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Dismemberment as a Method of Body Disposal in Spanish Forensic Cases

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Abstract: This study provides an overview of victim and offender data, the cause and manner of death, the dismemberment type, the post-dismemberment alteration, and the forensic investigation, for 35 Spanish forensic cases. The main aim of this study was to perform a retrospective analysis of dismemberment and body part alteration in Spain since 1990, in particular relating to burning. The sample was selected from a Spanish national database on criminal records (CENDOJ). Official court records were examined for 96 variables, which were analysed through non-metric multidimensional scaling analysis (nMDS). The results obtained revealed that the number of dismemberment cases between 1990 and 2016 totalled 35 (amounting to a total of 40 bodies) with an incidence of 0.29% of the total number of homicide cases in the database. Most of the aggressors were Spanish adult males, and the victims were adult females of foreign nationality. The most commonly employed tool used to kill and dismember was the knife. A total of 15.00% of the 40 bodies were further altered by fire. It was concluded that dismemberment and other postmortem actions contributed to complicating the forensic investigation and hindering the identification of the deceased.

Keywords: dismemberment; mutilation; forensic science; forensic anthropology; Spain

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Citation: Mata-Tutor, P.; Villoria-Rojas, C.; Benito-Sánchez, M.; Marquez-Grant, N. Dismemberment as a Method of Body Disposal in Spanish Forensic Cases. *Forensic Sci.* **2022**, *2*, 492–504. https://doi.org/10.3390/forensicsci2030036

Academic Editors: Francisca Alves Cardoso, Pier Matteo Barone and Ricardo Dinis-Oliveira

Received: 13 June 2022
Accepted: 6 July 2022
Published: 11 July 2022

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1. Introduction

In homicides cases, the offender(s) often attempt(s) to hide and destroy evidence. Acts such as burying the body or disposing of the corpse in the water, contribute to concealing the identity of the deceased as well as the perpetrators. There are several reasons to alter the body after death: to destroy the evidence of the crime, to facilitate the transportation of the body, to prevent the identification of the deceased, and to hide the proof of murder [1–5]. One well-known method of cadaveric modification is dismemberment, albeit it is more common in armed conflicts [6–9] than in individual domestic cases [10–14].

Dismemberment is defined as the separation of the limbs or organs using a sharp force mechanism or a blunt force mechanism with a sharp tool [8], and mutilation as the damage to a body part, in the form of removal or disfigurement, including activities such as evisceration, castration or flaying [15,16]. These actions, often used interchangeably [15], can be classified according to the mode of dismemberment, pattern of injuries and tool used, and offender behaviour. With regard to the dismemberment mode, this can be classified into *localised*, in which only certain body areas used in identification, such as the head or hands, are removed; and *generalised*, when the body is cut into several parts [17,18]. Regarding the pattern of injuries and the tool used [19], it can be classified as *disarticulation* around the joints, or as *transection* of the bone through chopping or sawing. Lastly, the behaviour of the perpetrator can be *aggressive*, *defensive*, *offensive*, *necromanic*, or related to *communication* [20,21].

The defensive behaviour is the most frequent in Europe [2,13,22–26], and the main aim of the offender(s) is to cover up the evidence of the crime and to prevent the identification of the victim. Aggressive mutilation is the second most common type of be-

haviour [13,22–24,26], and it usually involves overkill, soft tissue mutilation and corpse desecration [13,16,26]. Communication dismemberment is frequent in Latin American countries [7,8], and body part removal is used as a method of intimidation between rival criminal bands, rather than to conceal the crime. Necromanic mutilation and cannibalism are quite rare worldwide [27–29].

Dismemberment facilitates the transportation and removal of the body, making the scattering or deposition of the remains easier [2,30]. The identification of the deceased becomes hindered, since decapitation and sectioning of the hands are common acts in defensive dismemberments [20,22], and these anatomical regions are not always recovered [17,23]. It may also hinder the determination of the cause and manner of death [5,31]. The effects of penetrating trauma and evisceration on the rate of decomposition have been studied by several authors [32–34]. According to Mann et al. [32], trauma influences the decomposition rate, speeding up the process. In contrast, other authors observed that trauma affects the pattern of decomposition but not the rate [33,34]. Either way, dismemberment complicates the estimation of the post-mortem interval, as the visual evaluation is less accurate when an incomplete cadaver is in an advanced state of decomposition [35,36]. Moreover, previous retrospective studies of forensic reports occasionally mention further concealment methods or alterations to the body by the perpetrators after the dismemberment, such as acid [19] and fire [2,26,37–39]. Fire is by far the most common agent used and its effects have been studied in depth [4,40–43], although less is known about other taphonomic alterations [44,45]. A pilot statistical study of 10 forensic cases in Spain revealed that two out of 13 bodies were burnt following dismemberment [26]. This behaviour has also been documented by previous authors in other countries including Italy [38], Poland [2,46], England [37] and South Korea [39].

Apart from a pilot analysis [26], no retrospective analysis of dismemberment has been undertaken for Spanish cases. Thus, this study aims to provide an overview of the victim and offender data, the cause and manner of death, the dismemberment type, the post-dismemberment alteration, and the forensic investigation for 35 cases. To this end, the study has calculated the prevalence of dismemberment cases in view of the total intentional homicide cases in Spain and their distribution according to the different Autonomous Regions (Comunidades Autónomas). In addition, a nonmetric multidimensional scaling analysis to analyse the inter-trait correlation between all variables has been undertaken.

2. Materials and Methods

2.1. Database

Data were extracted from the *Consejo General del Poder Judicial Español*, in particular from the Centre for Judicial Documentation (CENDOJ in the Spanish acronym). This is a nationwide database of official court records of criminal cases that have passed through court, which includes standardised information from Spanish criminal cases. Ongoing investigations and current trials could not be included in the present study because they were not as yet included in the CENDOJ database.

This analysis searched for dismemberment cases that occurred between 1990 and 2016 using the following search labels: "descuartizar [quartening]", "desmembrar/desmebrado/desmembramiento [dismember/dismembered/dismemberment]" and "profanación de cadaveres [corpse desecration]". Over 100 cases were reviewed and 35 were selected based on the following criteria: the crime was classified as murder, manslaughter, or homicide, with intentional body dismemberment of the victim. Unsolved cases, accidental deaths, suicides and threats (but not fatalities) were excluded. The criminal reports and court records were analysed to obtain 96 variables divided as:

- A total of 20 variables regarding the victim and offender data following those used by Almond et al. [22], Häkkänen-Nyholm et al. [25] Petreca et al. [16], Sea and Beauregard [39], and Wilke-Schalhorst et al. [23];

- A total of 35 variables regarding the cause and manner of death and dismemberment based on Almond et al. [22], Cunha et al. [47] Sea and Beauregard [39], Wilke-Schalhorst et al. [23], Vásquez Guarín et al. [9] and Vásquez Guarín [48];
- A total of 11 variables regarding the post-dismemberment alteration of the body as employed by Sea and Beauregard [39];
- A total of 13 variables regarding the crime organisation and planning, described in the study undertaken by Petreca et al. [16];
- A total of 17 variables regarding the state of preservation of the body and the medicolegal investigation obtained from the court records, following the definitions found in Byers [49] and the retrospective study made by Konopka et al. [2]. The dismemberment type was assessed following the definitions proposed by Black et al. [20].

The variables taken for each selected case were used to create a database in Excel. The intentional homicides that occurred in Spain during the period 1990–2016 were obtained from DatosMacro, a nationwide database of official crime statistics. The prevalence of dismemberment was calculated by dividing the number of cases of the latter by the total number of solved homicide cases.

2.2. Statistical Analysis

A descriptive analysis was employed for all variables using the software SPSS v 25.0 for Windows 10 (SPSS Inc., Chicago, IL, USA) and counts and frequencies were obtained. For the nonmetric multidimensional scaling (nMDS) analysis, categorical variables were transformed into dichotomous (yes (1) or no (0)). Psychological variables related to the victim and offender were excluded, since the psychological aspect was considered beyond the scope of this paper, except for the categories "*Violent behaviour*" and "*Anatomy knowledge*". Variables with a low frequency or that were already included as part of another variable were also excluded. The exceptions were deemed relevant within a forensic anthropology context and had been used in previous retrospective studies [16,17,22,23]. In total, 60 variables were chosen. Following the methodology proposed by Pecino-Latorre et al. [50], the R statistics software (package "smacof") was employed. This test was used to explore the association between variables as distance in a bidimensional map, providing an overall descriptive view of the inter-variable correlation. Following this, the Kruskal stress I index was used to assess the models' fit: 0 (perfect fit)–1 (poor fit) [51].

3. Results

3.1. Descriptive Analysis

The first case of dismemberment reported was in 1993, and the last case registered in the CENDOJ database at the time of this analysis was in 2016 (Figure 1). Dismemberment (35 cases) had an incidence of 0.29% of the total cases (n = 12,013) of intentional homicide between 1990 and 2016. The cases were distributed somewhat evenly throughout Spain, although the regions with more cases were Andalucía (South of Spain) and Catalonia (North-east of Spain), with six and nine dismemberment cases, respectively (Figure 2).

Tables 1 and 2 present all the variables from the victim and offender data. The total number of victims was 40 and the number of convicted offenders was 41, because of the 35 cases, there were three with multiple victims, and five with multiple aggressors. As observed in the tables, most of the victims were adult (67.50%) and female (60.00%) of foreign origin (55.00%); whilst the majority of offenders were Spanish (65.85%) adult (68.29%) males (87.80%). Six out of 11 perpetrators had some knowledge of anatomy due to their occupation (e.g., butcher) or due to their educational background.

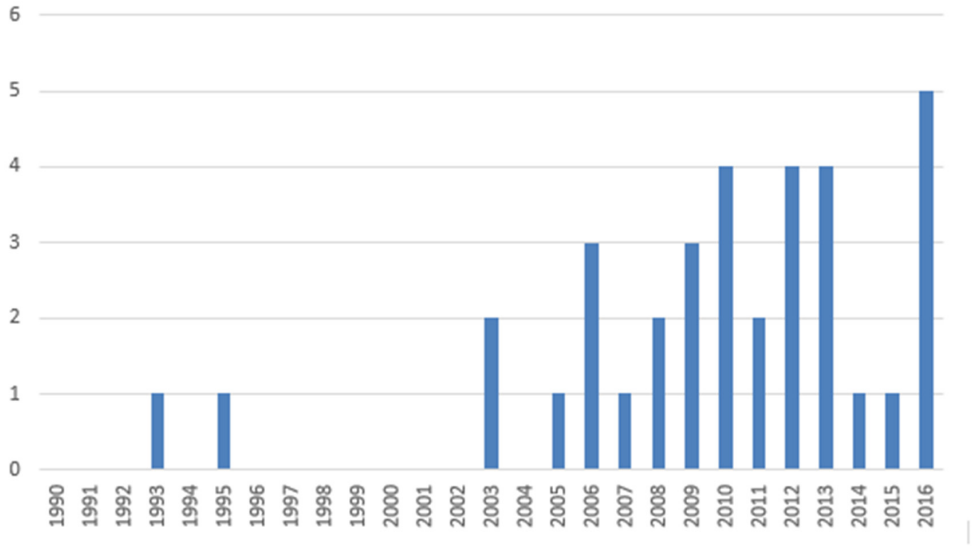


Figure 1. Number of cases per year (n = 35). 1993: first sentenced case; 2016: last sentenced case.

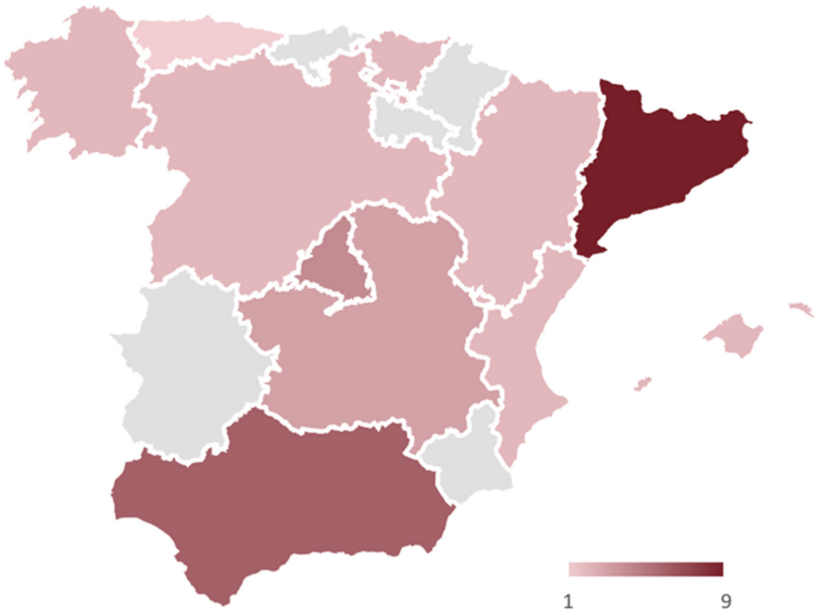


Figure 2. Number of cases per region (n = 35).

Table 1. Victims' data.

Variables	R Code	*n*	Total	Percentage
Cases with one victim	-	32	35	91.43%
Cases with multiple victims	-	3	35	8.57%
Demographic profile				
Minor (<19)	-	2	40	5.00%
Young adult (20–29)	-	5	40	12.50%
Adult (30–59)	-	27	40	67.50%
Mature (60+)	-	4	40	10.00%
Female	-	24	40	60.00%
Male	-	16	40	40.00%
Spanish victim	-	18	40	45.00%

Table 2. Offenders' data.

Variables	R Code	*n*	Total	Percentage
Cases with one offender	-	30	35	85.71%
Cases with multiple offenders	-	5	35	14.29%
Demographic profile				
Minor (<19)	-	2	41	4.88%
Young adult (20–29)	-	7	41	17.07%
Adult (30–59)	-	28	41	68.29%
Mature (60+)	-	2	41	4.88%
Female	-	5	41	12.20%
Male	-	36	41	87.80%
Spanish offender	-	27	41	65.85%
Violent behaviour	VIOLENT	20	41	48.78%
Anatomy knowledge	ANATOMY	16	41	39.02%

Table 3 presents the descriptive statistics of all variables concerning the cause and manner of death. It can be observed that hypovolemic shock caused by severe loss of blood as a result of stabbing—either to multiple parts of the body (27.50%) or specifically to the throat (22.50%)—was the most frequent cause of death. The knife was the most employed tool type (47.50%).

Table 3. Cause and manner of death.

Variables	R Code	*n*	Total	Percentage
Geographic area				
Urban area	URBAN	20	35	57.14%
Rural area	RURAL	15	35	42.86%
Cause of death				
Hypovolemic shock	HVS	11	40	27.50%
Cutthroat hypovolemic shock	CUT_THROAT	9	40	22.50%
Head trauma	HT	13	40	32.50%
Suffocation	SUFFOCATION	5	40	12.50%
Other cause	-	1	40	2.50%
Tool or trauma mechanism				
Knife	SHARP	19	40	47.50%
Chopping tool	-	1	40	2.50%
Saw	-	1	40	2.50%
Blunt	BLUNT	5	40	12.50%
No tool was used/Manual	MANUAL	5	40	12.50%
Other trauma mechanism	-	8	40	20.00%

Table 4 presents the descriptive statistics of all variables concerning the dismemberment of the victims. In most cases, one tool was used to dismember the victim in 57.50% of cases. This was divided primarily by dismemberment caused by knives (32.50%), followed by saws (17.50%). If two or more tools or weapons were employed, the combination of knife and saw was the most common (15.00%). Beheading and the dismemberment of the limbs were frequent variables, whereas mutilation of the face and/or breasts was rare.

Table 5 presents the destructive post-dismemberment agents leading to further alteration of the cadaver. From a total of 40 bodies, 11 were significantly altered after dismemberment (27.50%), and it can be observed that fire was the taphonomic agent more frequently employed (15.00%).

Table 4. Dismemberment variables.

Variables	R Code	*n*	Total	Percentage
Tool				
Knife	D_KNIFE	25	40	62.50%
Chopping tool	D_CHOP	11	40	27.50%
Saw	D_SAW	19	40	47.50%
One tool	ONE_TOOL	23	40	57.50%
Knife only	-	13	40	32.50%
Chop only	-	3	40	7.50%
Saw only	-	7	40	17.50%
Multiple tools	TOOL_COMB	15	40	37.50%
Knife and Chop	-	3	40	7.50%
Knife and Saw	-	6	40	15.00%
Chop and Saw	-	2	40	5.00%
All classes	-	4	40	10.00%
Beheading	BEHEADING	29	40	72.50%
Dismemberment				
Dismember limbs	LIMBS_CUT	34	40	85.00%
Torso mutilation	TORSO_CUT	11	40	27.50%
Dismember hands	HANDS_CUT	13	40	32.50%
Soft tissue mutilation	SOFT_TISSUE_MUT	11	40	27.50%
Face mutilation	FACE_MUT	2	40	5.00%
Breast mutilation	BREAST_MUT	2	40	5.00%
Genital mutilation	GENITAL_MUT	5	40	12.50%
Evisceration	EVISCERATION	6	40	15.00%
Intentional bleeding of the cadaver	BLEED_CADAVER	3	40	7.50%

Table 5. Post-dismemberment alteration.

Variables	R Code	*n*	Total	Percentage
Not altered	-	29	40	72.50%
Altered	BP_ALTERATION	11	40	27.50%
Identification regions	BP_ID	5	40	45.50%
Random regions	BP_RANDOM	6	40	54.50%
With fire	BP_FIRE	6	40	15.00%
Alcohol	-	1	40	2.50%
Gasoline	-	2	40	5.00%
Unknown flammable material	-	3	40	7.50%
With chemicals	BP_CHEMICALS	3	40	7.50%
Quicklime	-	2	40	5.00%
Drain cleaner	-	1	40	2.50%
Manually	BP_MANUAL	2	40	5.00%

Table 6 presents the descriptive statistics of all variables concerning the organisation of the crime. Cleaning of the crime scene, dispersal of the materials used, and collection and dispersal of the body parts were common behaviours ($\geq$60.00%).

The majority of the 40 dismembered bodies were found either complete (32.50%) or missing only one or two anatomical regions (42.50%), such as the head or a limb, and were in a documented state of decomposition (42.50%) (Table 7). It was observed that 24 out of the 41 offenders (58.54%) were tried for corpse desecration. Regarding the type of dismemberment, 77.14% (27/35) of the cases were defensive.

Table 6. Organization.

Variables	R Code	*n*	Total	Percentage
Premeditation	PREMEDITATION	8	35	22.86%
Material acquisition by the offender				
Before the murder	MATERIAL_BEFORE	5	35	14.29%
After the murder	MATERIAL_AFTER	13	35	37.14%
Crime scene cleaning	CLEANING	21	35	60.00%
Dispersal of material	PB_DISPERSION	21	35	60.00%
Body parts collection	BP_COLLECTION	31	35	88.57%
No dispersal	BP_INDOORS	9	35	25.71%
Body parts dispersal	BP_DISPERSAL	26	35	74.29%
In a body of water	BP_WATER	6	35	17.14%
In a forest area	BP_FOREST	3	35	8.57%
In a container	BP_CONTAINER	7	35	20.00%
In multiple places	BP_MULTIPLE_PLACES	8	35	22.86%
In other sites	-	2	35	5.71%

Table 7. Forensic investigation.

Variables	R Code	*n*	Total	Percentage
Body parts found				
Whole cadaver found	BP_COMPLETE	13	40	32.50%
>50% of the cadaver found	BP_MORE_50	17	40	42.50%
<50% of the cadaver found	BP_LESS_50	6	40	15.00%
Biological traces without body	BP_TRACES	3	40	7.50%
No body no traces	BP_NO_BODY	1	40	2.50%
Decomposition state				
Early decomposition state	BP_EARLY	7	40	17.50%
Late decomposition state	BP_LATE	10	40	25.00%
No body	-	4	40	10.00%
Non-observable	BP_NON_OBSERVABLE	4	40	10.00%
Forensic identification				
Visual ID	ID_VISUAL	12	40	30.00%
Fingerprinting ID	ID_FINGERPRINTS	2	40	5.00%
DNA ID	ID_DNA	7	40	17.50%
ID through offender's testimony	ID_TESTIMONY	3	40	7.50%
Offender tried for corpse desecration	CORPSE_DESECRATION	24	41	58.54%
Dismemberment type				
Defensive	DEFENSIVE	27	35	77.14%
Aggressive	AGGRESSIVE	5	35	14.29%
Mixed type	MIX	3	35	8.57%

3.2. Multidimensional Scaling

A Stress-I index of 0.309 for the model of fit of the bidimensional map was obtained. According to Pecino-Latorre et al. and references therein [50], it can be considered an acceptable result since the representation of the variables agreed with the descriptive statistics and allowed a valid interpretation of the data. Figure 3 shows the bidimensional nMDS map. Each point corresponds to one of the 60 variables chosen for the present study and both dimensions show the similarity between variables. It can be observed that *defensive* and *aggressive* subtypes are in opposite areas of the bidimensional map.

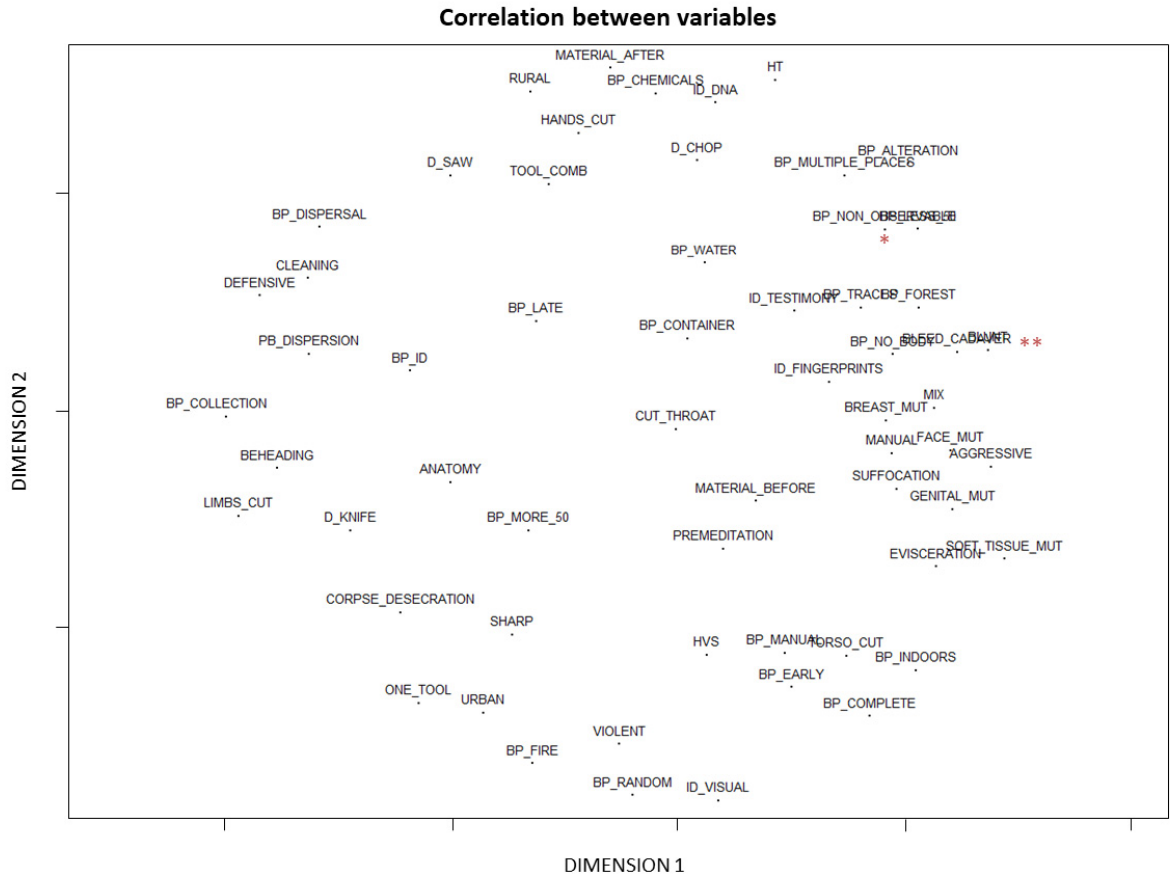


Figure 3. Nonmetric multidimensional scaling (nMDS) map. Correlation between variables. *: BP_NON_OBSERVABLE and BP_LESS_50; **: BP_NO_BODY, BLEED_CADAVER and BLUNT.

4. Discussion

4.1. Ratio of Dismemberment Cases

This study aimed to analyse the dismemberment cases in Spain between 1990 and 2016. The vast majority of the cases occurred from 2002 onwards, reaching a peak in 2010 (Figure 1). This could be explained due to an under-registration of mutilation cases before the digitalization of the criminal database [52], so it is possible that not all cases that occurred during the 1990–2000 period were included. Adams et al. [17] reported a high number of dismemberment cases in New York City (1996–2017) compared to other locations, with an average of 2.50 cases per year. In the present study, an incidence of 0.29% (1990–2016) was obtained from the total number of homicides, with an average of 1.35 dismemberment cases during the 26-year period against an average of 462 homicides per year. Dismemberment was slightly more frequent in urban areas (57.14%) than in rural areas. These results agree with the conclusions reached by Adams et al. [17] for New York City in the U.S.A., and by Vásquez Guarín et al. [9] for Medellín in Colombia, and seems to correspond with regions where high population density complicates the disposal of a body, so that offenders are more likely to perform amputations to ease transportation and removal of the body. It can be observed in Figure 2 that Catalonia was the region where most of the cases had occurred; Catalonia (9 cases) and Madrid (4 cases) are densely populated, and Andalucía (6 cases) is the second most populated region in Spain, hence the high incidence of dismemberments in these territories compared with others.

4.2. Victim and Offender Data

In accordance with previous statistical studies performed on European [2,13,22,23], American [7–9,16,17] and Asian populations [39], and with the results obtained in a pilot

study of 10 Spanish cases [26], the offenders were predominantly male (87.80%) and the victims female (60.00%). This is contrary to communication dismemberments, in which victim and aggressor are usually males [53–56]. It is worth mentioning that all cases with multiple offenders, except for one case, consisted of a male and a female. In these situations, the male tended to be the active perpetrator of the homicide and dismemberment of the body, while the female played a more indirect role. According to Wilke-Schalhorst et al. [23] in a study of 51 dismemberments between 1959 and 2016 in Hamburg, Germany, out of the 35 known perpetrators, 6 (7.14%) were female. Almond et al. [22] reported only 3 (5.77%) female offenders out of 52 cases in the United Kingdom (years 1975–2016). These results are consistent with a low (4/41, 12.20%) participation of female offenders analysed here for Spain.

4.3. Cause and Manner of Death

The ratio of weapons used to kill, and the ratio of implements employed for the dismemberment varied greatly (Figure 4). Knives maintained a much higher ratio, unlike the frequency observed for saws and chopping tools, which were often used during the dismemberment but not to kill. Saws were used for dismemberment and mutilation in 19 occasions (47.50%). This was expected as chopping tools such as axes and saws are considered the most efficient according to the literature [1,11,19]. This study, however, also demonstrates that knives were also used frequently, in 25 cases in total (62.50%). This outcome differed from the results reported by Ross et al. [1] in which saws were the predominant tool. Nonetheless, the Spanish data does add support to previous work by Wilke-Schalhorst et al. [23], Konopka et al. [2], and Wirth and Schmeling [56], who stated that knives were often employed to dismember; and certainly, were not infrequent as also suggested by Porta et al. [12]. Thus, the results suggest that in Spain, knives have been the preferred tool to kill and dismember in criminal mutilation cases, whether used as a sole weapon or in combination with a saw.

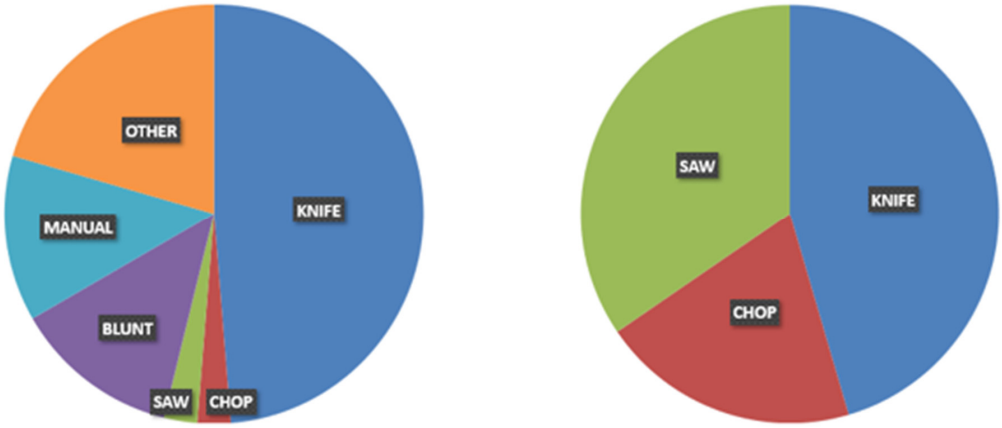


Figure 4. Ratio comparison of tools used during murder (**left**) and dismemberment (**right**). KNIFE: knives or other cutting tools; CHOP: chopping tools (e.g., axe or hatchet); SAW: electric and manual saws; BLUNT: blunt tools (e.g., hammer); MANUAL: no tools were used (e.g., suffocation); OTHER: other trauma mechanisms (e.g., fall).

4.4. Dismemberment

According to the literature, both offensive and defensive dismemberments involve decapitation [1,22,23], and bodies which have been divided only in two parts have been most likely beheaded [17]. Adams et al. [17] registered 20 cases out of 30 (66.66%) where there was removal of the head, and Konopka et al. [2] reported 21 out of 23 (91.30%). Our results are in agreement with the literature, where decapitation appears to have occurred in 72.50% of the total cases. Several authors [6,22,23,38,39] have documented mutilation performed on faces, genitals and the chest, as well as evisceration. For instance,

Almond et al. [22] reported a ratio of 17.2% for breast mutilation, 10.3% for face mutilation, and 8.6% for genital mutilation, for the U.K., roughly twice the values obtained in this study. These variables were clustered together in the bidimensional map along with the *aggressive* variable in the upper left part of the figure, which suggests an association (Figure 4). These results agree with the definitions of aggressive dismemberment described by Black et al. [20] and Ross et al. [1], which involves soft tissue mutilation to desecrate the memory of the deceased.

4.5. Post-Dismemberment Alteration

After the dismemberment, a total of 11 (27.50%) bodies were further altered, and chemical products and fire were the taphonomic agents used by perpetrators to ensure, in particular, the destruction of identifying features and any other evidence. Burning and spilling of chemicals on the body were documented during body mutilation in South Korean homicides (1995–2011) [39]. Fire was used in 41.5% of the 65 cadavers, and chemicals on 4.6%. In the present study, the use of fire was much lower than the value reported by Sea and Beauregard [39], but the use of chemicals products was slightly higher (7.50%). The use of chemicals after dismemberment has also been documented by other authors [2,19]. In a case examined by Rainwater [19], the perpetrator put remnants of tissue and fat inside bottles of bleach, muriatic acid and drain cleaner. Whilst burning has been used to prevent identification by damaging specific regions such as the face and fingers [39], this was not always the purpose of the offenders in the present study, and neither on the cases analysed by Konopka et al. [2]. Frequently, the perpetrators attempted to dispose of the whole body, rather than destroying only specific parts especially those that can aid the identification of the deceased (e.g., face, hands), as has been reported by Roberts and Baldry in a domestic case in England [37]. Likewise, Konopka et al. [2] documented five cases in which the aggressor burnt all the remains after dismemberment. Therefore, it was confirmed that fire is the taphonomic agent most often used to this effect in Spain –whether to conceal body regions used in the identification of the deceased or to attempt to destroy the whole body and any associated evidence, as is also observed in other published cases [2,26,37–39].

4.6. Organisation

Petreca et al. [16] differentiate between organised and disorganised dismemberments. Organised includes premeditation, material acquisition, cleanliness, knowledge of anatomy, and dispersal and concealment of body parts and personal belongings. Disorganised dismemberments are defined as careless and spontaneous, with no removal of incriminating evidence. The nMDS analysis revealed that organised traits were clustered together along with the defensive subtype in the right part of the bidimensional map (Figure 4). Furthermore, the variable *destruction of identifying regions* (BP_ID) was grouped with these organised traits. The localised destruction of body regions for victim identification is a defensive subtype characteristic [1,13,22], thus, confirming Petreca et al. [16] and Almond et al. [22] results; and Black et al. [20], Ross et al.'s [1] and Cunha's [47] descriptions of defensive dismemberment.

4.7. Forensic Investigation

Most bodies were found incomplete (42.50%), where one anatomical region was missing, such as the head or a limb. According to Di Nunno et al. [5], dismemberment cutmarks are susceptible to be mistaken with perimortem injury, and in cases where it is unknown if death occurred as a result of decapitation or whether decapitation occurred as an alteration after death (e.g., dismemberment), the determination of the cause and manner of death is challenging if there is no other evidence to assist. Additionally, 25.00% of the bodies in this current study were in an advanced stage of decomposition and 10.00% had extensive soft tissue damage (e.g., carbonisation). Sanabria-Medina and Restrepo [8] concluded that the possibility of trauma to the soft tissue prior to the dismemberment should be considered.

In this systematic review of cases, it has been thought that the post-mortem alteration to the cadaver was most likely performed to hide and destroy the incriminating evidence. The offenders either attempted this by scattering the body parts, displacing personal belongings, destroying anatomical regions, which could help with the identification of the deceased, or all of the above. The pattern of behaviour is consistent with a defensive subtype [1,13,16,20,22], which is the most common subtype in Europe [2,13,22–25] and 77.14% of the cases considered in this present retrospective analysis. However, previous studies in Panamá [7,53] and Colombia [6,8,9,48,54] have indicated that often the aim of the perpetrator is to send or communicate a message, rather than to conceal the identification and prevent the discovery of the body. Therefore, while the main motivation is masking or concealing the evidence for murder and to ease the transportation of the body [2,30], terrorizing and elaborating a statement [7], or simply wanting to desecrate the memory of the deceased [16,29,39] may be other valid reasons to dismember a body.

5. Conclusions

This study has provided some valid results which may be of interest to investigators. Considerations of some of the limitations of this study should be taken into account. Firstly, unsolved cases and cases that were not yet included in the CENDOJ database could not be accounted for. Secondly, the patterns of dismemberment and rates may have differed from 2016 to the present day. Likewise, not all information was added to the court records, such as the full autopsy report or the methodology employed to confirm the identification of the deceased. The relationship between victim and offender, their mental health state and other behavioural factors were considered to be beyond the remit of this paper. A multidisciplinary approach combining forensic science and behavioural science methodology is recommended for future analyses.

This work constitutes the first retrospective study on dismemberment and mutilation in Spain, in addition to a 10-case pilot analysis performed by some of the authors [26]. It was established that the number of dismemberment cases in Spain in 26 years (1990–2016) was 35, with an incidence of 0.29% of the total cases of intentional homicide. This equates to an average of 1.35 dismemberment cases per year. Moreover, the cases were distributed evenly, but it was observed that in the most populated Autonomous Regions of Spain, the ratio of dismemberment was higher. Most of the aggressors were Spanish adult males, and the victims were adult females of foreign nationality. Knives were the most employed implements for homicide and dismemberment, and 77.17% of the total cases were labelled as defensive. All the results are in agreement with other European studies.

The forensic reconstruction of the events and the initial identification is challenging when a body has been dismembered; thus, observing common patterns in methods of cadaveric modification from different countries can provide empirical evidence which can be used in future casework where post-mortem alteration of the body is suspected.

Author Contributions: Conceptualization: P.M.-T.; Investigation: P.M.-T. and C.V.-R.; Software: P.M.-T. and C.V.-R.; Data analysis and Interpretation: P.M.-T. and C.V.-R.; Writing—Original Draft: P.M.-T.; Writing—Editing: C.V.-R. and N.M.-G.; Supervision: N.M.-G. and M.B.-S. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: Not applicable.

Acknowledgments: We would like to thank Daniel García Rubio for his assistance in designing the tables and figures and to all the anonymous reviewers that have helped polish this manuscript.

Conflicts of Interest: The authors have no conflict of interest to declare.

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Dismemberment as a method of body disposal in Spanish forensic cases

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2022-07-11
MDPI
https://doi.org/10.3390/forensicsci2030036
Mata-Tutor P, Villoria-Rojas C, Benito-Sánchez M, Marquez-Grant N. (2022) Dismemberment as a method of body disposal in Spanish forensic cases. Forensic Sciences, Volume 2, Issue 3, July 2022, pp. 492-504

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