

French Versions of Two English Questionnaires on Problematic Digital Use Assessed by Adolescents and Their Parents: Cross-Cultural Linguistic Translation and Adaptation Study

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Submitted to: Interactive Journal of Medical Research
on: December 20, 2023

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French Versions of Two English Questionnaires on Problematic Digital Use Assessed by Adolescents and Their Parents: Cross-Cultural Linguistic Translation and Adaptation Study

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Abstract

Background: The emergence of problematic digital use (PDU) is increasingly alarming, affecting between 7% and 20% of the world's adolescent population. However, there is no validated questionnaire in French to measure this. Only a few questionnaires self-reported by adolescents or hetero-reported by parents have been translated and validated in English.

Objective: The aim of this study is to translate into French the Digital Addiction Scale for Children (DASC) self-reported by adolescents and the Problematic Media Use Measure (PMUM) hetero-reported by parents of adolescents.

Methods: We used the "forward/backward" method to establish the translation to achieve cross-cultural adaptation. There are three stages: (1) Initial translation and synthesis/reconciliation of the translations phase, (2) Back-translation and expert committee phase and (3) Pretesting phase with eight parents completed the PMUM questionnaire and eight adolescents completed the DASC questionnaire.

Results: During the translation phase, despite slight variations in translation for both questionnaires, the translators quickly reached a consensus. The expert committee did not propose any other conceptual changes. In the final phase, the parents made no comments to improve the questions or the wording. Although some adolescents mentioned repetition between certain questions, they did not suggest any improvements to the DASC questionnaire in French.

Conclusions: A questionnaire enabling adolescents to assess their own use of the drug (DASC) and another on parents' perceptions of their children's use (PMUM) will enable us to better detect or assess the prevalence of the PDU in French adolescent population.

(JMIR Preprints 20/12/2023:55685)

DOI: <https://doi.org/10.2196/preprints.55685>

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Original Manuscript

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Abstract

Background: The emergence of problematic digital use (PDU) is increasingly alarming, affecting between 7% and 20% of the world's adolescent population. However, there is no validated questionnaire in French to measure this. Only a few questionnaires self-reported by adolescents or hetero-reported by parents have been translated and validated in English.

Objective: This study aims to translate into French the Digital Addiction Scale for Children (DASC) self-reported by adolescents and the Problematic Media Use Measure (PMUM) hetero-reported by parents of adolescents.

Methods: We used the "forward/backward" method to establish the translation to achieve cross-cultural adaptation with eight parents and eight adolescents aged between 12 and 17 years. There are three stages: (1) Initial translation and synthesis/reconciliation of the translations phase, (2) Back-translation and expert committee phase, and (3) Pretesting phase, during which eight parents completed the PMUM questionnaire, and eight adolescents completed the DASC questionnaire.

Results: During the translation phase, despite slight variations in translation for both questionnaires, the translators quickly reached a consensus. The expert committee did not propose any other conceptual changes. In the final phase, the parents made no comments to improve the questions or the wording. Although some adolescents mentioned repetition between certain questions, they did not suggest any improvements to the DASC questionnaire in French.

Conclusions: Although the translated versions of the DASC and PMUM questionnaires provide

a foundation for detecting PDU, they require further validation studies to confirm their reliability and applicability in the French adolescent population.

Keywords: Internet Addiction; Screen Time; Questionnaires and Surveys; Translations; Adolescents

Introduction

Whilst the smartphone makes it easy to be entertained anywhere, the computer, tablet and video game console can also be a source of entertainment with negative impacts on health [1,2,3]. Meng et al [4] determined that 26% of the world's population have a problematic use of smartphones and 16% of social networks. Internet gaming disorder, recognized in the DSM-V [5] affects 6% of the population, rising to 22% of French adolescents [4].

Today, there is not a consensus for defining the digital addiction, but some researchers agree to say that, as a behavioral addiction, it is characterized by intensive use of all types of digital content with difficulty in self-regulation [4]. This implies a difficulty to be aware, to plan, to control its use and to evaluate its limits with regard to this use, both in time and in content [4;6]. We will refer to this as Problematic Digital Use (PDU). Among the consequences of the PDU, we find that major exposure to television or video games has deleterious effects on students' attitudes towards school and is even linked to poorer academic performance [7,8]. In addition, this type of use is known to be linked to a lower sleep quantity and sleep quality [9;10], more sedentary lifestyle [11], lower self-esteem and more anxio-depressive symptoms [12,10].

To estimate the prevalence of PDU, questionnaires are most often used in research, and some of them have already been validated in several countries and with several age profiles. To measure problematic smartphone use, we have identified three scales already validated in

French. The first is the Internet Addiction Test-smartphone [13] and is strongly inspired by the Internet Addiction Test (IAT) developed by Young [14]. The second scale, Smartphone Addiction Scale short version [15] comprises 10 items and is based on the six symptoms present in the DSM-V to assess internet gaming disorder [5] such as loss of control or disruption of family. A final scale, Problematic Mobile Phone Use Questionnaire (PMPUQ-SV) by Lopez-Fernandez et al. [16] measures the same problem with 15 items divided into three dimensions: dangerous use, forbidden use and dependent use of the smartphone. Three other questionnaires were translated and validated in French to assess problematic Internet use. The IAT [17] has been validated on medical students, the Compulsive Internet Use Scale (CIUS) [18] is intended for adults and the Generalized Problematic Internet Use Scale-2 (GPIUS2) [19] targets a general student population. Finally, the only questionnaire that measures problematic video game use in French is the Internet Gaming Disorder-20 [20] and has been validated with 20 items divided into 6 categories: salience, mood, tolerance, craving, conflict, and relapse.

To date, there exists no validated scale in French for quantifying digital addiction, and no measure has specifically addressed the adolescent population. However, adolescents are robust consumers of diverse digital content, perceiving them as a means to satisfy their autonomy needs, identity development, and to establish or maintain interpersonal connections [21;22]. While short-term benefits are highly valued by young people, the costs of intensive use are significant, leading to more risky behaviors, lower self-esteem, depressive symptoms, and suicidal ideation [23;24]. The DPDU can significantly alter the development of adolescents by causing neuronal dysfunctions in subcortical, frontal, and parietal areas involved in attention and behavioral control [21].

To measure PDU in adolescents, the English scale by Hawi et al. [25], the Digital Addiction Scale for Children (DASC), is a promising tool. The scale is based on the nine criteria recognized for

diagnosing Internet gaming disorder in the DSM-V. An existing alternative or complementary solution involves asking parents to assess their adolescents' PDU. Domoff et al. [26] proposed a questionnaire in two versions: the final versions of the Problematic Media Use Measure (PMUM, 27 items) and the Problematic Media Use Measure Short Form (PMUM-SF, 9 items). The PMUM has been validated in English and also considers the nine criteria of the DSM-V for Internet gaming disorder. Although translated into English and Arabic, it has never been translated into French.

Whereas most questionnaires measure specific device use (e.g., smartphone) [13, 15, 16], this study aims to better measure PDU in the French adolescent population by linguistically translating two questionnaires: the DASC, administered to adolescents, and the PMUM, administered to parents of adolescents. The translation process was carried out using the "forward/backward" method.

Methods

Ethics Approval

This study was approved by the Grenoble Alpes University Hospital Center and has received ethics approval from the South-East I Ethics Committee for the Protection of Individuals (approval 2022-A01943-40). The collected data were anonymized throughout the analysis process, in compliance with the MR003 methodology approved by the CNIL. For minor participants, consent to participate was obtained by the teenagers and their parent. Adult participants gave their own consent. Furthermore, no compensation was provided to the participants.

Cross-cultural adaptation procedure with “forward/backward” method

We assessed the conceptual equivalence of the two questionnaires following the

recommendations of Epstein et al. [27] and used the most commonly adopted technique for cross-cultural research: the “forward/backward” method. Conceptual equivalence—evaluating whether items in the original language have a similar meaning in French—was emphasized by systematically analyzing item, semantic, idiomatic, operational, and experiential equivalence [28].

The forward/backward method is divided into three main phases of analysis which we describe below.

Initial translation and Synthesis/reconciliation of the translations phase

We recruited four independent translators who are native French speakers and bilingual in English to translate the original French version. Two of the translators were familiar with the concept of PDU in their professional activities, while the other two did not work with this concept. Out of the four translations, the translators reconciled their differences to produce a single unified version.

Back-translation and expert committee phase

The French version was back-translated into English by a native English speaker to verify the accuracy of the translation and highlight any confusing wording. Then, two expert researchers familiar with the concept of PDU evaluated the equivalence of the questionnaire by comparing the back-translated version with the original version. They proposed modifications to the items in French if necessary.

Pretesting phase

We carried out a preliminary pilot study with adolescent participants and parents to assess the clarity, intelligibility and acceptability of the French translations. The sampling was conducted using a convenience method through calls for participation in schools and libraries. A call for participation was shared during conference activities that we led about digital addiction. Participant criteria were specified in order to select specific settings such as age and region.

They responded to the call if they agreed to participate. Between December 2022 and June 2023, eight parents completed the PMUM questionnaire and eight adolescents aged between 12 and 17 years completed the DASC questionnaire. Accompanied by a student observer who cross-checked information to minimize interpretation biases, the principal researcher spoke with the participants, who gave their opinions on the questionnaires and assessed whether the questions were relevant to their age group. In order to categorize participants' feedback, we conducted a qualitative thematic analysis by manually coding their comments into four categories: (1) linguistic incomprehension, (2) linguistic ambiguity, (3) suggestions for modification, and (4) redundancies.

The protocol consisted of an individual interview with each participant, who completed the questionnaire(s). Each interview lasted a maximum of 30 minutes.

Instruments

Digital Addiction Scale for Children (DASC) designed by Hawi and colleagues [25] is composed of 25 statements distributed across nine dimensions taken from the DSM-V video game addictive disorder criteria [5]: preoccupation in daily life, tolerance, withdrawal symptoms, mood changes, social and psychological consequences, relapses, physiological problems, deception regarding its use and family disconnection. In the absence of the original online guideline that introduces the questionnaire to the participants, we took inspiration from the PMUM scale [26] by specifying that we want to capture adolescents' experiences with their screens (i.e., television, video games, tablets, smartphones, portable game consoles, laptops, computers). The adolescent must reflect on his experiences over the past year. The response scale ranges from 1 (never) to 5 (always) and the total score can vary from 25 to 125.

Problematic Media Use Measure (PMUM) is composed of 27 statements and was designed by Domoff and colleagues [26] who based the instrument on the diagnostic criteria for online gaming addiction disorder in the DSM-V [5]. The guideline consists of asking parents how their

child uses screens (i.e., television, video games, tablets, smartphones, portable game consoles, laptops, computers). For each statement, they select the option that is true for their child during the last year. For each question, the response scale is from 1-never to 5-always, the total average score on this scale can vary from 1 to 5.

Data Analysis

Data were analyzed using a qualitative approach with the forward/backward method, involving iterative interpretation of the interview responses. Descriptive statistics were conducted on the sample characteristics, such as age and gender. The qualitative analysis focused on identifying four key themes from the interviews.

Results

Characteristics of the Translators and the Participants

The age, gender, and specific cultural characteristics of the translators, the parent and adolescent participants are detailed in [Table 1](#).

Table 1. Age, gender, and cultural characteristics of the translators and the participants.

N		Mean Age	Gender	Cultural characteristics
Forward translation:				
	4 translators	25.5 (min: 20; max: 31)	2 females; 2 males	2 native English, 2 native French 2 were familiar with the concept of problematic smartphone use (eHealth and psychology); 2 were not familiar with the concept (economics and education) 2 were from the south of France and 2 from the north.
Backward translation:				
	1 translator	28	1 female	Native English No clinical or medical expertise
Linguistic verification:				
	2 experts	27.5 (min: 24;	1 female; 1 male	2 Native French

		max: 31)		
Final verification:				
	8 parents	43.1 (min: 40; max: 48)	4 females; 4 males	Good health and not experiencing any severe medical condition 2 from rural areas and 6 from urban areas in France
	8 adolescents	13.8 (min: 12; max: 17)	6 girls; 2 boys	Good health or suffering from any medical condition 3 from rural areas and 5 from urban areas in France 6 from middle school and 2 from high school

Forward translation

Four translators translated the titles, dimensions, guidelines, response categories and statements of the two questionnaires. The four proposals were grouped together to arrive at a consensual version. Although the titles, response categories and guidelines did not pose a translation problem, there was less consensus on some dimension names. This mainly concerns the ‘withdrawal’ dimension present in the two questionnaires, which has ultimately been translated as “sevrage”. The second, more problematic dimension to translate was that of the DASC scale: “displacement”. In the context of behavioral addiction, displacement corresponds to the implementation of intense or compulsive displacement behaviors when an individual is in a stressful situation [29]. We opted for the “déplacement” term that is adapted and used in French [30]. Similarly, for the DASC scale, although “device” is generally translated in French as “appareil” we opted for “écrans” to better suit the context. For item 15, “enjoyable” offered multiple translation options, we translated it as “amusant” in order to adapt to our context. For item 20, “I check my device [...]” had four different translations among the four translators as “to check” has a wide range of relevant translations. Therefore, we decided to translate it as “verifier” even though it is not the most common word among all translation options, but as it is the most close translation from the original sentence without impacting the overall item meaning and conveying an intentional and repeating action. For item 25, “grades”

was translated by “notes scolaires” as the raw translation “notes” would add too much ambiguity on the overall item.

For the PMUM questionnaire items, 23 of them were very similar between the four translations. Four items varied slightly for one or two translators. For instance, for item 10, the term “enjoys” offered multiple translation options; to achieve both semantic and idiomatic equivalence, we chose “apprécier”, resulting in: “Il n’y a rien que mon enfant n’apprécie autant que les écrans.” In two items, the term “amount of time” lacks a direct French equivalent. To preserve the operational and semantic meaning, we chose “la quantité de temps” for item 13, and “des périodes de plus en plus longues” for item 14. In item 22, the ambiguous term “sneaks” was resolved as “en cachette.”

As for the DASC questionnaire items, 22 reached consensus and three items varied slightly for one or two translators. Although “device” is typically rendered as “appareil,” we selected “écrans” for better contextual equivalence. For item 15, to capture the intended semantic nuance of “enjoyable,” we chose “amusant.” In item 20, given the wide semantic range of “to check,” we opted for “vérifier” to best preserve the original meaning and indicate a repeated action. Finally, for item 25, “grades” was translated as “notes scolaires” to avoid ambiguity and ensure semantic clarity.

Backward translation and linguistic verification

After the questionnaires were translated from the consensus version into English by the native English translator, we observed that all 21 out of 27 items of the PMUM questionnaire and all 25 items of the DASC questionnaire were accurately retranslated into English. For the PMUM, some formulations or terms varied but did not modify the meaning of the items. One item’s semantic meaning was strongly altered during the backtranslation: “My child attempts to use screen media for increasing amounts of time.” was retranslated as “My child keeps using screens for longer periods.” At the semantic level, this backtranslation does not reflect the

intention of using the screen more and more – as covered by the initial item. Consequently, we modified the French item translation in order to better capture the original meaning of the item.

After these modifications, two researchers reread the latest French translation during a final professional translation step. No suggestions or conceptual modifications were proposed for the two questionnaires.

Final verification

The final version of the PMUM and DASC questionnaires were delivered to adolescents and parents in the pilot study. The eight parents had no comments for improvement for any of the items or the statements, including linguistic incomprehension, linguistic ambiguity, suggestion for modification, or redundancies.

Although some adolescents noted repetitive phrasing (redundancies) across items addressing withdrawal symptoms—for example, items 12 and 21 use "frustrated" while items 3 and 8 use "upset", reflecting potential linguistic ambiguity—the expert team determined that these repetitions were essential for capturing subtle distinctions in behavior and experience, ensuring a comprehensive assessment of the construct, even if the phrasing occasionally feels redundant to adolescents, because “frustrated” and “upset” have close semantic meaning in French. No linguistic incomprehension was reported at this stage, and these feedbacks did not lead to suggestions for modification of the 25 items of the DASC questionnaire. The final translated versions are listed in Tables 2 and 3.

Table 2. Digital Addiction Scale for Children (DASC) translation.

		1 ^a	2 ^b	3 ^c	4 ^d	5 ^e
[1]	ET: When I am not at school, I spend a lot of time using my device. FT: Quand je ne suis pas à l'école, je passe beaucoup de temps à utiliser mes écrans.					
[2]	ET: I feel the need to spend more time using my device. FT: Je ressens le besoin de passer plus de temps à utiliser mes écrans.					
[3]	ET: I feel upset when I am not able to use my device.					

	FT: Je me sens contrarié.e quand je ne peux pas utiliser mes écrans..					
[4]	ET: I lie to my parents about the amount of time I spend using my device. FT: Je mens à mes parents à propos du temps que je passe à utiliser mes écrans.					
[5]	ET: Using my device helps me to forget my problems. FT: Utiliser mes écrans m'aide à oublier mes problèmes.					
[6]	ET: I do not spend time with my family members because I prefer using my device. FT: Je ne passe pas de temps avec les membres de ma famille parce que je préfère utiliser mes écrans.					
[7]	ET: I have spent more and more time on my device. FT: Je passe de plus en plus de temps sur mes écrans.					
[8]	ET: I feel upset when I am asked to stop using my device. FT: Je me sens contrarié.e lorsque l'on me demande d'arrêter d'utiliser mes écrans.					
[9]	ET: My parents try to stop or limit me using my device, but they fail. FT: Mes parents essaient de m'arrêter ou me limiter dans l'utilisation de mes écrans, mais ils échouent.					
[10]	ET: I am sleeping less because I am using my device. FT: Je dors moins parce que j'utilise mes écrans.					
[11]	ET: When I do not have my device, I think about what I do on it (video games, social media, and texting, etc.). FT: Quand je n'ai pas mes écrans, je pense à ce que je fais dessus (jeux vidéo, réseaux sociaux, messagerie, etc.).					
[12]	ET: I feel frustrated when I cannot use my device. FT: Je me sens frustré.e quand je ne peux pas utiliser mes écrans.					
[13]	ET: I have problems with my parents about the amount of time I spend using my device. FT: J'ai des problèmes avec mes parents à propos du temps que je passe à utiliser mes écrans.					
[14]	ET: Using my device is the most important thing in my life. FT: Utiliser mes écrans est la chose la plus importante dans ma vie.					
[15]	ET: Using my device is more enjoyable than doing other things. FT: Utiliser mes écrans est plus amusant que de faire d'autres choses.					
[16]	ET: I lie to my parents about what I do on my device. FT: Je mens à mes parents à propos de ce que je fais sur mes écrans.					
[17]	ET: I am not able to control using my device. FT: Je ne suis pas capable de contrôler mon utilisation des écrans.					
[18]	ET: I have lost interest in hobbies or other activities because I prefer using my device. FT: J'ai perdu de l'intérêt dans les loisirs ou autres activités parce que je préfère utiliser mes écrans.					
[19]	ET: When I stop using my device, it is not long before I start using it again. FT: Quand j'arrête d'utiliser mes écrans, il s'écoule peu de temps avant que je les utilise de nouveau.					
[20]	ET: I check my device when I am doing homework or other important things. FT: Je vérifie mes écrans quand je fais mes devoirs ou d'autres choses importantes.					
[21]	ET: I feel frustrated when I am asked to stop using my device. FT: Je me sens frustré.e quand on me demande d'arrêter d'utiliser mes écrans.					
[22]	ET: I argue with my parents when they ask me to stop using my device. FT: Je me dispute avec mes parents quand ils me demandent d'arrêter d'utiliser mes écrans.					
[23]	ET: I spend too much money on things for my device. FT: Je dépense beaucoup trop d'argent pour des choses pour mes écrans.					
[24]	ET: Using my device makes me feel better when I feel bad. FT: Utiliser mes écrans me fait sentir mieux quand je me sens mal.					
[25]	ET: I continue using my device despite the fact that my grades at school are getting lower and lower. FT: Je continue d'utiliser mes écrans malgré le fait que mes notes scolaires					

deviennent de plus en plus basses.

^a English Translation (ET): Never -> French Translation (FT): Jamais

^b English Translation (ET): Rarely -> French Translation (FT): Rarement

^c English Translation (ET): Sometimes -> French Translation (FT): Parfois

^d English Translation (ET): Often -> French Translation (FT): Souvent

^e English Translation (ET): Always -> French Translation (FT): Toujours

Table 3. Problematic Media Use Measure (PMUM) translation.

		1 ^a	2	3	4	5 ^b
[1]	ET: It is hard for my child to stop using screen media. FT: C'est dur pour mon enfant d'arrêter d'utiliser les écrans.					
[2]	ET: It is increasingly difficult to pull my child away from screen media. FT: C'est de plus en plus difficile de tenir mon enfant éloigné des écrans.					
[3]	ET: It is really difficult to get my child to stop using screen media. FT: C'est très difficile de faire arrêter mon enfant d'utiliser les écrans.					
[4]	ET: Screen media is the only thing that seems to motivate my child. FT: Les écrans sont la seule chose qui semblent motiver mon enfant.					
[5]	ET: My child is always thinking about using screen media. FT: Mon enfant est toujours en train de penser à utiliser les écrans.					
[6]	ET: Screen media is all that my child seems to think about. FT: Les écrans sont la seule chose à laquelle mon enfant sembler penser.					
[7]	ET: My child becomes frustrated when he/she cannot use screen media. FT: Mon enfant devient frustré lorsqu'il/elle ne peut pas utiliser les écrans.					
[8]	ET: My child's screen media use interferes with family activities. FT: L'utilisation des écrans de mon enfant interfère avec les activités familiales.					
[9]	ET: My child gets upset when he/she cannot use screen media. FT: Mon enfant devient contrarié lorsqu'il/elle ne peut pas utiliser les écrans.					
[10]	ET: There is nothing my child enjoys as much as screen media. FT: Il n'y a rien que mon enfant n'apprécie autant que les écrans.					
[11]	ET: My child becomes angry when he/she cannot use screen media. FT: Mon enfant devient en colère lorsqu'il/elle ne peut pas utiliser les écrans.					
[12]	ET: My child's screen media use causes problems for the family. FT: L'utilisation des écrans de mon enfant cause des problèmes pour la famille.					
[13]	ET: The amount of time my child wants to use screen media keeps increasing. FT: La quantité de temps que veut passer mon enfant sur les écrans continue sans cesse d'augmenter.					
[14]	ET: My child attempts to use screen media for increasing amounts of time. FT: Mon enfant utilise les écrans pendant des périodes de plus en plus longues.					
[15]	ET: Problems occur for our family when my child cannot use screen media. FT: Des problèmes surviennent dans notre famille lorsque mon enfant ne peut pas utiliser les écrans.					
[16]	ET: My child would find life boring without screen media. FT: Mon enfant trouverait la vie ennuyante sans les écrans.					
[17]	ET: Life would be easier if my child was not so attached to screen media. FT: La vie serait plus facile si mon enfant n'était pas aussi attaché aux écrans.					
[18]	ET: The first thing my child asks to do when he/she comes home from school is to use screen media. FT: La première chose que mon enfant demande à faire lorsqu'il/elle revient de l'école est d'utiliser les écrans.					
[19]	ET: My child's screen media use negatively affects his/her friendships. FT: L'utilisation des écrans de mon enfant affecte négativement ses relations amicales.					
[20]	ET: My child uses screen media for increasing amounts of time. FT: Mon enfant passe de plus en plus de temps sur les écrans.					
[21]	ET: My child loses sleep due to screen media use.					

	FT: Mon enfant perd le sommeil à cause de son utilisation des écrans.					
[22]	ET: My child sneaks using screen media. FT: Mon enfant utilise les écrans en cachette.					
[23]	ET: My child lies about doing chores or school work in order to use screen media. FT: Mon enfant ment à propos des tâches de la maison ou du travail scolaire afin d'utiliser les écrans.					
[24]	ET: When my child has had a bad day, screen media seems to be the only thing that helps him/her feel better. FT: Quand mon enfant a eu une mauvaise journée, les écrans semblent être la seule chose qui l'aide à se sentir mieux.					
[25]	ET: My child feels better when he/she uses screen media. FT: Mon enfant se sent mieux lorsqu'il/elle utilise les écrans.					
[26]	ET: My child uses screen media to feel better. FT: Mon enfant utilise les écrans pour se sentir mieux.					
[27]	ET: My child lies in order to use screen media. FT: Mon enfant ment afin d'utiliser les écrans.					

^a English Translation (ET): Never -> French Translation (FT): Jamais

^b English Translation (ET): Always -> French Translation (FT): Toujours

Discussion

We effectively conducted a cross-cultural adaptation of two original questionnaires into French to measure PDU among adolescents. These questionnaires are intended to be filled by adolescents themselves (DASC) or by their parents (PMUM). Although the DASC and PMUM were originally validated in children aged 9–12 and 4–11, we applied these instruments to adolescents aged 12–17. One of the advantages of considering these two questionnaires is that, given that PDU in adolescents may manifest as extreme resistance to limits imposed by parents, leading to significant intra-familial conflicts, questioning parents in addition to adolescents provides valuable information to better understand the extent of PDU. In order to make these questionnaires accessible in French, we translated them from English using the forward/backward method by following the three stages of translation of the method recommended by Esptein [27] and that has already been used for prior related French translations [31]. The conceptual equivalence of the French questionnaires was close to that of the English questionnaires. Regarding our results, neither parents nor adolescents encountered major difficulties in understanding the items, and experts recognized that the final

translations were equivalent to the original questionnaires. Limitations include the small sample size - although the minimum number of participants for linguistic validation is not clearly defined [28] - and the lack of validation. Further studies are required to validate these translations in larger populations and confirm their psychometric properties, particularly since adolescents reported that some items of the DASC were redundant. Although other cross-cultural adaptations studies incorporated additional steps, such as confirmatory and exploratory factor analyses, to examine the instrument's internal structure and reliability in a simulated clinical setting [32, 33, 34], the present study did not include these analyses. Yet, as the DASC aims to assess PDU, a construct that is not directly observable and is composed of multiple dimensions such as tolerance, withdrawal symptoms, overuse or physical and psychological consequences, future research should further investigate its structure validity. Additionally, researchers will need to assess the convergent validity of the questionnaires by showing that the scores obtained from the two translated questionnaires are positively correlated with other similar or closely related measures. These questionnaires can also be supplemented by objective and passive measurements derived directly from digital tools [35]. The last step will consist of evaluating the reliability of the questionnaires with regard to their consistency and stability with longitudinal test-retest analyses.

These questionnaires validated in French will be useful in research to make intercultural comparisons in PDU demographics. In addition, they can be used for professional purposes as part of medical or psychological care to detect PDU among adolescents.

Conclusion

This study enabled the effective cross-cultural adaptation into French of two questionnaires on PDU of adolescents.

This study revealed that parents and adolescents easily understood the items, and experts confirmed the final translations' equivalence with the originals. Once the stage of validation of

the questionnaires in French will be completed, these two questionnaires can be used in French-speaking regions to screen or measure PDU among adolescent populations. Limitations of this research include the small sample size and the lack of psychometric validation, which are necessary to establish the reliability and validity of the translated questionnaires.

This study provides questionnaire enabling adolescents to assess their own digital addiction (DASC) and another on parents' perceptions of their children's use (PMUM) will enable research community to better detect or assess the prevalence of the PDU in French adolescent population.

Acknowledgements

This study would not have been possible without the support of Université Grenoble Alpes, Grenoble Alpes University Hospital Center, and LINKSIUM (Society of Technology Transfer and Startup, Grenoble Alpes). This work was partially funded by MIAI Cluster (ANR-23-IACL-0006) and the French National Research Agency (Agence Nationale de la Recherche) within the framework of the "Investissements d'avenir" program (ANR-10-AIRT-05, 2012; ANR-15-IDEX-02, 2016). The funders played no role in the study design, data collection, analysis and interpretation of data, or writing of this manuscript. We used OpenAI's generative AI tool, ChatGPT, to perform semantic reformulations to improve the overall quality of the English and to better understand the reviewers' expectations during the peer review process [36]. The original ChatGPT transcripts are provided as a Appendix.

Authors contribution

IEB collected data, reviewed and assessed the results, wrote the original draft, wrote and reviewed the revised version of the manuscript, and acquired funding. MR collected analyzed and interpreted data, wrote the original draft, wrote and reviewed the revised version of the

manuscript, and acquired funding. AB conceptualized and designed the study, reviewed and assessed the results, wrote and reviewed the revised version of the manuscript. NV conceptualized and designed the study, supervised the project, reviewed and assessed the results, wrote and reviewed the revised version of the manuscript and acquired funding. All authors reviewed and agreed to the published version of the manuscript.

Conflict of interest

None declared.

Data availability statement

The qualitative interview data supporting the findings of this study are not publicly available due to confidentiality considerations. However, they will be made available upon reasonable request. Interested researchers may contact the corresponding author to discuss access arrangements.

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Supplementary Files

Multimedia Appendixes

Chat-GPT Conversation History.

URL: <http://asset.jmir.pub/assets/d2d30cdf9b001f94489481b1eb7931eb.xlsx>