატიის წარდგენა, რომელიც დასაბეჭდად წარდგენილი იყო სხვა რედაქციაში ან გამოქვეყნებული იყო სხვა გამოცემებში.

აღნიშნული წესების დარღვევის შემთხვევაში სტატიები არ განიხილება.

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Содержание:

GEORGIAN MEDICAL NEWS
No 11 (332) 2022

ADAPTATION AND PSYCHOMETRIC PROPERTIES OF GEORGIAN VERSION OF THE 10-ITEM CONNOR-DAVIDSON RESILIENCE SCALE

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Abstract.

Background: The 10-item Connor-Davidson Resilience Scale (CD-RISC-10) is a tool for measuring resilience. The scale has demonstrated solid psychometric properties in different populations.

Objective: The objective of this study was to adapt the CD-RISC-10 into Georgian and explore the psychometric characteristics of the Georgian version of 10-item CD-RISC for Georgian youth.

Methods: Design: Descriptive cross-sectional study. Sample: study involved university students of age range 17-25. Instruments: along with the 10-item CD-RISC, measures of depression, problematic internet use (PIU) and parental psychological control(PPC) were administered.

Exploratory (EFA) and Confirmatory (CFA) analyses were conducted to assess internal reliability and validity through internal consistency, construct validity, model fitness.

Results: The scale demonstrated adequate reliability (Cronbach's $\alpha = 0.87$) and satisfactory validity. Connor-Davidson Resilience Scale showed significant associations with the measures of problematic internet use, depression, and parental psychological control. Factor analyses revealed that resilience was best explained by a one factor solution.

Conclusions: The scale has acceptable psychometric properties as an instrument to measure resilience in Georgian youth.

Key words. Resilience, 10-item cd-risc, adaptation, georgian, university students, reliability, validity.

Introduction.

The concept of resilience attracts attention of researchers from different academic fields since 60's [1]. In the beginning it was studied in developmental psychology and was linked with attachment theory. Research reached it's peak in the 80's [2-5].

In the recent years resilience aquires more importance in the face of global challenges as covid-pandemic, terrorism, war, natural disasters. It helps us in better understanding psychological health of different population including adolescents and emerging adults.

Resilience has been defined as: "the capacity of the individual to overcome adversity" and "ability to bounce back" [6]. Researchers consider resilience as a capacity of a biopsychosocial system [7] of coping with distress and challenges so that in this process individual organism maintain satisfactory level of functioning [8-11].

More contemporary view condivides an idea of resilience as a process, dynamic adaptation to the challenges. Its activation depends on the strength and a type of stressful event [1,12,13]. Thus, resilience can be understood as a "multidimensional concept, including process, dynamic, capacity, and outcome dimensions" [14-19].

Many studies demonstrated the evidence that resilience is linked with mental disorders[1,20-22]. It has been shown the protective role of resilience for organism against different stressors. Particularly, it's role in the prevention and rehabilitation from the substance use dependence [14-16]. Research shows that resilience operates as a buffer between risk factors and problematic internet use as well [21]. It is well documented resilience's influence on depression [1,20,21]. Research also emphasizes resilience's role for vulnerable adolescents [23].

It seems necessary to have valid and reliable instrument to conduct research in the field of mental health especially in the face of crises [6,24]. Measurement of resilience is more difficult since it can differ with regard of the place, population, nature of threat. And is even more difficult to develop the instrument that will embrace larger possible contexts. Between lots of them some are outstanding by their psychometric properties, Brief Resilience Scale(BRS), Resilience Scale for Adults(RSA), and CD-RISC-10 among them [6,22].

The 10-item Connor-Davidson Resilience Scale has been applied in many research and on the different population [11,25-27]. It has been created by the authors after 25-item original scale which has demonstrated some inconsistency and was modified into 10-item version. It demonstrated sound psychometric qualities and has been translated into many languages. This scale is supported by a good theoretical framework as well [6].

This paper is first study of adaptation of this 10-item scale in Georgian language and exploring its psychometric properties.

Methods.

Study design and participants.

The current research addresses adaptation and psychometric properties of Connor Davidson 10-item Resilience Scale. Both descriptive and inferential statistics were used for data analysis.

Exploratory factor analysis is used to assess the underlying factors of each major scale. Regression analysis was used to assess resilience mediating effect in the relationship between the parental psychological control (PPC), depression and problematic internet use (PIU). Reliability analysis is conducted through Cronbach Alpha.

Our first aim was translation and adaptation of Connor-Davidson 10-item Resilience Scale into Georgian language. Our second aim was assessment of reliability and validity (face, content, and construct validity) of the instrument.

Adaptation process consisted in following steps according to the recommendations of the International Test Commission(ICT) [28].

First, we obtained permission for translation and the use from the developers of CD-RISC-10. We followed the steps and recommendations of ICT guidelines [28]. We translated and evaluated correspondence of measured construct and the items' content for the selected population. These steps consisted in:

(1) Translation from English by two independent translators; (2) these two versions were compared by researchers; (3) back-translation was performed by the third independent translator (4); after discussing with expert panel composed of 7 psychology experts (3) faculty members and 4 external experts), prefinal version of the scale was reached and evaluated the content validity of the scale; it was considered acceptable. Experts made some semantical changes in the items.

(5) Then 10 bilingual students were recruited online for preliminary try out to assess readability of the instrument. Instructions, items, and response format was assessed as clear by the students. (6) This version and description of the translation procedure were sent to the developers of CD-RISC for the approval. After that we reached final version of questionnaire which was redacted by the Georgian language specialist.

(7) We conducted pilot study of 170 participants to evaluate reliability and construct validity.

(8) Next, we conducted large scale study. We run Exploratory Factor Analysis (EFA), Confirmatory Factor Analysis (CFA) and regression analysis to establish reliability and validity of the Scale.

Data collection and participants.

A purposive sampling method was performed in students of Tbilsi State University from November to December 2021. This technique consists in recruiting all available units who are willing to participate and meet the inclusion criteria in the study. Students were eligible to select following the criteria: (1) Age range 17-25; (2) being volunteer; (3) living in Georgia.

Test adaptation guidelines [28] suggest that sample size for exploratory factor analysis should be 5-10 participants for each item and should not be lower than 100 participants in total; The sample size should be 100–200 for confirmatory factor analysis.

Questionnaires were distributed to the university students via e-mail list, a total of 1437 participants completed the questionnaire. After excluding non-eligible responses for the present study and responses with missing values 1098 participants left for the main analysis.

Students were informed about aims of the study. All participants approved to complete the data collection and signed an informed consent. Ethics committee approval was previously obtained by the Center for Mental Health and Substance Abuse Prevention's Ethics committee.

Measurement instruments.

Four scales were used in a survey along with demographic questions: Connor-Davidson Resilience Scale 10 (CD-RISC-10), The nine-item version Problematic Internet Use Questionnaire (PIUQ-9), 6-ITEM Kutcher Adolescent Depression Scale and Dependency oriented and Achievement oriented Psychological Control Scale (DAPCS).

Connor-Davidson Resilience Scale 10 (CD-RISC-10).

CD-RISC-10 scale is 10-item instrument for measurement of resilience as a coping ability with 5-point Likert scale answers. Constructs measured are flexibility - items 1-5; self-efficacy – items 2,4,9; emotion regulation – item 10; optimism – items 3,6,8; cognitive focus, attention during stress - it 7 [29]. Cronbach's alpha for this study is 0.87.

The nine-item version Problematic Internet Use Questionnaire (PIUQ-9) in different languages.

PIUQ-9 is proved measurement tool for problematic internet use. Measure was developed by Z. Demetrovic et al. it demonstrated good psychometric properties during different studies. Questionnaire measures 3 factors: obsession (items 3,6,9), neglect (2,5,8), control disorder (1,4,7) and comprises of 9-item. 5-point Likert scale with answers from 1 (never) to 5 (always/almost always). Cronbach alpha for this scale was 0.84.

Dependency oriented and Achievement oriented Psychological Control Scale(DAPCS).

This measure was developed by B. Soenens et al., 2010. The scale consists of two subscales: dependency oriented psychological control and Achievement oriented psychological control. Each of them has 10 items which are assessed by 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The Cronbach alpha value calculated in this study was 0.95.

6-ITEM Kutcher Adolescent Depression Scale.

It was developed by S. Kutcher, 2008. It demonstrated good psychometric properties for this sample. constructs: 1,2,3,4,5 - main symptoms of depression; 6- suicidal thoughts and physical symptoms.

Answers were assessed with 4-point Likert scale from 1(hardly ever) to 4(all of the time). Cronbach alpha was 0.87.

Data analysis.

Data normality test.

We performed several Data Normality tests to determine whether sample data has been drawn from a normally distributed population. Data normality was assessed through descriptive (mean, median mode) and skewness and kurtosis values. Univariate normality tests were conducted through Kolmogorov-Smirnov, and Shapiro-Wilk tests. Multivariate normality tests were also conducted.

Exploratory factor analysis.

In order to establish reliability and validity of the CD-RISC we conducted structural equation modeling(SEM), specifically EFA and CFA. We used Exploratory factor analysis to assess the underlying factors of each major scales [30-35]. We performed several tests within EFA: Bartlett Sphericity test(Sampling Adequacy), KMO Measure - Kaiser-Meyer-Olkin (KMO) measure tests the sampling adequacy for each variable in the model and the complete model [24].

Confirmatory factor analysis.

It's a commonly used method to investigate construct validity [36]. It can be assessed through factor loadings. Construct validity has two aspects: convergent and divergent validity. One way they can be assessed is through the study of relationships with other instruments. They should measure other aspects of the construct with which a positive or negative relationship is supposed [31,35,37].

We proposed the model where resilience mediates the relationship between problematic internet use(PIU), depression and parental psychological control(PPC) in Georgian students.

Baron and Kenny [38] clarified the nature of a mediation: the mediating effects are established, when one variable interposes the relationship between two variables [36,39].

In this study, resilience is considered as a mediating variable between parental psychological control as continuous stress factor and adolescent problematic internet use and depressive symptoms.

We hypothesized that resilience as mediator, could correlate negatively with PPC and also negatively with PIU and depression [26,38,40-43]. We performed series of regression analysis.

Hypothesis testing.

To test our hypothesis, we used several tests: standard measures of fit in CFA, including the root mean squared error approximation (RMSEA), minimum discrepancy per degree of freedom (CMIN/DF), goodness-of-fit index (GFI), adjusted goodness-of-fit index (AGFI), normed fit index (NFI), non-normed fit index (NNFI), and comparative fit index (CFI) [44-46].

Hypothesis testing and mediation analysis were conducted in AMOS 22 [IBM Corp. Released 2013. IBM SPSS Statistics for Windows, Version 22.0. Armonk, NY: IBM Corp].

Results are presented in form of tables and graphs in the attached Appendix.

Results.

This chapter presents the data analysis and findings. Demographic details of the participants are presented.

Demographic information of participants.

The majority of participants were female 77,8% (n=854), while 22.2% participants were male (n=244). Mean age of participants was 19.54. On average participants are using internet for almost 9 years with standard deviation of 3.32 years). 48.36% participants use the internet for study and work purpose, other 33.3% users use internet for social networking, while the remaining users use internet for watching music videos 12.84%, games 2.46%, shopping 0.18% and other purposes 2.82%. Table 1 shows the complete details of participants' demographic preliminary information.

Table 1. *Participants' demographic preliminary information (n=1098).*

	Demographic Information	Frequency	Percentage
Gender			
Male	Male	244	22.2%
	Female	854	77.8%
Most Often use of the Internet			
	Study / work	534	48.36%
	social network	365	33.3%
	Watching music videos and movies	140	12.8%
	Other	31	2.8%
	Games	27	2.46%
	Shopping	1	0.18%

Data normality test.

Normality test values, specifically kurtosis and skewness values were within ±2 range. Four items had Kurtosis values between 2 to 5 which is still considered normally distributed data due to large sample size. It was found that univariate and multivariate normality assumptions were tenable. It is, therefore, appropriate to use multivariate statistical analysis on this data. Table 2 shows the descriptive statistics of all 45 items.

Table 2. *Descriptive statistics of questionnaire items.*

Item	Mean	Std. Deviation	Skewness	Kurtosis
PIUQ1	3.54	1.25	-0.44	-0.81
PIUQ2	2.85	1.18	0.11	-0.87
PIUQ3	2.49	1.28	0.47	-0.85
PIUQ4	3.24	1.36	-0.20	-1.16
PIUQ5	3.15	1.33	-0.13	-1.18
PIUQ6	2.69	1.37	0.35	-1.11
PIUQ7	1.93	1.28	1.18	0.15
PIUQ8	2.58	1.38	0.42	-1.07
PIUQ9	2.33	1.26	0.64	-0.63
KADS1	2.91	0.99	-0.47	-0.87
KADS2	2.58	1.15	-0.11	-1.41
KADS3	3.18	0.98	-0.88	-0.43
KADS4	2.83	1.11	-0.41	-1.21
KADS5	2.76	1.09	-0.30	-1.24
KADS6	1.54	0.92	1.58	1.25
DPC1	1.81	1.18	1.35	0.80
DPC2	1.74	1.18	1.50	1.09
DPC3	1.64	1.19	1.77	1.87
DPC4	2.17	1.36	0.87	-0.55
DPC5	2.23	1.45	0.82	-0.78
DPC6	2.00	1.32	1.14	0.02
DPC7	1.43	0.95	2.39	5.00
DPC8	1.92	1.28	1.23	0.25
DPC9	1.42	0.92	2.38	5.07
DPC10	1.94	1.34	1.25	0.18
APC1	1.87	1.26	1.30	0.46
APC2	2.18	1.33	0.91	-0.38
APC3	1.80	1.22	1.42	0.86
APC4	1.47	1.05	2.31	4.29
APC5	2.13	1.37	0.94	-0.46
APC6	1.65	1.18	1.78	1.93
APC7	1.66	1.20	1.78	1.90
APC8	1.54	1.12	2.09	3.22
APC9	1.90	1.29	1.27	0.33
APC10	1.93	1.32	1.23	0.18
RS1	2.74	1.15	-0.62	-0.46
RS2	2.71	1.09	-0.59	-0.30
RS3	2.32	1.35	-0.32	-1.07
RS4	2.73	1.25	-0.66	-0.58
RS5	2.49	1.27	-0.45	-0.85
RS6	3.10	1.10	-1.08	0.26
RS7	2.05	1.29	-0.12	-1.03
RS8	2.57	1.24	-0.51	-0.70
RS9	3.21	1.10	-1.36	0.99
RS10	2.76	1.20	-0.71	-0.44

Exploratory factor analysis results of Connor Davidson resilience scale 10 (cd-risc-10).

Exploratory Factor Analysis was run to determine the underlying latent traits of Connor-Davidson Resilience Scale 10 (CD-RISC-10) with 10 items. The results are presented below. EFA analysis was performed using maximum likelihood extraction method. The Kaiser rule (Eigen value greater 1) was applied to determine the possible number of factors.

Connor-Davidson Resilience Scale contains 10 items with one hypothesized factor. The EFA analysis also indicated that these 10 items have emerged into one factor. The one-factor solution produced 46.50 of total variance. The KMO and Bartlett's test statistics value was 0.91, and the corresponding chi-square value for Bartlett's Test of Sphericity was approximately 4909.62 (45), p<.001. The factor loading values were ranging from 0.39 to 0.75, with the average loading value of 0.63. The factor loading for one-factor solution of 10 items CD-RISC presented in Table 3.

Table 3. *Factor Loading of Connor-Davidson Resilience Scale 10.*

Item	Factor
	1
RS1	0.553
RS2	0.718
RS3	0.388
RS4	0.536
RS5	0.638
RS6	0.730
RS7	0.659
RS8	0.691
RS9	0.652
RS10	0.694

Confirmatory factor analysis results for resilience scale.

In Structural Equation Modeling (SEM), the model fit determines how well the model fits the sample data. To examine model fit, the result of confirmatory factor analysis should be investigated which includes many indices [39,44,47]. The validity of resilience scale was tested through CFA analysis.

A confirmatory factor analysis was run to validate the results of exploratory factor analysis for resilience scale. The CFA was run on IBM AMOS using maximum likelihood estimation. The overall the factor loadings were good in all items ranging from 0.39 to 0.73, average standardized loading value was 0.63, which is considered acceptable value. The standardized factor loading, and unstandardized beta estimations are reported in Table 4.

Reliability.

Reliability is the degree of consistency of an instrument. A reliable instrument is that which gives identical score at all times [32]. Reliability Analysis was conducted using the internal consistency method through Cronbach's Alpha coefficients. As shown in Table 4, the internal consistency coefficient was .87 which shows good reliability.

Table 4. *Confirmatory Factor Analysis Results Resilience Scale.*

Factor	Items	Unstandardized Beta Estimate	Standardized Beta Estimate	S.E.	P	Cronbach's Alpha
	RS1	1	0.553			
	RS2	1.231	0.718	0.054	<.001	
	RS3	0.824	0.388	0.068	<.001	
	RS4	1.048	0.536	0.067	<.001	
Resilience	RS5	1.269	0.638	0.074	<.001	0.87
	RS6	1.260	0.730	0.067	<.001	
	RS7	1.333	0.659	0.074	<.001	
	RS8	1.345	0.691	0.073	<.001	
	RS9	1.127	0.652	0.066	<.001	
	RS10	1.311	0.694	0.071	<.001	

Hypothesis testing.

There are several fit indices values to determine the model fit. According to Table 5, the CMIN value and RMR fit indices values were in acceptable range. The GFI, NFI, and RMSEA value was good fit index value. Overall, the model fits well with one factor model as suggested by the EFA results. The CFA model for resilience scale along with standardized estimates is shown in Figure 1 (see appendix).

Table 5. *CFA model fit indices of the resilience scale.*

Compliance Criteria	Good Fit*	Acceptable Harmony**	Model
CMIN ($\chi 2$/df)	0≤ ≤2	1-5	3.8**
GFI	0.95≤GFI≤1	0.90≤GFI≤0.95	0.97*
CFI	0.97≤CFI≤1	0.95≤CFI≤0.97	0.98*
NFI	0.95≤NFI≤1	0.90≤NFI≤0.95	0.95*
RMR	0≤RMR≤0.05	0.05≤RMR≤0.08	0.06**
RMSEA	0≤RMSEA≤0.05	0.05≤RMSEA≤0.08	0.004*

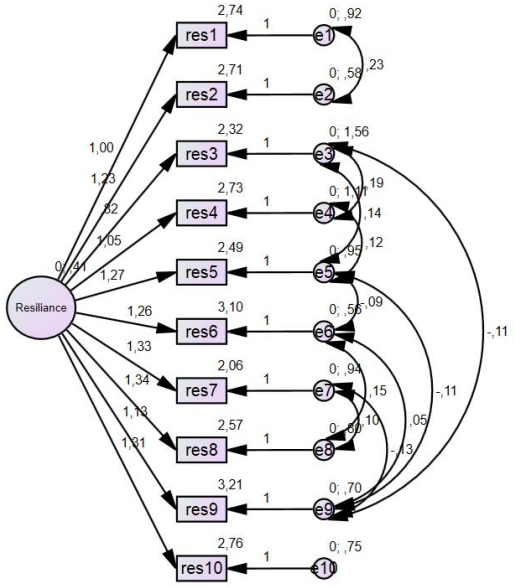

Figure 1. *Final CFA model and standardized estimation of Resilience Scale.*

Construct validity.

Resilience as a mediator between parental psychological control and problematic internet use.

In this study, resilience was considered as a mediating factor in the relationship between Parental Psychological Control and Problematic Internet Use, as depict in following figure.

Model 1 is based on the resilience as a Mediator between Parental Psychological Control and Problematic Internet Use. We used the four steps regression analysis as suggested [38]. Regarding the association between independent variable X and mediating variable M, simple regression analysis shows that parental psychological control (X) can significantly influence the resilience (M), $F(1, 1389) = 41.83$, $p<.001$. The corresponding beta coefficient value was also significant, t =-6.47, $p<.001$, Beta value = .-19. Assessing the association of mediating variable (M) and dependent variable (Y), the simple regression analysis shows that the resilience factor (M) is also significantly associated with problematic internet use (Y), $F(1, 1389) = 54.20$, $p<.001$. The corresponding beta coefficient value was also significant, t = -10.11, $p<.001$, Beta value = -.244. Then both predictor and mediator variables were inserted in the model to predict the dependent variable. The multiple regression analysis indicated that overall model is significant, F(2, 1388) = 109.66, $p<.001$. Both variables parental psychological control and resilience were significant predictors. Table 6 show the results of regression analysis (see appendix).

The phenomenon supported the hypothesis. Moreover, to test the statistical significance of the mediation effect, Sobel test was performed suggested by Baron and Kenny[7]. The results of the Sobel test indicated that the indirect effect was statistically significant, Z= - 6.58, $p = .001$.

Table 6. *Results of examining mediation effect of resilience on problematic internet use.*

IV = Parental Psychological Control M = Resilience	DV = Problematic Internet Use Standardized Estimate Beta (β)
Total Effect of IV on DV without M (path a)	.302**
Direct Effect of IV on DV with M (path a')	-.182**
Indirect Effect of IV on DV through M (path	-.05**
Effect of IV on M (path b)	.262**
Effect of M on DV (path c)	-.171**
Mediation Path	IV □ M □ DV
Degree of Mediation	Partial
Hypothesis Result	Supported

*p< 0.05 , **p< 0.01, ***p< 0.001; the values in parentheses represents standard error

Resilience as a mediator between parental psychological control and depression.

Another mediation analysis was conducted to assess the mediating role of resilience in the relationship between parental psychological control and depression, as depict in following figure.

Figure 3 is based on the resilience as a Mediator between Parental psychological control and depression. Again, same four steps regression analysis were used to determine the prior condition of mediation analysis.

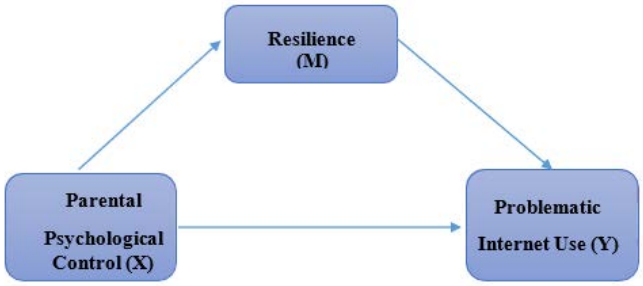

Figure 2. *Mediation Model-1.*

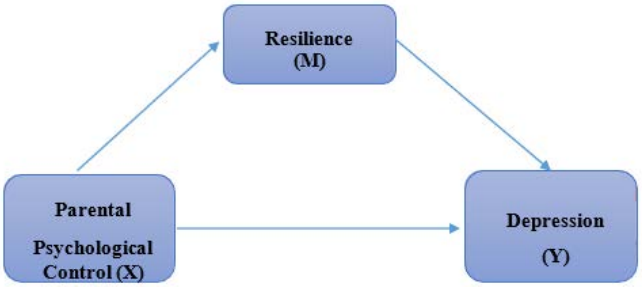

Figure 3. *Mediation Model-2.*

Table 7. *Results of examining mediation effect of resilience on depression.*

IV = Parental Psychological Control M = Resilience	DV = Depression Standardized Estimate Beta (β)
Total Effect of IV on DV without M (path a)	.405**
Direct Effect of IV on DV with M (path a')	.399**
Indirect Effect of IV on DV through M (path	.057**
Effect of IV on M (path b)	-.171**
Effect of M on DV (path c)	-.397**
Mediation Path	IV □ M □ DV
Degree of Mediation	Partial
Hypothesis Result	Supported

*p< 0.05 , **p< 0.01, ***p< 0.001; the values in parentheses represents standard error

In the model 2 (Figure 3) simple regression analysis shows that parental psychological control (X) has significant association with the resilience (M), F (1, 1389) = 26.69, $p<.001$. The corresponding beta coefficient value was also significant, b= -.154 (t=-6.4, p<.001). The next step is to assess the effect of mediating variable (M) on dependent variable (Y). The simple regression analysis shows that the resilience factor (M) is also significantly influence the depression variable (Y), F (1, 1389) = 259.15, p<.001. The corresponding beta coefficient value was

also significant, -.399 (t =-16.10, p<.001). In the last step, both predictor and mediator variables were included in the regression model to predict the dependent variable. The multiple regression analysis indicated that overall model is significant, F (2, 1388) = 262.54, p<.001. Both variables parental psychological control and resilience were significantly predicting depression.

Thus, above analysis demonstrated that there is mediation effect in the relationship between parental psychological control and depression. Sobel test was performed as suggested by Baron and Kenny [38]. The results of the Sobel test indicated that the indirect effect was statistically significant, Z= - 10.51, p = .001.

Discussion.

As we already have mentioned our first aim was to conduct an adaptation of CD-RISC-10 and to assess its psychometric properties. After obtaining permission we translated according to test adaptation guidelines. Then we conducted pretest with bilingual sample and conducted as well pilot study. We adjusted some small changes made by panel of experts and we conducted full scale study.

Our second aim was to explore the psychometric properties of CD-RISC-10, its reliability and validity. More specifically we investigated reliability through internal consistency, construct validity and model fit of our hypothesized model where association of problematic internet use(PIU) and depression with parental psychological control are mediated by resilience in Georgian students.

There is quite large number of studies with different sample where resilience scale demonstrates good psychometric qualities as a unidimensional tool [25,46,48-51].

We assessed reliability through internal consistency as in majority of the studies [25,30,46,48,49]. There have been conducted reliability studies on different countries and different samples. Most of them showed excellent reliability, our study demonstrated reliability of the scale on Georgian students – 0.87.

We assessed Content validity: it is estimated by testing the validity of the content of the instrument by rational analysis or through professional judgment.

Construct Validity: assesses the degree to which a measurement instrument assesses the intended construct or characteristic. As we already mentioned, there are two aspects of construct validity: convergent and divergent validity. Construct validity can be explained through AVE, factor loadings and model fit tests in CFA. Construct validity is considered achieved when factor loading is significant >0.6. Our study demonstrated average factor loading 0,63 [20,21,45,52].

Convergent validity.

PPC was negatively associated with resilience and resilience was negatively associated with PIU and depression(negative beta value). Which means higher scores of PPC Scale are associated with lower scores of Resilience and higher scores of Resilience are associated with lower scores of depressions and PIU [25]. As suggested resilience could act as protective factor in the face of risk of development of depression or problematic internet use in young internet users.

Conclusion.

Georgian version of Connor-Davidson Resilience Scale CD-RISC-10 demonstrated good reliability through assessing its internal consistency, construct validity through significant factor loading. One factor solution was confirmed. Overall, Model fit indices were all in acceptable range. The Georgian version of the CD-RISC-10 has acceptable psychometric properties as an instrument for measuring resilience in Georgian youth.

Limitations.

We need to interpret our results with caution for several reasons. First, the study was carried out on the students at Tbilisi State University which may limit the generalizability of the results of the study. Besides results of validity study can vary depending on hypothesis tested. Future studies may be carried out on a different age and cultural groups. Also, different measurement models should be tested.

Acknowledgements.

To all the participants in the study.

Statement of conflicting interests.

The authors declare that there is no conflict of interest.

Funding.

This study hasn't received any funding from the public, commercial, or non-profit agencies.

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