

# Prevalence of grooming and sexting among Portuguese youth: Adaptation of the Questionnaire for Online Sexual Solicitation and Interactions with Adults and Sexting Questionnaire

Telma Catarina Almeida<sup>a,\*</sup>, André Pereira<sup>b</sup>

<sup>a</sup> Egas Moniz School of Health & Science, Center for Interdisciplinary Research Egas Moniz (CiEM), 2829-511 Caparica, Almada, Portugal

<sup>b</sup> Egas Moniz School of Health & Science, 2829-511 Caparica, Almada, Portugal

## ARTICLE INFO

### Keywords:

Online grooming  
Sexting  
Instruments  
Portuguese youth

## ABSTRACT

**Background:** Online grooming is a type of victimization that is related to sexting behaviors and hurts youth. Research shows a high prevalence of online grooming victimization and sexting behaviors.

**Objectives:** This study aims to analyze the Portuguese version of the Questionnaire for Online Sexual Solicitation and Interactions with Adults (QOSSIA) and Sexting Questionnaire (SQ) factor structure and psychometric properties; assess the relationship between the QOSSIA and sexting, sexual victimization, and positive emotions; and to assess the prevalence of online grooming victimization and sexting among Portuguese youth.

**Methods:** The sample comprised 172 adolescents between 12 and 17 years old ( $M = 15.84$ ,  $SD = 1.13$ ), of which 101 were girls (58.7 %) and 71 were boys (41.3 %).

**Results:** QOSSIA and SQ show good internal consistency and an adequate model fit. Positive correlations were identified between QOSSIA, sexting, and sexual victimization. Negative correlations were identified between QOSSIA and positive emotions. Seventy-two youths reported at least one online grooming solicitation during the past year.

**Conclusions:** This is the first Portuguese version of the QOSSIA and SQ. The QOSSIA and the SQ allow the assessment of online grooming and sexting, contributing to identifying youth victimization and developing multicultural research. According to our study, the prevalence of online grooming victimization and sexting behaviors among Portuguese youth is high. These findings highlight the importance of assessing and addressing these issues in youth interventions.

## 1. Introduction

Online grooming is a process in which the adult manipulates the minor through the internet, intending to abuse them sexually (Branca et al., 2016; Chiu & Quayle, 2022). This process involves a complex psychological manipulation that can last from days to years (De Santisteban & Gámez-Guadix, 2018; Wachs et al., 2018) depending on the type of relationship established, taking into consideration the adult's goals towards the minor and the latter's reactions and needs (Webster et al., 2012). The online grooming process can be divided into two phases: online solicitations and online interactions (e.g., De Santisteban & Gámez-Guadix, 2018). Online sexual solicitation can include, among other things, asking for information about previous sexual experiences (Van Gijn-Grosvenor & Lamb, 2016) and asking for sexual images and/

or videos (Quayle & Newman, 2016). Many youths respond to online sexual solicitations with active behaviors of interacting with the perpetrator, in which the adult sexually abuses the minor, either online (e.g., by obtaining sexual materials such as photos of the minor or through a webcam) or in offline encounters in which there may be sexual involvement (De Santisteban & Gámez-Guadix, 2018; Wachs et al., 2012).

Grooming behaviors may be explained by the Ward and Siebert Model (2002), which describes the dysfunction of the perpetrator in terms of emotional regulation, cognitive distortions, intimacy deficits, and deviant sexual arousal patterns. Child molesters commonly show dysfunctional mechanisms in those areas, and when these dysfunctional mechanisms co-occur with sexual needs, sexual offense arises. The opportunity to offend also plays a critical role in the sexual offense, and

\* Corresponding author at: Egas Moniz School of Health & Science, Center for Interdisciplinary Research Egas Moniz, 2829-511 Caparica, Almada, Portugal.  
E-mail address: [telma.c.almeida@gmail.com](mailto:telma.c.almeida@gmail.com) (T.C. Almeida).

grooming is the process to create such opportunities (Ward & Siegert, 2002).

Empirical studies suggest an association between online grooming and sexting (Gassó et al., 2019; Schoeps et al., 2020). Some studies explain this association, revealing a bidirectional relationship between sexting and online grooming (Gámez-Guadix & Mateos-Pérez, 2019). Sexting is common among youth (Gámez-Guadix et al., 2017). Sexting involves sharing erotic or sexual content online and is a type of intimate communication prevalent in today's digital community (Ojeda et al., 2024). Research identifies benefits for adolescents' well-being when using sexting (e.g., when the sexting is adaptive and consensual) or adverse outcomes (e.g., when there is non-consensual sexting or when the sexting is between a minor and an adult) (Lebedíková et al., 2024). The practice of sexting is related to a higher probability of the young person suffering victimization by online grooming (Resett, 2021). On the other hand, online grooming may be related to the initiation of voluntary sexting behaviors by youth (Gámez-Guadix & Mateos-Pérez, 2019).

In this study, we consider the definition of sexting as the creation and sending of messages, photos, and/or videos with personal sexual content voluntarily through the internet or cell phone (e.g., Gámez-Guadix et al., 2017; Mitchell et al., 2012).

### 1.1. Online grooming and sexting prevalence and impact

The literature indicates that online sexual solicitations and adult interactions affect many young people. The available prevalence data for this phenomenon is concerning (Ortega-Barón et al., 2022). However, prevalence tends to vary between studies because of the diversity of assessment instruments, criteria, and ways of conceptualizing online youth sexual abuse (Madigan et al., 2018; Quayle et al., 2016). Beyond this, there are more studies of sexual solicitations than online sexual interactions (Gámez-Guadix et al., 2021). A study conducted in the United States of America, with a sample consisting of youth between the ages of 10 and 17, revealed a prevalence of online sexual solicitations of 2 % in the youth of 10 to 12 years old and 14 % in the youth of 17 years old (Jones et al., 2012). A study conducted in Germany (Wachs et al., 2012) reported a prevalence of 21 %. The study by Wachs et al. (2016) with a sample from different countries – Germany, the Netherlands, the United States of America, and Thailand – reported a prevalence of 18.5 %. Another study set in the United States of America (Greene-Colozzi et al., 2020) indicated a prevalence of 23 %. In Spain, the prevalence was 12.6 % for online sexual solicitations and 7.9 % for online sexual interactions (De Santisteban & Gámez-Guadix, 2018). Longitudinal studies have indicated increasing online grooming victimization over time (Gámez-Guadix & Mateos-Pérez, 2019; Ortega-Barón et al., 2022). In Portugal, a study by Branca et al. (2016) found that 20.5 % of minors reported at least one experience of online grooming victimization.

Like online grooming, the prevalence of sexting behaviors has varied over the last few years due to the diversity of variables and assessment methods (Penado et al., 2019). European studies have revealed a prevalence of between 9.6 % and 35.6 % of sexting by young people (Mitchell et al., 2012; Molla-Esparza et al., 2021; Quesada et al., 2018). A study conducted in the UK, with a sample of young people aged 10 to 17, found that 9.6 % reported ever sending sexual content in which they appeared (Mitchell et al., 2012). In Spain, a study indicated a prevalence of 24 % in youth aged 12 to 18 years (Molla-Esparza et al., 2021). A meta-analysis developed by Madigan et al. (2018) found a mean of 20.3 % for online exposure to sexually explicit material and 11.5 % for unwanted online sexual solicitations to youth under the age of 18. Finally, a longitudinal study developed by Gámez-Guadix and Mateos-Pérez (2019) provided insight into the increase, over time, of the prevalence of sexting behaviors in Spanish youth aged 12 to 14 years. The prevalence at the first study time point was 7.6 %, increasing to 17.5 % the following year (Gámez-Guadix & Mateos-Pérez, 2019).

Several studies suggest that a history of childhood sexual abuse is a

risk factor for future online victimization (e.g., Helweg-Larsen et al., 2011), namely by online grooming (Widuger, 2015). Youth who reported experiencing sexual abuse in the past also reported more victimization by online grooming (Widuger et al., 2015). Regarding sexting, some studies have also linked sexual abuse to a greater likelihood of engaging in sexting, particularly among girls (Titchen et al., 2019). Furthermore, online grooming victimization has been associated with several negative emotions and feelings, namely depressive symptoms and anxiety (Gámez-Guadix et al., 2021), stress and irritability (Wolak et al., 2006). Sexting has been linked with depressive symptoms (Frankel et al., 2018), anxiety (Klettke et al., 2019), stress (Klettke et al., 2018), shame and fear (Mitchell et al., 2012).

### 1.2. Gender and age differences: Online grooming and sexting

Some studies have indicated that older youth, ages 14 to 17, are more likely to be victimized by online grooming than younger youth (Sklenarova et al., 2018). Regarding gender differences, most studies indicate that females may be more predisposed to online grooming victimization (De Santisteban & Gámez-Guadix, 2018; Sklenarova et al., 2018). A Spanish study found that 15.6 % of girls and 9.3 % of boys reported at least one sexual solicitation, and 8.2 % of girls and 7.4 % of boys reported sexual interactions with adults (De Santisteban & Gámez-Guadix, 2017).

Regarding sexting, most studies indicate that the prevalence of sexting behaviors increases with age (Gámez-Guadix & Mateos-Pérez, 2019; Mitchell et al., 2012). A study conducted in Spain shows that the practice of sexting behaviors tends to increase during adolescence, with a prevalence of 3 % at age 12 and 36 % at age 17 (Gámez-Guadix et al., 2017). Quesada et al.'s (2018) study corroborates those results, concluding that youth aged 16 to 18 years practice more sexting (45.9 %) compared to youth aged 14 to 15 years (28.1 %). Most studies have found no sex differences in sexting (e.g., Gámez-Guadix et al., 2017; Gámez-Guadix & Mateos-Pérez, 2019; Quesada et al., 2018; Temple et al., 2012). However, some of them indicate that girls practice more sexting than boys (Gewirtz-Meydan et al., 2018; Mitchell et al., 2012), although others report a higher prevalence of this practice by boys (e.g., Ojeda et al., 2020).

### 1.3. Online grooming assessment

Although the importance of assessing online grooming is recognized (e.g., Madigan et al., 2018), only some validated instruments with adequate psychometric properties to assess it hinder a better understanding of the phenomenon. Most international (Greene-Colozzi et al., 2020; Jones et al., 2012; Sklenarova et al., 2018; Wolak et al., 2006) and national ones (Branca et al., 2016) that assess online grooming victimization do not use validated instruments opting for the creation of questionnaires to assess the phenomenon, in which their psychometric properties are not identified.

Recently, validated instruments have already been used in Spain to assess online grooming victimization (Calvete et al., 2022; De Santisteban & Gámez-Guadix, 2018; Ortega-Barón et al., 2022; Schoeps et al., 2020). One such instrument is the "Juvenile Online Victimization Questionnaire – JOV-Q" by Montiel et al. (2012), consisting of 373 items to assess online victimization among youth aged 12 to 20. Despite allowing for an extensive collection of information about several types of online victimization and presenting good psychometric properties, this questionnaire proves to be extensive, given the age of the population assessed. In addition, the instrument is limited to assessing online sexual solicitations, not considering the possible "interactive relationship that the minor establishes with the adult". Another instrument used is "The Grooming Scale" (Hernández & Mateo, 2018), which is composed of 13 items that assess online grooming in its general dimension. However, it has the limitation that it does not allow us to understand whether online sexual solicitation has escalated to the offline world, namely by

scheduling personal encounters between the adult and the young person. Later, an instrument developed by Gámez-Guadix et al. (2018), the “Questionnaire for Online Sexual Solicitation and Interactions with Adults” (QOSSIA), sought to address these limitations by considering both solicitations and online sexual interactions to quantify the phenomenon (Gámez-Guadix et al., 2018). This questionnaire has been used by most studies on online grooming victimization (e.g., Calvete et al., 2022; De Santisteban & Gámez-Guadix, 2017; Ortega-Barón et al., 2022; Resett, 2021), showing good psychometric properties and good factorial and convergent validity (Gámez-Guadix et al., 2018).

Despite the instruments above, no validated measure exists to assess online grooming in Portugal. Therefore, adapting to the Portuguese population, an instrument that contributes to a greater and better understanding of online grooming in the Portuguese context becomes pertinent. Comparing the few internationally validated instruments mentioned above (Gámez-Guadix et al., 2018; Montiel et al. 2012; Hernández & Mateo, 2018), the QOSSIA by Gámez-Guadix et al. (2018) is the one that best assesses the phenomenon. That measure was created to assess the prevalence of online grooming victimization over the past year through two dimensions with five items each. The first dimension concerns sexual solicitation (e.g., “An adult has asked me to send him pictures or videos of me with intimate or sexual content via the internet or computer.”) and the second assesses sexual interactions (e.g., “I have sent photos or videos of me with sexual content to an adult.”). The response to each item is given on a 4-point Likert scale, with response options ranging from 0 (never) to 3 (six times or more), and the total score for each dimension ranges from 0 to 15. Additionally, minors are asked how many people over 18 these behaviors happened with (with none, with one person, with two or three people, with four or five people, or with six or more people). The instrument revealed good psychometric properties, with Chronbach’s scores of 0.87 for the total scale and 0.69 for the sexual solicitation and sexual interaction subscale, respectively (Gámez-Guadix et al., 2018). This instrument was also adapted for the Argentine population, demonstrating good psychometric properties among adolescents, with a reliability greater than 0.93 for the total scale (Resett, 2021).

#### 1.4. Sexting assessment

The absence of a universal definition of sexting has caused different studies to use different instruments to assess the occurrence of this type of behavior among youth. Recently, some of the validated measures to assess sexting have focused on sexting among adults, namely the “Sexting Behaviour Scale” (Dir et al., 2012) and the “Conduct Scale on Sexting” (Chacón-López et al., 2016). Regarding the validated instruments for young populations, four instruments stand out in the literature (Gámez-Guadix et al., 2017; Herrera et al., 2015; Penado et al., 2019; Weisskirch & Delevi, 2011). However, almost all have limitations. The “Sexting Attitudes Scale” by Weisskirch and Delevi (2011) focuses only on assessing young people’s attitudes towards sexting. It has the limitation that it cannot infer the frequency of sexting behaviors (Weisskirch & Delevi, 2011). The “Sexual Risk Behaviours and Motivation toward Online Sex Scales” (Herrera et al., 2015) assesses sexting, focusing only on the practice of these types of behaviors between romantic partners. However, the instrument’s reliability was obtained through a sample of participants between 16 and 26 (Herrera et al., 2015). Another instrument is the “Sexting Questionnaire” (SQ) by Gámez-Guadix et al. (2017), a questionnaire consisting of three questions that assess the number of times the young person has voluntarily sent photos, videos, or messages via the internet or cell phone. Finally, the “Escala de Difusión de Imágenes Intimas” (Penado et al., 2019) only assesses the prevalence of sending sexual photos and videos, not including sexually oriented text messages.

In Portugal, there are no validated instruments to assess sexting behaviors. Thus, adapting an instrument to the Portuguese population that contributes to a better understanding of sexting behaviors adopted

by young Portuguese people is essential. Compared with the internationally validated instruments previously mentioned (Gámez-Guadix et al., 2017; Penado et al., 2019), the SQ (Gámez-Guadix et al., 2017) seems to be the most adequate to assess sexting behaviors among young people. This measure allows us to identify, clearly and quickly, how often young people have voluntarily sent photos, videos, and written messages of a sexual nature during the last year. This questionnaire is composed of three questions that evaluate the number of times the youth has voluntarily sent photos, videos, or messages with sexual content via the internet or cell phone. The instrument was validated in Spain and demonstrated good construct validity and internal consistency in a sample of adolescents ( $\alpha = 0.71$ ) (Gámez-Guadix et al., 2017; Gámez-Guadix et al., 2018). This instrument was also adapted for the Argentinian population, demonstrating good internal consistency ( $\alpha = 0.86$ ) (Resett, 2019).

Considering those mentioned above, this study aims to: a) analyze the factor structure and psychometric properties of the Portuguese version of the Questionnaire for Online Sexual Solicitation and Interactions with Adults (QOSSIA); b) analyze the psychometric properties of the Portuguese version of the Sexting Questionnaire (SQ); and c) assess the prevalence of online grooming victimization and sexting behaviors among young Portuguese people.

## 2. Method

### 2.1. Participants

The sample comprised 172 young people between 12 and 17 years aged 12–17 ( $M = 15.84$ ,  $SD = 1.13$ ). It comprised 101 girls (58.7 %) and 71 boys (41.3 %). Of the participants, 72 are victims of online grooming (41.9 %), and 91 (52.9 %) have experienced sexting.

## 3. Measures

**Sociodemographic Questionnaire.** A brief questionnaire was constructed to collect sociodemographic data from the youth: age, gender, and nationality.

**Juvenile Victimization Questionnaire (JVQ; Almeida et al., 2020).** The Portuguese version assessed crime, child abuse, and other types of victimization experienced during childhood. It comprises 34 items in five modules: conventional crimes, child maltreatment, peer and sibling victimization, sexual victimization and testimony, and indirect victimization. Each item is assessed in a dichotomous response format (0 – No, 1 – Yes). Cronbach’s alpha for the total sample was 0.94 (Almeida et al., 2020). In our study, only the sexual victimization module (JVQ-SV) was used ( $\alpha = 0.66$ ).

**Positive and Negative Affect Scale (PANAS-C; Santos-Nunes et al., 2017).** The Portuguese version of the Positive and Negative Affect Scale for Children (PANAS-C) was used. The PANAS-C is a 30-item self-administered scale that assesses the feelings and affects perceived in recent weeks through two subscales: positive affect and negative affect. Each item is assessed in a 5-point Likert response (from 1 – Not at all to 5 – Very much). A higher score represents a higher positive or negative affect. In our study, only positive affect (PA) was used ( $\alpha = 0.95$ ).

**Questionnaire for Online Sexual Solicitation and Interactions with Adults (QOSSIA; Gámez-Guadix et al., 2018).** It assesses the prevalence of online grooming victimization during the past year through two dimensions with five items each. The first dimension concerns sexual solicitations (e.g., “An adult asked me sexually related questions via the internet or cell phone.”) and the second assesses sexual interactions (e.g., “I have sent photos or videos of me with sexual content to an adult.”). The response to each item is given on a 4-point Likert scale, with response options ranging from 0 (never) to 3 (six times or more), and the total score for each dimension ranges from 0 to 15. Additionally, youth are asked how many people over 18 have experienced these behaviors (with none, with one person, with two or three

people, with four or five people, or with six or more people). The instrument demonstrated good psychometric properties, with Cronbach's alpha of 0.87 for the total scale and 0.69 for the sexual requests subscale and sexual interactions subscale in the original version (Gámez-Guadix et al., 2018).

**Sexting Questionnaire (SQ; Gámez-Guadix et al., 2017).** The Sexting Questionnaire is an instrument that allows us to clearly and quickly identify how often young people have voluntarily sent sexual photos, videos, and written messages during the last year. The instrument was validated in Spain and demonstrated good construct validity and internal consistency in a sample of adolescents ( $\alpha = 0.71$ ) (Gámez-Guadix et al., 2017).

### 3.1. Procedure

This study used a cross-sectional design with a non-probability sample. First, the translation of the QOSSIA and the SQ from Spanish into Portuguese followed the 5-step adaptation process recommended by Beaton et al. (2000). The initial version of the scales was translated for participants of both genders, aged 12–17 years, to assess online grooming victimization and the practice of sexting behaviors. All discrepancies were reviewed until no semantic differences were found between the Spanish and Portuguese versions of the QOSSIA and the SQ. The revised version was then tested on Portuguese youth to ensure that they understood it clearly. Since the pilot test results were satisfactory, no changes were made to both instruments.

The inclusion criteria for the study required participants to be: a) between 12 and 17 years old, b) Portuguese nationality, and c) have the intellectual and communicational abilities to answer all the assessment instruments (be able to read and write in Portuguese). Participants were selected through a non-probability snowball sample. Data were collected in 2 tutoring centers, 1 school, 1 soccer club, and 1 scout headquarters. Institutions were contacted to request authorization for data collection. After the directors authorized data collection on institutions, we contacted the youth's parents or legal guardians. The study objectives and procedures were properly explained before the parents or legal guardians signed an informed consent. In addition, verbal consent was also required from minors to participate in the study. The confidentiality of the results, as well as the subjects' anonymity, was ensured. The study followed the ethical principles outlined in the Declaration of Helsinki (World Medical Association, 2024), and the Egas Moniz School of Health and Science Ethics Committee approved the protocol research.

### 3.2. Statistical analysis

An exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) were performed to assess the quality of model adjustment (Marôco, 2014) and compare the values obtained with the factor structure obtained by Gámez-Guadix et al. (2018) for the original version of the QOSSIA. The analyses were performed using AMOS statistical software (Version 28.0, SPSS Inc., Chicago, IL). The quality of the global adjustment of the factor model was performed according to the indices and respective reference values (Marôco, 2014): CFI and TLI measure the adequacy of the model regarding the independent model, with a reference value of  $> 0.90$ ; GFI assesses the relative amount of covariance explained by the model, with reference value  $> 0.90$ ; RMSEA (90 % confidence interval) assesses the discrepancy in the fit between the estimated matrices and the observables, with reference value  $\leq 0.10$ . To verify the assumptions of sample normality, the values of skewness and kurtosis were analyzed. Construct validity was assessed through the Extracted Average Variance (VME;  $\geq 0.5$  cf. Netemeyer et al., 2003) and Composite Reliability (CR;  $\geq 0.7$ ; Netemeyer et al., 2003). Internal consistency was calculated using Cronbach's Alpha ( $\geq 0.7$ ; Field, 2017) to analyze the instrument's psychometric properties. We also examined the convergent and divergent validity of the psychometric properties of

the QOSSIA and the SQ. Finally, we sought to assess the prevalence of online grooming and sexting. Analyses were conducted using IBM SPSS Statistics Version 29.0 statistical software.

## 4. Results

### 4.1. Exploratory and confirmatory factor analysis

The QOSSIA and the SQ did not contain missing values or outliers. We tested the QOSSIA two-factor structure (Fig. 1) validated by the authors of the original version (Gámez-Guadix et al., 2018) through a CFA. The analysis of the fit indices revealed that the model is adequate (CFI = 0.91, GFI = 0.90, TLI = 0.90, RMSEA = 0.08). Since the SQ factor structure had not been investigated in the process of developing the original instrument, an EFA was carried out to test SQ' construct validity. The EFA revealed a one-dimensional structure. Therefore, the one-dimensional structure was tested utilizing CFA. The analysis of the fit indices revealed that the model is adequate (CFI = 1.0, GFI = 1.0, RMSEA = 0.07). The study confirmed multivariate normality for all items since the value was less than 3, and the kurtosis value was less than 7 (Kline, 2011) to QOSSIA and SQ.

All the items' factor loadings of QOSSIA are equal to or higher than 0.70 (Field, 2017) (Table 1). The same can be verified for the SQ (Table 2).

All the QOSSIA items were well correlated (Table 3), and the item-total coefficients suggested that deleting any of the items would not significantly improve the scale's reliability. The same can be verified for the SQ (Table 4).

The dimensions of the two-factor model of the QOSSIA were highly correlated (Table 5).

### 4.2. Convergent and divergent validity

To assess convergent validity, Pearson correlations were performed between the QOSSIA total scale and subscales, SQ scale, and JVQ-SV. Statistically significant positive correlations were found between all scales and subscales (Table 5).

Correlations were performed between positive affect (PANAS-C) and the total QOSSIA scale, the QOSSIA requests, the QOSSIA interactions, and the SQ and positive affect (PANAS-C) to assess divergent validity. Results show negative correlations between positive affect (PANAS-C) and the total QOSSIA scale, QOSSIA requests, QOSSIA interactions, and the SQ (Table 5).

### 4.3. Construct validity

Each factor's Average Variance Extracted (AVE) and Composite Reliability (CR) were estimated to explore the construct validity better. The AVE was satisfactory for all the factors ( $\geq 0.5$  cf. Netemeyer et al., 2003). The value for Solicitations is 0.67, for Interactions is 0.59, and for SQ is 0.71 respectively. The CR was above the minimum recommended for the two factors (Solicitations = 0.91, Interactions = 0.87, SQ = 0.88;  $\geq 0.7$ ; Netemeyer et al., 2003).

### 4.4. Internal consistency

In the internal consistency analysis of the QOSSIA, the values of Cronbach's alphas were good (Field, 2017) for the QOSSIA total scale ( $\alpha = 0.90$ ), the sexual solicitations subscale ( $\alpha = 0.90$ ), and the sexual interactions subscale ( $\alpha = 0.79$ ). The internal consistency analysis of the SQ also revealed a good value of Cronbach alpha ( $\alpha = 0.84$ ).

### 4.5. Prevalence of online grooming victimization and sexting behaviors

Among the participants, 170 (98 %) often communicate via social networks, 138 (80.2 %) have talked to strangers online, and 22 (12.8 %) have

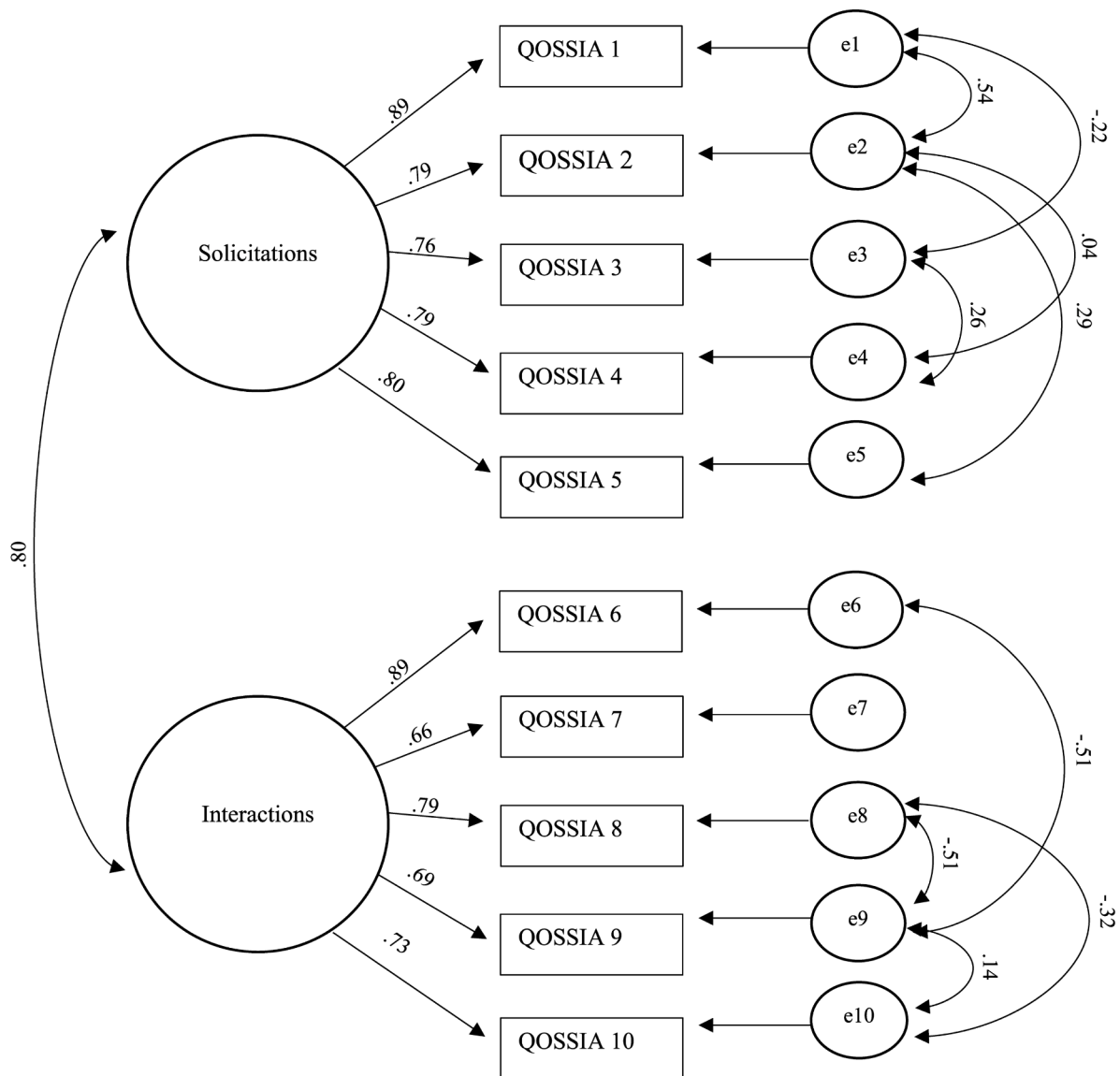


Fig. 1. Factor structure of the QOSSIA.

have experienced online victimization. Among the participants, 72 (41.9 %) reported at least one instance of online grooming solicitations, and 44 (25.6 %) reported interacting sexually with an adult online during the past year. The most common online sexual requests that youth identified were “An adult asked me sexually related questions via the internet or cell phone” ( $n = 65, 37.8\%$ ) and “An adult asked me to send him pictures or videos of me with intimate or sexual content via the internet or my cell phone” ( $n = 54, 31.4\%$ ). The most frequent online sexual interaction among youth was “I talked about intimate things with an adult via the internet” ( $n = 36, 20.9\%$ ) and “I arranged a meeting with an adult I’d met on the internet so that we could meet in person” ( $n = 16, 9.3\%$ ) (Table 6). Of the 67 participants who reported the characteristics of the adult groomer, 63 (36.6 %) identified him as a male, 63 (36.6 %) reported him as an unknown person, and 29 (43.3 %) between 21 and 30 years.

Concerning sexting, 91 (52.9 %) youth stated that they had already voluntarily engaged in at least one sexting behavior during the last year. Specifically, 91 (52.9 %) of the participants stated that they had sent sexual information or text messages, 71 (41.3 %) had sent photos with sexual content, and 28 (16.3 %) had voluntarily sent videos with sexual content during the last year (Table 6).

### 5. Discussion

The present study aimed to analyze the factor structure and psychometric properties of the Portuguese version of the Questionnaire for Online Sexual Solicitation and Interactions with Adults (QOSSIA) and the Sexting Questionnaire (SQ). Furthermore, the study also aimed to assess the prevalence of online grooming victimization and sexting behaviors among a sample of the young Portuguese population. No study in Portugal evaluates online grooming or the voluntary practice of sexting using instruments adapted for the Portuguese population. Therefore, studying this topic is important since online grooming and sexting are two growing phenomena that potentially negatively impact young people’s mental health and normal development.

Regarding statistical fit, CFA revealed that the QOSSIA two-factor models demonstrated an adequate adjustment to data. The QOSSIA is an appropriate assessment tool since it allows for the evaluation of the number of requests and interactions that young people had with adults, as well as to ascertain the characteristics of the adults who approached the young people, namely their age, gender, and whether they met for the first time offline or online. In terms of SQ, the results also revealed good internal consistency and an adequate model fit. The SQ is an appropriate instrument to measure sexting, and it is practiced

**Table 1**  
Standardized regression weights for factor structure of the QOSSIA (n = 172).

| Items  | $\beta$<br>(standardized) |
|--|---------------------------|
| <b>Solicitations</b>   |                           |
| 1. An adult has asked me to send him pictures or videos of me...<br>[Um adulto pediu-me que lhe ...]                 | 0.88                      |
| 2. An adult asked me sexual ... [Um adulto fez-me perguntas ...]   | 0.85                      |
| 3. An adult asked me to have cybersex ... [Um adulto pediu-me para ...]  | 0.77                      |
| 4. An adult, via the internet, asked me to have sex. [Um adulto, através da internet ...]                            | 0.78                      |
| 5. An adult has sent me photos or videos with sexual content in which he/she appears. [Um adulto enviou-me fotos...] | 0.82                      |
| <b>Interactions</b>  |                           |
| 6. I have sent photos or videos of me ... [Enviei a um adulto fotos ...]   | 0.87                      |
| 7. I had a romantic relationship with an adult ... [Mantive uma relação ...]   | 0.70                      |
| 8. I talked about intimate things with an adult ... [Falei sobre coisas íntimas ...]                                 | 0.81                      |
| 9. I arranged a meeting with an adult ... [Combinei um encontro ...]   | 0.70                      |
| 10. We agreed to have sexual contacts... [Combinámos ter contactos...]   | 0.73                      |

**Table 2**  
Standardized regression weights for factor structure of the SQ (n = 172).

| Items  | $\beta$ (standardized) |
|--|------------------------|
| 1. Did you send photos ... [Enviaste fotos ...]            | 1.00                   |
| 2. Did you send pictures ... [Enviaste imagens...]         | 0.80                   |
| 3. Did you send information ..... [Enviaste informação...] | 0.70                   |

voluntarily. In terms of internal consistency, the total QOSSIA scale showed good internal consistency, with values identical to those obtained for the original version of the QOSSIA (Gámez-Guadix et al., 2018) and another adapted version of the instrument (Resett, 2021). Regarding the subscales, our study also showed good internal consistency, with values higher than those obtained for the original version of the QOSSIA (Gámez-Guadix et al., 2018). The SQ's internal consistency values were good, with higher values than those obtained for its original version (Gámez-Guadix et al., 2017) and similar to others (Resett, 2019).

The negative correlation between the total QOSSIA scale and positive emotions points to the divergent validity of the QOSSIA. These results reflect data from the literature showing that the impact of online grooming victimization can be reflected in negative emotions, namely feelings of shame, nervousness, stress, and irritability (Wolak et al., 2006). It was also possible to verify a negative correlation between sexting and positive emotions. This result also reflects other data from the literature showing that sexting practice among youth is associated with negative emotions (Frankel et al., 2018).

Convergent validity was assessed through correlations between the QOSSIA total score and subscales, SQ, and JVQ-SV. Statistically

**Table 3**  
Correlations between QOSSIA items (n = 172).

|               | 1 | 2      | 3      | 4      | 5      | 6      | 7      | 8      | 9      | 10     |
|---------------|---|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 1. QOSSIA 1   | – | 0.85** | 0.62** | 0.70** | 0.70** | 0.65** | 0.41** | 0.64** | 0.43** | 0.40** |
| 2. QOSSIA 2   |   | –      | 0.62** | 0.64** | 0.74** | 0.54** | 0.36** | 0.67** | 0.32** | 0.33** |
| 3. QOSSIA 3   |   |        | –      | 0.70** | 0.61** | 0.60** | 0.50** | 0.50** | 0.29** | 0.46** |
| 4. QOSSIA 4   |   |        |        | –      | 0.61** | 0.53** | 0.44** | 0.54** | 0.41** | 0.51** |
| 5. QOSSIA 5   |   |        |        |        | –      | 0.55** | 0.32** | 0.51** | 0.56** | 0.41** |
| 6. QOSSIA 6   |   |        |        |        |        | –      | 0.58** | 0.69** | 0.45** | 0.66** |
| 7. QOSSIA 7   |   |        |        |        |        |        | –      | 0.51** | 0.46** | 0.54** |
| 8. QOSSIA 8   |   |        |        |        |        |        |        | –      | 0.33** | 0.44** |
| 9. QOSSIA 9   |   |        |        |        |        |        |        |        | –      | 0.57** |
| 10. QOSSIA 10 |   |        |        |        |        |        |        |        |        | –      |

Note. \*\*p < 0.01.

**Table 4**  
Correlations between SQ items (n = 172).

|         | 1 | 2      | 3      |
|---------|---|--------|--------|
| 1. SQ 1 | – | 0.70** | 0.82** |
| 2. SQ 2 |   | –      | 0.54** |
| 3. SQ 3 |   |        | –      |

Note. \*\*p < 0.01.

**Table 5**  
Correlations between Online Grooming (QOSSIA Total), QOSSIA Solicitations, QOSSIA Interactions, Sexting (SQ), Positive Affect (PANAS-C) and Sexual victimization (JVQ-SV) (n = 172).

|                              | 1 | 2      | 3      | 4      | 5       | 6       |
|------------------------------|---|--------|--------|--------|---------|---------|
| 1. QOSSIA Total              | – | 0.98** | 0.86** | 0.70** | –0.41** | 0.70**  |
| 2. QOSSIA Solicitations      |   | –      | 0.73** | 0.66** | –0.43** | 0.68**  |
| 3. QOSSIA Interactions       |   |        | –      | 0.67** | –0.26** | 0.62**  |
| 4. SQ                        |   |        |        | –      | –0.37** | 0.51**  |
| 5. Positive Affect (PANAS-C) |   |        |        |        | –       | –0.26** |
| 6. JVQ-SV                    |   |        |        |        |         | –       |

Note. \*\*p < 0.01.

**Table 6**  
Prevalence of Online Grooming and Sexting (n = 172).

|   | n  | %    |
|---|----|------|
| <b>Online Grooming (QOSSIA)</b>                                   |    |      |
| <b>Solicitations</b>  | 72 | 41.9 |
| 1. An adult has asked me to send him pictures or videos of me ... | 54 | 31.4 |
| 2. An adult asked me sexual ...                                   | 65 | 37.8 |
| 3. An adult asked me ...  | 26 | 15.1 |
| 4. An adult, via the internet ...                                 | 35 | 20.3 |
| 5. An adult has sent me photos or videos ...                      | 53 | 30.8 |
| <b>Interactions</b>   | 44 | 25.6 |
| 6. I have sent photos or videos ...                               | 22 | 12.8 |
| 7. I had a romantic relationship with an adult ...                | 9  | 5.2  |
| 8. I talked about intimate things ...                             | 36 | 20.9 |
| 9. I arranged a meeting with an adult ...                         | 16 | 9.3  |
| 10. We agreed to have sexual ...                                  | 6  | 3.5  |
| <b>Sexting (SQ)</b>   | 91 | 52.9 |
| 1. Sending pictures ...   | 71 | 41.3 |
| 2. Sending videos ...   | 28 | 16.3 |
| 3. Sending text messages ...                                      | 91 | 52.9 |

significant positive correlations were observed between the QOSSIA and the JVQ-SV. These results align with other studies that associate online grooming with a previous history of sexual victimization, namely by childhood sexual abuse (Widuger, 2015). Furthermore, it was possible to verify a statistically significant positive correlation between SQ and JVQ-SV, and these results are corroborated by other studies that associate sexting with sexual abuse (Titchen et al., 2019).

We can verify a significant correlation between the total QOSSIA scale, subscales, and the SQ. Some studies explain this association, revealing a bidirectional relationship between the two phenomena (Gómez-Guadix & Mateos-Pérez, 2019). On the one hand, the practice of sexting is related to a higher probability of the young person suffering victimization by online grooming (Resett, 2021; Reyns et al., 2013), and on the other hand, online grooming is related to youth initiation of voluntary sexting behaviors (Gómez-Guadix & Mateos-Pérez, 2019).

When compared to other studies that used the same instrument to assess online grooming victimization, namely the original version (Gómez-Guadix et al., 2018) and others (Calvete et al., 2022; Ortega-Báron et al., 2022), our study showed higher prevalence values of both the total scale of online grooming and in terms of its subscales. One of the reasons that may explain this higher prevalence in our study was the fact that our research included young people aged 12 to 17 years and was composed mostly of young people aged 16 to 17 years, contrary to the original version of the QOSSIA (Gómez-Guadix et al., 2018) and other studies (e.g., Ortega-Báron et al., 2022) that only included youth aged 12 to 15. Several studies report that older youth have higher levels of online grooming victimization (e.g., Sklenarova et al., 2018).

A higher prevalence was found in online sexual solicitation than in online sexual interactions, as was the case in other studies (Gómez-Guadix et al., 2018; Calvete et al., 2022; Ortega-Báron et al., 2022). Online sexual solicitation is expected to be more frequent since online sexual interaction implies that the young person responds to the solicitations they receive (Gómez-Guadix et al., 2018). Our results indicate that the most common request that youth received was “An adult asked me sexually related questions via the internet or cell phone”, and the most common sexual interaction was “I talked about intimate things with an adult via the internet,” as in another study (Ortega-Báron et al., 2022). One of the possible explanations is the fact that one of the main strategies of groomers is to promote some sexual conversation with the young person, namely with girls (Van Gijn-Grosvenor & Lamb, 2016), initially introducing sexual content, maintaining it, and intensifying the content of the conversation (Williams & Hudson., 2013).

Regarding sexting, our results were higher than those for a reduced version of the SQ (Gómez-Guadix et al., 2017) and others (e.g., Resett, 2019). However, they are identical to another study, which, similar to ours, assessed the prevalence of sexting behaviors practiced voluntarily during confinement due to the COVID-19 pandemic (Maes & Vandesboch, 2022). The social distance between young people may have enhanced this increase in the frequency of the phenomenon to the extent that young people probably used sexting to replace offline sexual behaviors (Maes & Vandesboch, 2022), which may also have been reflected in the results of our study. On the other hand, the fact that our sample was composed mostly of young people between 15 and 17 years old may also have contributed to a higher prevalence of sexting behaviors in this study, as older young people are more predisposed to sexting, which coincides with the onset of puberty (Molla-Esparza et al., 2021) peaking between 16 and 17 years old (Temple et al., 2012). The prevalence of sexting in our study was higher than in another Portuguese study (Barroso et al., 2021), although the authors assessed abusive sexting, contrary to ours. The most frequent sexting behavior among young people consisted of voluntarily sending messages of a sexual nature via the internet or cell phone, similar to other studies (Gómez-Guadix et al., 2017; Resett, 2019).

A recent Portuguese study found that few professionals who work in Portugal identify training skills regarding online sexual grooming. Those professionals identified that training on this phenomenon should be

helpful for them (Carmo & Manita, 2023). This deficiency emphasizes the need for targeted training initiatives tailored to provide professionals with the skills and knowledge to recognize, prevent, and respond effectively to online grooming incidents. Failure to address this gap not only leaves vulnerable youth at risk but also inhibits efforts to combat this type of victimization and protect the well-being of youth in the digital age. Likewise, it is crucial to better identify the online grooming phenomenon with good and specific instruments.

### 5.1. Limitations

This study has some limitations that should be addressed. First, the research was based on a small sample size that was not representative of the Portuguese context. Second, most of the sample is girls and older youth. Third, besides nationality, additional ethnic or racial characteristics were not assessed through the sociodemographic questionnaire. Fourth, the institutions where the data was collected were selected through a non-probabilistic and snowball sampling process, and the sociodemographic characteristics of the participants were not compared to the overall national demographics from middle through secondary students. These limitations compromise the generalization of the obtained results to the Portuguese population. Fifth, all the measures used are self-report instruments so that responses may be compromised by the social desirability inherent to each individual. Thus, we recommend that future research can overcome these limitations and use larger samples.

## 6. Conclusion

Despite the limitations, the results from this study are highly relevant, as it is the first to adapt an instrument to assess online grooming and sexting for the Portuguese youth population. The QOSSIA proved to be adequate in terms of sexual interactions and solicitations. In addition, both instruments showed good internal consistency and an adequate model fit. The QOSSIA allows a complete assessment of online grooming, considering both online sexual solicitations and sexual interactions. In turn, the SQ allows for a simple assessment of sexting among youth.

This study promotes knowledge about online grooming and sexting, alerting to their prevalence and offering the adaptation of two instruments that allow measuring the two phenomena. Furthermore, those two instruments are short, rapidly applicable, and valuable self-report measures to help professionals who work with youth identify risk factors of victimization. Prevention may involve the development of awareness campaigns aimed at young people, which aim to inform them about the phenomena and potential negative consequences while promoting a reflective attitude and notion of online responsibility (Garaigordobil & Martinez, 2015).

Effective intervention strategies are essential to mitigating the impact of sexting and online grooming victimization among youth. Mental health professionals can provide those interventions to address emotional consequences such as anxiety, depression, shame, and fear of the victimized youth. Schools and healthcare settings can implement screening tools to identify at-risk youth, particularly those with a history of childhood sexual abuse, enabling early identification and tailored interventions. Interventions can also include educating families and caregivers on supporting victimized youth.

Collaboration with law enforcement and social workers also ensures the support and protection of victims. Policies to mitigate sexting and online grooming can include mandatory digital safety education in schools. Adopting accessible reporting mechanisms and creating victim support services are also critical to ensuring protection and recovery for victimized youth.

Future studies should seek to increase the sample size and make it more representative to provide a deeper understanding of online grooming and sexting in the Portuguese context. Furthermore, it could be interesting to use qualitative assessment methods to identify the causes that may lead to online grooming victimization and/or voluntary

adoption of sexting behaviors.

## 7. Statements and Declarations

Consent to Participate: All the participants and their parents or legal guardians were informed about the study's aims and about their anonymity and voluntary participation. Informed consent was obtained from the parents or legal guardians and from all the participants included in the study.

## 8. Ethics Approval

The present research was approved by the Egas Moniz School of Health and Science Ethics Committee. All procedures were in accordance with the Declaration of Helsinki.

## Funding

CiiEM has provided support through Project <https://doi.org/10.54499/UIDB/04585/2020>, funded by FCT (Foundation for Science and Technology).

## Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

## Acknowledgments

The authors would like to express their profound gratitude to all the participants who voluntarily provided information for this study and the institutions that consented to participate.

## Data availability

Data will be made available on request.

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