



Child Maltreatment Profiles among Children and Adolescents in the Spanish Child Welfare System

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Abstract

Maltreatment is a complex and multidimensional construct. Several types of maltreatment exist, but not all of them necessarily co-occur. In the last decades, researchers have tried to untangle the heterogeneity of maltreatment. However, few studies have been carried out outside the U. S. and none of the previous studies had considered all stages of maltreatment. In this study, we aimed at exploring latent profiles of maltreatment in a sample of 635 children and adolescents enrolled at different intervention plans within the Child Protective Services (CPS) in the Valencian Community, Spain. Latent Profile Analysis (LPA) was performed. Profiles were based on the five types of maltreatment (physical abuse, emotional abuse, sexual abuse, emotional neglect and physical neglect), as measured by the Childhood Trauma Questionnaire-Short Form. Moreover, associations between the emerging profiles and sociodemographic, health- and school-related variables were also examined. Three profiles of maltreatment were found: “Relative low maltreatment” (58.58%), “Neglected” (35.92%), and “Severely abused and neglected” (5.5%). Then, profiles were contrasted with the reasons why court dictated maltreatment status of the child/adolescent to validate the maltreatment profiles. Results regarding the cumulative nature of maltreatment and its severity suggest tailoring public policies by level of risk of maltreatment. This study further proposes moving the focus of action from individuals themselves to the elements that characterize different maltreatment profiles, with the aim of protecting them. Future research ought to expand knowledge on maltreatment profiles in other European countries so as to promote generalization of results.

Keywords Child protective services · Latent profile analysis · Abuse · Neglect

1 Introduction

Child maltreatment is a complex, multidimensional construct in which severity, frequency, chronicity, developmental timing and types of maltreatment are to be considered (Rivera et al., 2018). The World Health Organization (WHO, 2016) defines child maltreatment according to three different types of violence: physical, emotional and sexual. Additionally, abuse and neglect are considered separately for physical and emotional violence (WHO, 2016).

1.1 Characteristics of the Child Welfare System

Public policies against child maltreatment have evolved from placing the child as a passive object of protection to a more avant-garde position that places the child as an active participant in his or her development (Biagioli et al., 2022). Within the geographical area in which this study develops, the public Child Protection Services (CPS) differentiate levels or stages of risk of maltreatment and carry out different actions accordingly. These psycho-socio-educational actions are articulated at different levels: prevention, protection and re-education. The prevention system is designed taking into consideration the socialization of the child/adolescent within their biological family environment and community reference networks (Martínez Virto & Azcona Martínez, 2020). In this line, resources for the prevention of maltreatment ought to be transversal and interdisciplinary (Jones et al., 2020), and available within the community (Ellis & Dietz, 2017; Lo & Cho, 2021).

On the other hand, protection and re-education actions are considered to present greater coverage against risks (Austin et al., 2020). These actions are integrated in the CPS to protect and/or re-educate (i.e. resocialize) children and adolescents. Evidence shows that actions at both levels actively collaborate to reduce risks (Martin et al., 2021).

Moreover, the severity of risk levels of maltreatment has been related to different dynamics (Schofield et al., 2015); from prevention with a more controlled level of risk to re-education with a less predictable level of risk. In the context of the Spanish CPS, these act at all three levels of risk and include children and adolescents between 0 and 18 years old. The CPS ultimately play a role in other welfare areas (Drake et al., 2022), such as education, social services, justice, housing and health.

1.2 Maltreatment Associated Outcomes

There is no doubt about its adverse effects in the psychological, physical and social development of the victims. Child maltreatment has repeatedly been associated to internalizing symptoms (Appleyard et al., 2010; Bolger & Patterson, 2001; Heleniak et al., 2016; Mills et al., 2013; Robinson et al., 2009), which refer to problems such as anxiety, depression, social withdrawal and somatic complaints (Levesque, 2011).

Child maltreatment has also been linked to externalizing problems (Heleniak et al., 2016; Manly et al., 2013; Mills et al., 2013), that are manifestations of aggressive and delinquent behaviour (Levesque, 2011). Additionally, child maltreatment has been linked to alterations in both brain structure and brain function (for a review, see

Teicher et al., 2016), and in memory (Goodman et al., 2010) and language development (Sylvestre et al., 2016). In the same line, different studies report an association between neuropsychological damage and risk of developing psychiatric disorders among individuals who have experienced maltreatment (Arora & Bhattacharya, 2024; Cabrera et al., 2020; Korolevskaia & Yampolskaya, 2023; Maxfield et al., 2023).

Maltreatment during childhood has also been linked to adverse events during adolescence, such as relationship problems with peers and affective disruptions (Handley et al., 2019), which become more evident during the first dating experience. Furthermore, maltreatment has been related to poorer physical health conditions (Afifi et al., 2016; Widom et al., 2012) and experiences of child maltreatment have been consistently associated to diminished quality of life (Weber et al., 2016).

In this line, children and adolescents are vulnerable to several forms of maltreatment (Yoon, 2017). Research has found different associations between the amount and types of maltreatment and negative associated outcomes. Regarding different types of maltreatment, it has been shown that sexual abuse and neglect are more related to internalizing symptoms (Lewis et al., 2016; Mills et al., 2013), while physical and emotional abuse have a higher impact on externalizing symptoms (Villodas et al., 2016; Yoon et al., 2018).

Physical health conditions such as malnutrition, arthritis, high blood pressure, cancer or stroke have been associated to physical abuse (Afifi et al., 2016; Monnat & Chandler, 2015; Widom et al., 2012), while oral health and vision problems were related to neglect (Widom et al., 2012).

Sexual abuse, on the other hand, has been linked to oral health problems, hepatitis C and teenage pregnancy (Roberts et al., 2004; Widom et al., 2012). Further, sexual abuse has also been related to functional limitations (Monnat & Chandler, 2015); diminished psychological well-being (Roberts et al., 2004); and higher risk of developing problems related to depression and anxiety (Guerra et al., 2018). Weber et al. (2016) showed that the relationship between diminished quality of life and maltreatment was stronger when more than one type of maltreatment is reported.

1.3 The Study of the Typologies of Maltreatment

In maltreatment research, as well as in other disciplines within the Social Sciences, the use of a variable-centered approach has been the gold standard (Howard & Hoffman, 2018; Roesch et al., 2010). A variable-centered approach describes relationships among variables assuming that the population of reference constitutes a uniform group (Laursen & Hoff, 2006).

An alternative approach to the study of child maltreatment is person-centered. This approach aims at identifying groups of individuals within the sample, based on their responses to a set of observed variables (Wang & Wang, 2012). Over the last decades, the popularity of the person-centered approach within the field of child maltreatment has grown considerably (Swartout & Swartout, 2012). The main reason may be that this approach allows to capture the multidimensional nature of maltreatment and its heterogeneous associated outcomes (Milne et al., 2021), and therefore allows researchers to study diversity within individuals who may experience, or may have experienced, maltreatment.

Some previous work has approached maltreatment research from this person-centered perspective. Most of these studies have been done in American samples (Berzenski & Yates, 2011; Grasso et al., 2013; Havlicek, 2014; Hazen et al., 2009; Kang et al., 2015; Noonan et al., 2010; Pears et al., 2008; Petrenko et al., 2012; Rebbe et al., 2017; Villodas et al., 2014; Warmingham et al., 2019). From these, the majority employed child and adolescent samples, and only one study used an adult sample (Berzenski & Yates, 2011). Only in six studies there was an official record of maltreatment, all of which either used fostered youth (Havlicek, 2014; Pears et al., 2008; Petrenko et al., 2012; Rebbe et al., 2017) or youth still living with their perpetrators (Grasso et al., 2013; Warmingham et al., 2019).

Other studies analysing latent maltreatment classes have been developed in India (Charak & Koot, 2015), Canada (Romano et al., 2006), Burkina Faso (Ismayilova et al., 2016), China (Zuo et al., 2021), Denmark (Armour et al., 2014), Austria (Aebi et al., 2015; Sölva et al., 2020), the Netherlands (Charak et al., 2018) and the United Kingdom (Armour, 2021). All these studies employed self-reports to assess maltreatment, and only one of them (Sölva et al., 2020) employed a sample of participants with an official record of maltreatment, who were in foster care.

All in all, there is a lot of heterogeneity in sample sizes, measurement instruments and sample characteristics among these studies, which may be playing a role in the number of maltreatment subgroups found in each of them. Among the studies including non-maltreated individuals, a no maltreatment class emerged as the most predominant (Aebi et al., 2015; Armour, 2021; Armour et al., 2014; Charak et al., 2018; Hazen et al., 2009; Ismayilova et al., 2016; Noonan et al., 2010; Romano et al., 2006; Villodas et al., 2014; Warmingham et al., 2019; Zuo et al., 2021).

For studies using samples with an official record of maltreatment, the number of classes found oscillated between three (Grasso et al., 2013; Rebbe et al., 2017; Sölva et al., 2020) and four (Havlicek, 2014; Pears et al., 2008; Petrenko et al., 2012; Warmingham et al., 2019). All these studies found a class/profile of severe maltreatment, which represented between 10% and 37% of the respective samples. Most studies also detected a less severely maltreated class. Moreover, classes characterized only by neglect were identified in some of the studies. Class/profile classification depended on the indicators used in the latent classes/profiles. Studies by Pears et al. (2008), Petrenko et al. (2012) and Warmingham et al. (2019) applied the Maltreatment Classification System (MCS; Barnett et al., 1993), while studies by Grasso et al. (2013), Havlicek (2014) and Rebbe et al. (2017) used ad-hoc instruments, and Sölva et al. (2020) employed the Childhood Trauma Questionnaire-Short Form (CTQ-SF; Bernstein et al., 2003).

Across this literature, individuals classified within a class of severe maltreatment characterized by high levels of all types of maltreatment are at higher risk for externalizing behaviour problems (Grasso et al., 2013; Petrenko et al., 2012). The study by Rebbe et al. (2017) additionally found these individuals to present more internalizing problems. In its part, Pears et al. (2008) found lower cognitive functioning in individuals classified as neglected. Finally, Sölva et al. (2020) found an association between the most severely maltreated class of individuals and higher posttraumatic stress disorder symptom severity. Overall, associations between maltreatment profiles and different outcomes suggest that, although maltreatment can be differentiated

in subtypes, it is cumulative and higher levels of maltreatment imply a higher number of types of maltreatment and more severe associated outcomes.

Up to our knowledge, there have not been any studies looking at maltreatment subtypes in a sample that covers the full domain of maltreatment and the full age range. That is, there is no record of studies analyzing the maltreatment profiles of children and adolescents who have been derived to different intervention plans depending upon the severity of maltreatment. This is likely due to difficulties for accessing individuals who are being attended by different departments within CPS. The aforementioned studies used samples of youth in foster care, except for two studies that employed samples of youth with an official record of maltreatment who were living with their perpetrators (Grasso et al., 2013; Warmingham et al., 2019). The present study aims at overcoming this issue by including individuals involved in all levels of the Child Welfare Services (CWS). In this way, we will try to tackle the full domain of maltreatment and the full age range. In addition, to our knowledge, maltreatment typologies have not been studied using Spanish samples yet, so this work add more evidence on the typologies of maltreatment in the Spanish territory.

Moreover, most studies employed Latent Class Analysis (LCA), which is indicated for categorical indicators (Wang & Wang, 2012) and only the study by Pears et al. (2008) applied Latent Profile Analysis (LPA), which allows indicators to be continuous. Albeit some indicators of maltreatment may be naturally categorical, most of them have been categorized for the purposes of the studies. Categorizing maltreatment scores reduces variability and this could lead to a less fine-grained distinction among the latent classes or profiles, due to range restriction of the variables and its subsequent relationship attenuation (Crocker & Algina, 2006).

1.4 Objectives and Hypotheses

Given the multidimensional nature of maltreatment and the evidence of several types of maltreatment, but not necessarily all of them, co-occurring, we hypothesize that the heterogeneous maltreated child and adolescent population will be distinguished into homogeneous subpopulations according to the types of maltreatment they experience. Based on previous literature examining the coexisting typologies of child maltreatment in individuals enrolled in the CPS (Grasso et al., 2013; Havlicek, 2014; Pears et al., 2008; Petrenko et al., 2012; Rebbe et al., 2017; Sölva et al., 2020; Warmingham et al., 2019), we further expect between three and four different profiles of maltreated individuals. Based on these studies, at least we expect finding a group of severely maltreated individuals, a group less severely maltreated and a group characterized mainly by having been neglected. Emerging profiles will be validated using the court reasons alleged for dictating maltreatment.

A second aim of the study is to depict the resulting profiles, by examining the associations between profiles and sociodemographic, health- and school-related variables. Relying on previous results, we expect that profiles with higher levels of maltreatment will be more likely to present severe associated health- and school-related outcomes (i.e. having a health diagnosis, attending an addictive behavior unit, attending a public health service, having curricular adaptations, being included into an attention to diversity program, receiving support for language and communica-

tion), given previous studies linking the occurrence of psychiatric disorders among maltreated individuals (Arora & Bhattacharya, 2024; Cabrera et al., 2020; Korolevskaia & Yampolskaya, 2023; Maxfield et al., 2023), poorer health conditions (Afifi et al., 2016; Widom et al., 2012), and relationship problems with peers (Handley et al., 2019). Additionally, we expect an association between a group of sexually abused individuals and the female gender, in line with previous evidence (Stoltenborgh et al., 2015; Walker et al., 2004; Wellman, 1993). Finally, we expect a positive association between age and severity of maltreatment, given the cumulative nature of maltreatment (Jackson et al., 2014; Sölva et al., 2020; Yampolskaya et al., 2015).

2 Method

2.1 Method and Procedure

Data employed in this study comes from the first wave of Determinants d'Atenció Primerenca 360° (DAP360°), a longitudinal study of the determinants of children's and adolescents' risk of maltreatment. Convenience sampling was used to recruit workers from all areas within the CPS in the Valencian Community (Spain). Data was gathered using an online survey. Sampling was carried out by the regional government. Given the legal requirements on the Protection of Personal Data, the researchers were not able to access the information regarding who or how many workers were contacted. Researchers in this study had no control over the characteristics of the potential sample, with the exception of two inclusion criteria: workers had to have at least 5 years of experience in the CPS and at least one worker from each participating institution had to be from a managerial position. The workers in the CPS were requested to provide data from the official records of cases they had attended. Workers were previously instructed to fill the assessment forms and data gathering was done using an online survey platform. The study met APA's ethical standards and signed informed consents were collected from the CPS workers. The study protocol was approved by the Ethics Commission of the Valencian Government (Ref. CSV:HYH5NVSA-Y85ZSB11-RML6ZCYX).

In total, 273 workers from all services participated in the study: 5.9% worked in family foster care, 7.3% in community centers for young and adolescents, 3.7% in emancipated foster youth, 11.9% in reception centers, 29.7% in residential foster care, 8.9% in juvenile justice centers, 30.5% in social services, and 1.9% in other services. On average, they had been working in the CWS 9.56 years ($SD=7.95$). More than two thirds (77.3%) identified as female, while 20.5% identified as male and the remaining 2.2% identified as other. These individuals provided information about 635 children and adolescents. From these, 17 (2.7%) cases were discarded due to missing data in the main measure employed in the study. These missing cases were due to the informants starting the survey but not having enough time to finish it, leaving it incomplete, or because they experimented some incident related to the online platform and could not complete the survey. Therefore, the final sample was composed by 618 individuals, from which 42.2% identified as females, 57.2% identified as males and 0.6% identified as other. Their age ranged between 0 and 18 years old,

with a mean age of 12.16 ($SD=5.22$). Finally, 35.1% were living in their household, 49% were in residential foster care, 14.7% were in family foster care and for 1.1% we did not have this information.

2.2 Instruments

Maltreatment was measured with the Childhood Trauma Questionnaire-Short Form (CTQ-SF; Bernstein et al., 2003). This instrument contains 28 items tapping five dimensions of abuse and neglect: physical abuse, emotional abuse, sexual abuse, physical neglect and emotional neglect. The Spanish version of the instrument has been shown to present adequate psychometric properties (Hernandez et al., 2013). Although the scale was originally designed as a self-report measure, items were applied to official CPS records in this study, after adapting the scale and obtaining evidence of a five-factor structure of the CTQ-SF (physical abuse, emotional abuse, sexual abuse, emotional neglect and physical neglect) as well as evidence of convergent validity and internal consistency (Tomás et al., 2024). Example items of the scale are “The child/adolescent wears dirty clothes”, “The child/adolescent has been punished with a belt, a board, a cord, or some other hard object”, and “Someone tried to make the child/adolescent do sexual things or watch sexual things”. Answers were coded in a five-point Likert scale, ranging from 1 (never true) to 5 (very often true).

To validate the maltreatment profiles, a series of binary indicators (yes/no) were used. These indicators recorded the reasons why the court had dictated the maltreatment status of the child/adolescent. These reasons included: parent-related variables, physical neglect, safety needs neglect, educational needs neglect, mental health needs neglect, physical abuse, emotional abuse, child/adolescent usage, perversion, sexual abuse, prenatal abuse, abandonment, labor exploitation, parent incompetence to control child/adolescent behavior, child/adolescent migration without adult.

Additional indicators were employed to depict the resulting maltreatment profiles. Sociodemographic indicators included age, gender and living situation (at home, family foster care or residential foster care). Health-related indicators assessed whether the child/adolescent: (1) had a health diagnosis, such as major mental disorder, generalized developmental disorder, circulatory disorder or cerebral palsy; (2) was attending an addictive behavior unit due to substance use; and (3) was attending a public health service because of a court order. School-related indicators included whether the child/adolescent: (1) has curricular adaptations; (2) was included into a program of attention to diversity; and (3) received support for language and communication.

2.3 Statistical Analyses

First, descriptive statistics were computed for the measures involved in the study. Then, latent mixture modelling was carried out. The model employed was Latent Profile Analysis (LPA), with the five different types of maltreatment included as indicators for the latent profiles.

To assess the optimum number of profiles to be retained, statistical criteria and interpretability of the profiles were considered (Lukocienė et al., 2010). Regarding statistical criteria, the following test statistics and indices were considered: Lo-

Mendell-Rubin Likelihood Ratio (LMR LR) test, Bootstrapped Likelihood Ratio Test (BLRT), Akaike Information Criterion (AIC), Bayesian Information Criterion (BIC) and entropy. LMR LR Test and BLRT compare a certain model with k profiles to a model with $k-1$ profiles. A non-significant p -value would indicate no significant improvement of the k -profiles model compared to the $(k-1)$ -profiles, more parsimonious, model (Wang & Wang, 2012). Lower values of AIC and BIC indicate improvement in relative model fit. Among all these indices and tests, the BIC and the BLRT have been shown to perform better (Nylund et al., 2007). Finally, entropy is a measure of classification quality, with values ranging from 0 to 1, and higher values indicating better classification. A value of 0.80 or higher is considered adequate (Clark, 2010). Models were estimated using Robust Maximum Likelihood estimation (MLR). Missing data was handled using Full Information Maximum Likelihood (FIML), which is deemed adequate for missing mechanisms Missing Completely at Random (MCAR) and Missing at Random (MAR). However, Little's MCAR test showed that data could not be considered to behave according to a MCAR mechanism ($c^2(46)=115.07, p<.001$).

Once the number of maltreatment profiles was determined, latent profile membership was saved for each child and adolescent and merged with the original data and we employed analysis of variance (ANOVA) to examine statistically significant differences in the five types of maltreatment (physical abuse, emotional abuse, sexual abuse, physical neglect and emotional neglect) across maltreatment profiles.

Then, χ^2 tests and associated effect sizes were computed for validating the profiles, using the reasons why the court had dictated the maltreatment status of the child/adolescent as validation criteria. As a final step, further contrasts with sociodemographic, health- and school-related indicators across latent profiles were done. For this purpose, ANOVA, χ^2 tests and associated effect sizes were computed. Effect sizes measures employed were partial eta-squared (η^2) in ANOVA and Cramer's V in the case of χ^2 tests. Using profile membership for group comparison outside the mixture modeling context has been regarded an adequate practice whenever entropy is high (Clark, 2010). Descriptive statistics and contrasts were done using SPSS 26, and LPA was done in MPlus 8.7 (Muthén & Muthén, 1998–2021).

3 Results

3.1 Sample Statistics

Among the 618 children and adolescents, about one third receives curricular adaptations at school (33.5%) and one fifth is in an attention to diversity program (20.6%). Regarding their health, around one fifth of the children and adolescents involved in the study have a health diagnosis (19.9%). The most reported type of maltreatment in the general sample was emotional neglect ($M=3.00, SD=1.17$), followed by physical neglect ($M=2.16, SD=0.98$). For a complete picture, please see Table 1.

Table 1 Sample statistics of the variables involved in the study

Characteristics	Mean $\pm$ SD or <i>n</i> (%)
Sociodemographic, school- and health-related variables	
Age (years)	12.16 $\pm$ 5.22
Health diagnosis (yes)	123 (19.9)
Attending addictive behavior unit (yes)	49 (7.9)
Public health service (yes)	69 (11.2)
Curricular adaptations (yes)	207 (33.5)
Attention to diversity program (yes)	127 (20.6)
Language and communication support (yes)	76 (12.3)
Maltreatment dimensions	
Emotional abuse	1.81 $\pm$ 0.95
Physical abuse	1.34 $\pm$ 0.68
Sexual abuse	1.23 $\pm$ 0.64
Emotional neglect	3.00 $\pm$ 1.17
Physical neglect	2.16 $\pm$ 0.98
Reasons why maltreatment status was declared (yes)	
Parent-related variables	411 (66.5)
Physical neglect	187 (30.3)
Safety needs neglect	247 (40.0)
Educational needs neglect	143 (23.1)
Mental health needs neglect	168 (27.2)
Physical abuse	101 (16.3)
Emotional abuse	189 (30.6)
Child/adolescent usage	47 (7.6)
Perversion	15 (2.4)
Sexual abuse	42 (6.8)
Prenatal abuse	26 (4.2)
Abandonment	65 (10.5)
Labor exploitation	4 (0.6)
Parent incompetence	240 (38.8)
Migration without adult	46 (7.4)

Table 2 Fit of models from 1 to 4 profiles

#C	AIC	BIC	Entropy	LMR LR Test	<i>p</i>	BLRT	<i>p</i>
1	7098.6	7142.8	NA	NA	NA	NA	NA
2	6481.2	6552.0	0.910	629.39	0.008	629.39	<0.001
3	6127.0	6224.4	0.819	366.15	<0.001	366.15	<0.001
4	5686.5	5810.5	0.908	452.5	0.282	452.51	<0.001

AIC Akaike Information Criterion, *BIC* Bayesian Information Criterion, *LMR LR Test* Lo-Mendell-Rubin Likelihood Ratio test, *BLRT* Bootstrapped Likelihood Ratio Test, *NA* Not applicable

3.2 Latent Profiles of Maltreatment

LPAs from 1 to 4 profiles were estimated. The 1-profile model was taken as a baseline model in terms of fit. Table 2 shows test statistics and fit indices for all four models. Although the model with four profiles has the lowest information criteria and very

good entropy, the LMR LR Test shows no significant improvement in fit compared to the model with three profiles. Moreover, the model with three profiles still presents a good value of entropy and is better in terms of interpretability. As a result, the model with three profiles is retained.

To interpret these three maltreatment profiles, we used estimated sample means across the five different types of maltreatment. Profile 1 was composed by 362 (58.58%) individuals and it was characterized for presenting low estimated means in all five indicators, with the means of emotional and physical neglect being slightly higher (values being 2.30 and 1.58, respectively) than the means of abuse (1.45 emotional abuse, 1.14 physical abuse, 1.06 sexual abuse). Profile 2 contained 222 (35.92%) individuals with the highest means of emotional and physical neglect (4.06 and 3.04, respectively) but rather medium-low means in all three types of abuse (2.26 for emotional abuse, 1.56 for physical abuse, 1.15 for sexual abuse). Finally, Profile 3 was composed by 34 (5.5%) children and adolescents who presented the highest estimated means in emotional, physical and sexual abuse (2.91, 2.06 and 3.44, respectively), and further had considerably high means in emotional and physical neglect (3.60 and 2.59, respectively). We labelled Profile 1 as “Relative low maltreatment”, Profile 2 as “Neglected” and Profile 3 as “Severely abused and neglected”. The estimated means are depicted in Fig. 1 for the three resulting profiles.

Results regarding the differences in the different types of maltreatment across the three profiles show statistically significant differences ($p < .05$) in all five types of maltreatment. A summary of the results is available in Table 3. Post-hoc tests further suggest that there are statistically significant differences among the three profiles in each type of maltreatment, except for physical abuse, in which the neglected profile

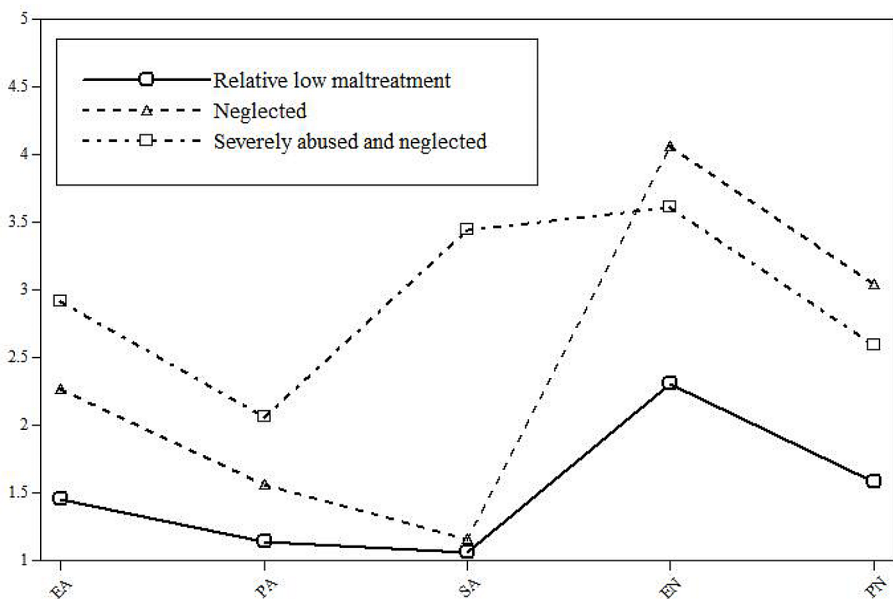


Fig. 1 Estimated means of types of maltreatment depending on the profile. Note: EA = Emotional abuse; PA = Physical abuse; SA = Sexual abuse; EN = Emotional neglect; PN = Physical neglect

Table 3 ANOVA results comparing maltreatment profiles across the five types of maltreatment

Indicator	F	gl1	gl2	p	η^2
Emotional abuse	94.28	2	522	<0.001	0.266
Physical abuse	56.67	2	545	<0.001	0.173
Sexual abuse	820.71	2	495	<0.001	0.769
Emotional neglect	336.46	2	581	<0.001	0.538
Physical neglect	359.40	2	615	<0.001	0.540

Table 4 Sample statistics of maltreatment types across profiles

Indicator	Profile	M	SD	SE	95% CI	
					LL	UL
Emotional abuse	Relative low maltreatment	1.45	0.59	0.03	1.38	1.51
	Neglected	2.30	1.08	0.08	2.14	2.47
	Severely abused	2.95	1.16	0.20	2.54	3.37
Physical abuse	Relative low maltreatment	1.13	0.32	0.02	1.09	1.16
	Neglected	1.59	0.85	0.06	1.47	1.72
	Severely abused	2.08	1.22	0.22	1.64	2.52
Sexual abuse	Relative low maltreatment	1.05	0.21	0.01	1.03	1.08
	Neglected	1.17	0.36	0.03	1.11	1.23
	Severely abused	3.46	0.67	0.12	3.20	3.72
Emotional neglect	Relative low maltreatment	2.29	0.86	0.05	2.20	2.39
	Neglected	4.10	0.58	0.04	4.02	4.18
	Severely abused	3.54	1.17	0.20	3.13	3.96
Physical neglect	Relative low maltreatment	1.57	0.51	0.03	1.52	1.62
	Neglected	3.08	0.82	0.06	2.98	3.19
	Severely abused	2.49	0.96	0.17	2.15	2.83

*M*Mean, *SD*Standard Deviation, *SE*Standard Error, *95% CI*95% Confidence Interval, *LL*Lower limit, *UL*Upper limit

and the severely abused profile do not differ. In general, the severely abused profile presents the highest levels in abuse, emotional and sexual, while the neglected profile presents the highest levels of physical and emotional neglect. The relatively low maltreatment profile has the lower levels of all five types of maltreatment. Sample statistics of the five dimensions of maltreatment according to each profile are available in Table 4.

3.3 Latent Profiles Validation

Results from the χ^2 tests between maltreatment profiles and court reasons to dictate maltreatment are displayed in Table 5. There are statistically significant associations between maltreatment profiles and all reasons except for parent-related variables, child/adolescent usage, abandonment, parent incompetence to control child/adolescent behavior and child/adolescent migration without adult. Table 6 depicts the percentage of individuals within each profile that recorded a positive answer for the significant ($p < .05$) chi-square tests.

Table 6 shows that across all profiles, the “Relative low maltreatment” profile, has the lowest percentages of positive responses to court reasons to dictate maltreatment. The “Severely abused and neglected” profile presents the highest percentages

Table 5 Results from χ^2 tests between maltreatment profiles and reasons

Reasons	χ^2	df	<i>p</i>	V
Parent-related variables	3.29	2	0.193	0.073
Physical neglect	66.06	2	<0.001	0.327
Safety needs neglect	55.15	2	<0.001	0.299
Educational needs neglect	16.52	2	<0.001	0.164
Mental health needs neglect	23.82	2	<0.001	0.196
Physical abuse	39.32	2	<0.001	0.252
Emotional abuse	34.57	2	<0.001	0.237
Child/adolescent usage	0.231	2	0.891	0.019
Perversion	37.15	2	<0.001	0.245
Sexual abuse	172.35	2	<0.001	0.529
Prenatal abuse	8.92	2	0.012	0.120
Abandonment	4.33	2	0.115	0.084
Labor exploitation	15.96	2	<0.001	0.161
Parent incompetence	1.19	2	0.552	0.044
Migration without adult	1.20	2	0.549	0.044

Table 6 Percentage of positive response within profiles

Reasons	1. Relative low maltreatment	2. Neglected	3. Severely abused and neglected
Physical neglect	17.7	49.1	41.2
Safety needs neglect	27.7	57.2	58.8
Educational needs neglect	17.5	32.0	26.5
Mental health needs neglect	19.9	38.3	32.4
Physical abuse	9.1	24.3	41.2
Emotional abuse	22.4	39.2	61.8
Perversion	0.8	2.7	17.6
Sexual abuse	2.8	5.0	61.8
Prenatal abuse	2.2	6.8	8.8
Labor exploitation	0.6	0.0	5.9

of positive responses in abuse-related reasons: physical abuse, emotional abuse, perversion, sexual abuse, prenatal abuse and labor exploitation. This profile also has high percentages, together with the “Neglected” profile, of positive responses to neglect-related reasons. The “Neglected” profile, however, has medium percentages of positive responses to reasons related to physical abuse and emotional abuse, and low percentages to the other abuse-related reasons.

3.4 Associations to Sociodemographic, Health- and School-Related Variables

Results from the ANOVA show statistically significant differences in age across maltreatment profiles: $F(2, 601)=9.91$, $p<.001$, $\eta^2=0.032$. Post-hoc tests revealed differences between the “Relative low maltreatment” profile ($M=12.83$, $SD=4.76$) and the “Neglected” profile ($M=10.92$, $SD=5.76$). No statistically significant differences

in age were found between the “Severely abused” profile ($M=13.12$, $SD=4.80$) and the two others.

Regarding gender, the results of the test were also statistically significant, $\chi^2(4)=16.11$, $p=.003$, $V=0.114$. The majority of individuals within the “Relative low maltreatment” profile are men (60.5%), 38.4% are female and 1.1% identify as other. This 1.1% represent all four individuals who identify as other. Within the “Neglected” profile, approximately half, 55.9%, are male and 44.1% identify as females. Finally, in the “Severely abused and neglected” profile there is a higher proportion of females (70.6%) as compared to males (29.4%).

The association between living situation and maltreatment profiles is also statistically significant: $\chi^2(4)=22.79$, $p<.001$, $V=0.137$. Within the “Relative low maltreatment” profile, 46.8% are in residential foster care, 10.9% are in family foster care and 42.3% are at home. Within the “Neglected” profile, 52.8% are in residential foster care, 21.1% are in family foster care and 26.1% are at home. Finally, within the “Severely abused and neglected” profile, 58.8% are in residential foster care, 17.6% are in family foster care, and 23.5% are at home.

No significant associations are found between the maltreatment profiles and any health-related or school-related variables. Results from these tests are shown in Table 7.

4 Discussion

The present research aimed at identifying underlying profiles of maltreatment within a heterogeneous population of children and adolescents who are susceptible to having experienced maltreatment. Moreover, this study proposed to study differences across emerged profiles in a series of sociodemographic, health- and school-related variables.

In this study, three latent profiles of maltreatment were found based on patterns of individuals’ scores from the five types of maltreatment considered: the “Relative low maltreatment” profile (58.6% of the sample), the “Neglected”, profile (35.9% of the sample; and the “Severely abused and neglected” profile (5.5% of the sample). These results are very similar to those of Sölva et al. (2020). These authors performed LCA in a sample of Austrian foster youth and found a “Low trauma”, a “Neglect only” class, and a “Cumulative trauma” class. However, the percentages of each class

Table 7 Results from χ^2 tests between maltreatment profiles and health- and school-related variables

	χ^2	df	p	V
Health-related				
Health diagnosis	1.85	2	0.396	0.055
Addictive behavior unit	2.24	2	0.327	0.060
Public health service	2.20	2	0.333	0.060
School-related				
Curricular adaptations	1.39	2	0.498	0.048
Attention to diversity program	2.97	2	0.226	0.069
Language and communication support	1.14	2	0.566	0.043

found in the study by Sölva et al. (2020) differed to the ones found for this study's profiles, with less individuals classified as "Low trauma" and more individuals classified as "Cumulative trauma". This could probably be due to the samples used in each study. Sölva et al. (2020) used a sample of children and adolescents already living in foster care, whom could be considered to be in a more critical maltreatment status, while our study employed data from children and adolescents at different stages of maltreatment and part of whom had not needed to leave their home. Another possibility is that the small sample size of the study by Sölva et al. (2020), only 147 participants, is responsible for an unstable class solution (Roesch et al., 2010). The present study, together with that by Sölva et al. (2020) represent the only studies carried out in Europe using cases from official records of maltreatment. This work's findings of maltreatment profiles similar to those reported in Sölva et al. (2020) add evidence on the presence of three different subgroups of maltreatment individuals within the CPS in Europe.

After identifying the latent profiles of maltreatment, a second step of the research question was to validate those profiles by examining the associations between court reasons to dictate maltreatment and these profiles. Results supported the interpretations of maltreatment profiles.

As a secondary aim of the study, we aimed to depict the profiles by examining their associations to sociodemographic, health- and school-related variables. Regarding the sociodemographic variables, multiple associations were found. On the one hand, there was a significant age difference between the "Relative low maltreatment" profile and the "Neglected" profile, being the latter younger than the former. Albeit non-significant it is also worth noting that the "Severely abused and neglected" profile presented the highest age. These results could be thought as emotional and physical neglect being the most common types of maltreatment suffered by younger children/adolescents, and also as maltreatment being cumulative along time, in line with previous research (Jackson et al., 2014; Sölva et al., 2020; Yampolskaya et al., 2015). On the other hand, there was an association between profile membership and gender, with more males belonging to the "Relative low maltreatment" profile and more females to the "Severely abused and neglected" profile. Previous studies had already shown females to present higher rates of sexual abuse (Stoltenborgh et al., 2015; Walker et al., 2004; Wellman, 1993), which was the main type of abuse that characterized this profile. Finally, there were also associations between the maltreatment profiles and the living status of children and adolescents. More than 40% of individuals in the "Relative low maltreatment" profile were living at their homes, while this percentage dropped around the 20% for the other profiles. This could be reflecting severity of maltreatment within each profile.

These numbers justify the need for preventive public policies for the early detection of child maltreatment within the CPS. Although "relatively low", maltreatment occurs in the natural environment that children/adolescents share with their cohabitant, who is usually a relative. In this regard, Maguire-Jack et al. (2018) examined the impact of structural and disaggregated factors to child maltreatment. The authors found intergenerational problems, social isolation and behavioral health problems to have the most impact, and those related to housing were identified as practically irrelevant factors. Therefore, public prevention policies within the community should

consider the macro context in order to establish early detection protocols and effective coordination actions, mainly between the social services and health systems. So far, nearly all general prevention policies focus on cross-cutting factors and special prevention policies on risks. However, these ought to be integrated within each other and not only within the framework of child participation, as some recent research has suggested (Kosher & Ben-Arieh, 2020).

Regarding health- and school-related variables, no statistically significant associations were found. This was a counterintuitive finding since maltreatment has repeatedly been associated to internalizing and externalizing symptoms (Appleyard et al., 2010; Bolger & Patterson, 2001; Heleniak et al., 2016; Manly et al., 2013; Mills et al., 2013; Robinson et al., 2009) which could be reflected in health diagnoses and problems in school that would trigger a need for additional support. Present results may be due to the coarse measures employed in the study. School- and health-related variables present in this work were designed in compliance with the requirement that they were easy to record by the CPS workers and did not imply a self-report of the child/adolescence. Previous studies employed mostly informant-based assessment instruments (for example: Appleyard et al., 2010; Manly et al., 2013), which provide scores based on a wider range of behaviors.

4.1 Implications and Limitations

This study entails some implications for research and practice, as well as some limitations, that ought to be mentioned. Together with the study by Sölva et al. (2020), these make up for all studies developed in Europe that use official records of maltreatment status. Results obtained here support previous evidence by Sölva et al. (2020) in that three main profiles of maltreatment can be distinguished. However, as mentioned earlier in the introduction, instruments used to define the observable indicators play a role in the emerging profiles or latent classes. Solva et al. (2020) employed the same instrument as the one selected for this study, the CTQ-SF. However, in the present study the CTQ-SF was adapted as an informant-based instrument, which, to our knowledge, makes this study the only one employing an informant-based instrument to assess maltreatment. Be that as it may, disparity in latent maltreatment profiles or classes across studies could be due to the instruments used for defining maltreatment. As stated by Rivera et al. (2018), there is a need for unification in the indicators used to assess maltreatment.

A clear implication for practice derived from this study, and others that precede it, relies in that not every child/adolescent with a record of maltreatment should participate in the same intervention programs. In general, other studies have shown that some profiles or classes relate more strongly to certain problems than others (Charak et al., 2018; Pears et al., 2008; Rebbe et al., 2017; Sölva et al., 2020). Different patterns of maltreatment are to be considered when designing intervention programs within the CPS.

More specifically, present results regarding the cumulative nature of maltreatment and its severity suggest modulating public policies by levels of risk, designing specific proposals according to the level of maltreatment risk. An additional important factor to consider is the allocation of public resources, depending on the levels of

institutional care or, on the contrary, dedicated to the community. In line with that suggested by Molnar et al. (2016), public policies ought to develop community programs tailored at individual needs, thus avoiding standardized programs who victimize children and adolescents.

Finally, by focusing on the characteristics associated to maltreatment profiles, the child is no longer at the center. As the aim is to protect children and adolescents and not to expose them, we propose to move the focus of action to the characteristics depicting maltreatment profiles. In this way, the victim remains protected because the study focuses on children and adolescents' conditions and not on the subjects themselves.

A limitation of the present study is the failure to associate latent profiles of maltreatment to health- and school-related variables. This was probably due to the way the measure was recorded, as it was a simple binary indicator and range restriction may be influencing the results (Crocker & Algina, 2006). However, the complexity of the bigger research project this study comes from did not allow recording of more detailed and appropriate measures of health and school outcomes. Some of this complexity comes from the fact that professionals from all areas (prevention, protection, promotion and re-education) of the CPS participated. Finally, the non-probabilistic sampling technique used in this study does not guarantee the generalization of results to the population of reference, and therefore present results may not resemble the real proportions of different maltreatment profiles in the population. In line with this, Little's MCAR test showed that data could not be considered to be missing completely at random. Although the handling data method employed, FIML, works well with data MAR, it is possible that data is not missing at random either in which case results should be taken with caution, given that the estimation of the parameters could potentially be biased. Additionally, results neither generalize to other populations of maltreated children and adolescents that may present different sociodemographic characteristics and thus more studies from different cultural backgrounds are needed, as present results are limited to the geographical and cultural context of the sample employed in the study.

All in all, this study adds to previous evidence of child maltreatment profiles and constitutes one of the two studies carried out in Europe using cases from official records of maltreatment. Given the little number of studies exploring maltreatment classes/profiles in European countries using official records, we believe that additional studies would further understanding of the co-occurrence of different types of maltreatment and its associated outcomes. Moreover, the establishment of three maltreatment profiles provides basis for specific actions within intervention plans and allocating public resources accordingly.

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Author Contribution Study conception was done by José J. Navarro-Pérez. José J. Navarro-Pérez and Irene Fernández worked on the study design. Material preparation, data collection and analysis were performed by Elisabeth Malonda-Vidal and Anna Llorca. The first draft of the manuscript was written by Irene Fernández, Elisabeth Malonda-Vidal and Anna Llorca. All authors reviewed and commented on different versions of the manuscript. All authors read and approved the final manuscript.

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Data Availability Data and materials will be made available by the corresponding author upon reasonable request.

Declarations

Informed Consent The children’s data were all anonymous, and all professionals signed informed consents.

Ethical Approval The study was approved by the Ethical Commission of the Valencian Government (CSV: HYH5NVSA-Y85ZSB11-RML6ZCYX).

Research Involving Human Participants This research complied with APA’s ethical standards.

Competing Interests The authors have no relevant financial or non-financial interests to disclose.

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