

Empirical Articles

An Analysis of Suicide Attempts in Jaén Province (Andalusia-Spain)

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Abstract

Aim: Suicide is the leading cause of non-accidental death in Spain across both sexes and all age groups; however, data on suicide attempts by region are heterogeneous and little reported. This study aimed to examine the socio-demographic and epidemiological variables most strongly related to suicide attempts in Jaén province.

Methods: Data on people who had attempted suicide over a 26-month period (2009–2011) were collected from the emergency departments of two hospitals via their electronic medical record systems specific to the Autonomous Community of Andalusia (Spain). Descriptive and frequency statistics were obtained and the relationship among variables was examined.

Results: Suicide attempters were aged 24 to 53 years, being primarily women (65.25%). The most frequent suicide method was medication ingestion (85.55%); thus, ingestion of toxic substances has become the preferred method among women (LR(3) = 14.731; $p = .02$). The hospitals discharged the patients (46.44%) or referred them to mental health services in the area (20.08%) following a suicide attempt. There were more hospital discharges when the attempt involved ingestion of toxic substances or self-harm (LR(12) = 20.603; $p = .05$), and in winter and spring (LR(12) = 69.772; $p < .001$).

Conclusion: The need for emergency departments to have prevention and intervention procedures in place, specifically designed for suicide attempts and at-risk individuals, is discussed.

Keywords: epidemiology, suicide attempt, incident, emergency departments, hospital

Psychology, Community & Health, 2014, Vol. 3(3), 1–99, doi:10.5964/pch.v3i3.102

Received: 2014-03-05. Accepted: 2014-07-07. Published (VoR): 2014-11-28.

Handling Editor: Sofia von Humboldt, Psychology & Health Research Unit (UIPES); ISPA - Instituto Universitário Lisbon, Portugal

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Introduction

Suicide is one of the three leading causes of non-accidental death worldwide among people aged 25 to 44 years, and the second main cause of non-accidental death in the 10 to 24 age group (World Health Organization [WHO], 2010a, 2010b).

Regarding the European Union, the latest published figures show significant differences among member states (European Statistical Office of the European Commission [Eurostat], 2009), with northern European countries being the most affected, and Mediterranean countries the least affected. That said, all display a trend towards lower suicide rates, except Ireland and Spain where these rates have remained stable every year (Chishti, Stone, Corcoran, Williamson, & Petridou, 2003; Eurostat, 2009; Instituto Nacional de Estadística [INE], 2006, 2008; Mladovsky et al., 2009; Perry et al., 2012; Ruiz-Pérez & Olry de Labry-Lima, 2006).

The most recent statistics on death by suicide in Spain (INE, 2010b) show that a decline in mortality from road traffic accidents (2327 fatalities) continues to place suicide as the leading external cause of death, accounting for 3145 deaths (2456 men and 689 women), a similar number to that from previous years (INE, 2006, 2008, 2009). Breaking this down into autonomous communities, current suicide mortality rates, according to population rate are, in descending order, Asturias, Galicia, Balearic Islands, Castile and León, and Andalusia (Table 1). This order differs from previous years (INE, 2009), where Andalusia led the national statistics (Sánchez-Teruel, 2012).

Table 1

Total Number of Deaths by Suicide for the Top Five Spanish Autonomous Communities (2010)

Autonomous Community	Total deaths by suicide	Population	%	Men	Women
Asturias	149	1,055,557	0.01411	111	38
Galicia	275	2,736,636	0.01004	202	73
Balearic Islands	96	1,088,514	0.00881	75	21
Castile and León	216	2,491,420	0.00866	172	44
Andalusia	685	8,256,297	0.00829	537	148

Note. Source: Our own compilation of INE data (2010a).

There is, however, little reported data on suicide attempts, although some organizations (International Association for Suicide Prevention, 2010; WHO, 2010b, 2012) and authors (Boeninger, Masyn, Feldman, & Conger, 2010; Nakagawa et al., 2009; Vázquez-Lima, Álvarez-Rodríguez, López-Rivadulla Lamas, Cruz-Landeira, & Abellás-Álvarez, 2012) estimate them to be between 10, 20 or even 40 times more frequent than completed suicides, leading to significant financial and personal adverse effects (Bobes-García, Giner-Ubago, & Saiz-Ruiz, 2011).

Some studies (Baca-García et al., 2004, 2010) have found that emergency department professionals fail to take into consideration certain socio-demographic (sex, age, origin) and epidemiological variables (active mental disorders, prior attempts, methods, date and time of attempt) when assessing and deciding upon care following a suicide attempt. In response to this, some health authorities (Jiménez-Pietropaolo et al., 2011; Ministerio de Sanidad, Política Social e Igualdad, 2011) have published effective clinical practice guidelines based on the evidence against attempted suicide. However, these recommendations are yet to be adopted by emergency department professionals in some countries (Huisman, Kerkhof, & Robben, 2011), Spain included (Miret et al., 2010). In the case of Spain, the socio-demographic and epidemiological variables by region and healthcare district are highly heterogeneous in nature, making it difficult to establish a standardized plan of action (González-Navarro et al., 2012; Jiménez-Treviño et al., 2012).

Consequently, the aim of this study was to detect and describe the socio-demographic and epidemiological variables of people who attempted suicide between 2009 and 2011 (26-month period) across two healthcare districts in Jaén province, via the collection of data kept by the hospitals' emergency departments.

Methods

Epidemiological and clinical data were collected on all people who were admitted to two hospitals in Jaén province by their respective emergency departments, and who met the inclusion criteria outlined in the Participants section. To detect the existence of relationships among socio-demographic and nominal epidemiological variables, the likelihood ratio was calculated. The level of significance required to perform these tests was set at $p < .05$. A fre-

quency count at intervals was used on the remaining variables. Statistical analysis of the data was conducted using SPSS version 19.0.

Participants

The sample was taken from the emergency departments of the Hospital Neurotraumatológico de Jaén and the Hospital San Agustín in Linares (Jaén).

The inclusion criteria of this study were as follows: men or women aged 18 to 94 years, admitted to the respective emergency departments between 1 November 2009 and 31 December 2011, and with a primary diagnosis of "suicidal intent", "suicidal behaviour" or "suicide attempt".

There were 463 suicide attempts carried out by 400 people during this period and among the two hospitals belonging to the two health districts in Jaén (Table 2). Of these 400 patients, 261 were female (65.25%) aged 14 to 94 years ($M = 39.21$; $SD = 15.74$; 95% CI [37.30, 41.13]), and 139 were male (34.75%) aged 14 to 84 years ($M = 39.50$; $SD = 14.30$; 95% CI [37.10, 41.90]). A total of 38 of the 400 people included in this study had attempted suicide on more than one occasion.

Table 2

Data on Number of Inhabitants and Suicide Attempts for Both Health Districts

Mean population of both health districts during research period	Number of people admitted for attempted suicide during research period	% of suicide attempts on the mean population during research period
280,987	400	0.142%

Note. Source: Our own compilation based on the census total for each town per health district (Instituto de Estadística de Andalucía [IEA], 2010).

Material

This study was carried out in collaboration with healthcare personnel (a clinical psychologist and two nurses), whose role it was to gather data about suicide attempts. This information was retrieved from the patients' mental health records, stored in the hospitals' electronic systems, using DIRAYA, a program that has been implemented across Andalusia's health service, including the emergency departments of the two hospitals located in Jaén province. This program is an integrated management information system for the healthcare sector. It has numerous advantages, not only for healthcare professionals but also for research staff, one of the main advantages being that it aims to replace paper-based medical records with electronic ones related to health and illness processes in digital format, guaranteeing interoperable data transmission and complete confidentiality.

Data Protection Law (LOPD) 15/1999 concerning the protection of personal data (December 13, 1999) was adhered to at all times. A collaborating healthcare professional removed all patients' personal details (forename(s), surname(s), national identity card number (DNI), address and contact telephone number), assigning each record a number to prevent any information on the person's identity from being known.

Procedure

Participation requests were sent out to every public hospital in Jaén province, thus covering the four health districts, which make up the province according to the Ministry of Health of the Regional Government of Andalusia ([Consejería de Salud, 2010](#)).

Only two hospitals agreed to take part in the study: Hospital Neurotraumatológico de Jaén, which serves Jaén District (Mancha Real, Mengíbar, Jaén, Cambil, Huelma, and Torredelcampo); and the hospital San Agustín in Linares, which takes in North Jaén (Bailén, La Carolina, Linares, and Santisteban del Puerto).

A collaboration request was then sent to healthcare staff at both hospitals and candidates were trained in data collection for the variables of interest. Over a period of approximately three months, and subject to staff members' availability, information was recorded ([Table 3](#)) about those people admitted by the hospitals' emergency departments, and who met the previously mentioned inclusion criteria.

Table 3

Recorded Variables and Their Corresponding Values

Variable	Value
Sex	Male/Female
Age	In complete years (9-year ranges)
Method of attempt	Single or combined (several)
Date of admission	Month/Year
Time of admission	Hour/Minutes
Care following attempt	<ul style="list-style-type: none"> • Admission to ICU • Admission to hospital ward • Referral to mental health outpatient clinic • Discharge • Other (Open text)

Results

The description of the results with regard to “age”, presented in nine-year ranges, shows that 63.5% (254 people) of the total sample with recorded suicide attempts are aged between 14 and 43 years ([Figure 1](#)). If we take into account those aged 44 to 53 years, this figure rises to around 85% (341 people) of the total number of people who have attempted suicide during the research period.

Regarding the “method of suicide attempt”, the results show that single methods are more frequent than combined ones. In terms of the single methods ([Table 4](#)), the order is: medication ingestion (85.55% of total sample) and wrist-cutting (3.90%). On the other hand, the combined methods ([Table 5](#)) rank as follows: medication ingestion and alcohol (66.66% of total sample) and medication ingestion, alcohol and drugs (14.81%).

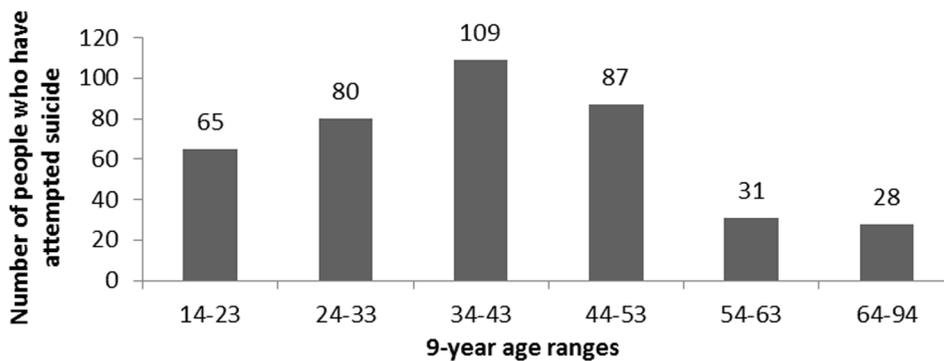


Figure 1. Number of people who have attempted suicide by age range.

Table 4

Specific Data Concerning (Single) Method of Suicide Attempt (26-Month Period)

Single method	Number of attempts	% of number of attempts
Medication ingestion (MI)	373	85.55
Wrist-cutting (WC)	17	3.90
Self-inflicted cuts to forearm	6	1.38
Hanging	5	1.15
Jumping	4	0.92
Cut using a knife	3	0.69
Cut on neck and arm	3	0.69
Head-banging	2	0.46
Insulin overdose	2	0.46
Drinking bleach	2	0.46
Puncture wound to the chest	2	0.46
Ingestion of shampoo	2	0.46
Other methods	15	3.44
Total attempts by single method	436	100.00

Table 5

Specific Data Concerning (Combined) Method of Suicide Attempt (26-Month Period)

Combined method	Number of attempts	% of number of attempts
Medication ingestion and alcohol (MI+A)	18	66.66
Medication ingestion, alcohol and drugs (MI+A+D)	4	14.81
Medication ingestion and wrist-cutting	1	3.70
Wrist-cutting and jumping	1	3.70
Jumping, medication ingestion and alcohol	1	3.70
Wrist-cutting and alcohol ingestion	1	3.70
Medication ingestion and self-inflicted cuts to forearm	1	3.70
Total attempts by combined method	27	100.00

Note. MI+A+D = Medication ingestion, alcohol and drugs.

A statistically significant relationship was also detected between “method of suicide attempt” and “sex”, $LR(3) = 14.731$; $p < .02$; consequently, ingestion of toxic substances (medicine, liquids not fit for human consumption, pesticides) has become the most frequent method of suicide among women (60.25%), with jumping and head-banging the methods of choice for a large proportion of men (75%).

In terms of “months” and “time of year” (see Figure 2), November and December (autumn) recorded 134 suicide attempts (28.94%), and August (summer) saw 51 suicide attempts (11.01% of the total sample).

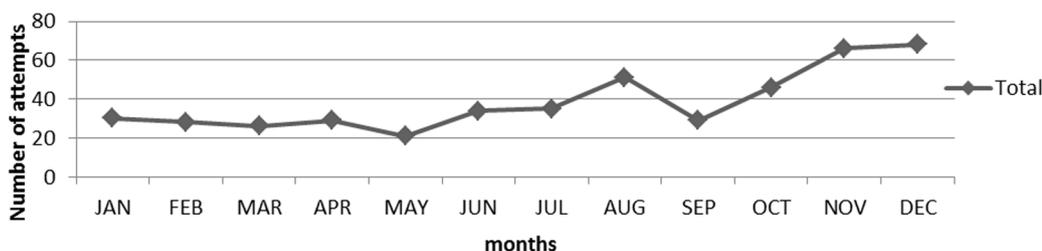


Figure 2. Total suicide attempts per month for both health districts (26-month period).

A further statistically significant relationship was observed between “time of year” and “attempt days”, $LR(6) = 13.501$; $p < .036$. The highest number of suicide attempts took place between the 1st and 10th of each month during winter (44.11%) and spring (35.52%), and between the 21st and 31st of the month during summer (43.29%) and autumn (42.76%). The analyses also detected the existence of a relationship between “time of year” and “type of care following an attempt”, $LR(12) = 69.772$; $p < .001$. In general, more discharges from hospital were made during winter (57.35%) and spring (68.42%) than in summer and autumn. In contrast, hospital admissions and referrals to health centres were higher during summer (41.23%) and autumn (24.52%) compared to winter and spring.

The results related to “days” and “time intervals of the day”, when a greater number of suicide attempts take place, show that 160 suicide attempts (34.56%) occurred between the 1st and 10th of each month, 131 attempts (28.29%) between the 11th and 20th of each month, and 172 suicide attempts (37.15%) between the 21st and 31st of each month. As for the “time intervals of the day”, 44 attempts (9.50%) were in the morning (8am to 12pm), 146 attempts (31.53%) at midday (12.01pm to 4pm), 114 attempts (24.62%) in the afternoon (4.01pm to 8pm), 78 attempts (16.85%) in the evening (8.01pm to 12am), and 81 suicide attempts (17.49%) during the early hours of the morning (12.01am to 7.59am). Consequently, the analyses identified a relationship between “time interval of the day for suicide attempt” and “sex”, $LR(4) = 9.876$; $p < .043$, with more attempts made by women at midday (73.07%) and more by men in the afternoon (39%).

In terms of the “type of care” given to the patient who carried out a suicide attempt, it was reported that of the total suicide attempts in both health districts (463 attempts), 46.44% (215) corresponded to discharges from the emergency department, 20.08% (93) were referrals to mental health services (Jaén/Úbeda hospitals) having been assessed as more serious than the norm, and 14.25% (66) were considered less serious cases, referred to a mental health specialist at a health centre or to a family physician. A further relationship was detected between the “type of care” provided following an attempt and the “method used”, $LR(12) = 20.603$; $p < .05$. More than half of all suicide attempters who resorted to the ingestion of toxic substances (medicine, liquids not fit for human

consumption, pesticides) or self-harm were discharged (57.10%). However, when the method of choice was jumping and head-banging or a combination of several methods, the patients were usually referred to the mental health unit of the hospital closest to their place of residence (41.66% jumping and head-banging, and 60% a combination of several methods).

Discussion

The findings of this study concerning gender reveal that suicide attempts, in Jaén province (Andalusia, Spain), are primarily carried out by women (65.25%). These results are similar to previous studies on attempted suicide in other emergency care districts across Spain, such as Orense in Galicia (Ávila, Fontela, & González, 2009), Oviedo in Asturias (Jiménez-Treviño et al., 2012) and Murcia (González-Navarro et al., 2012). Territorial division in Spain exemplified by the different health systems according to autonomous communities, and the inexistence of standardized and homogeneous records on non-lethal suicide, may hinder the comparison of data about gender and other epidemiological variables relating to attempted suicide among the country's different territories. The study has identified the need to implement standardized and homogeneous healthcare records for attempted suicide, as with completed suicide cases.

In this study, the "age" ranges subject to greater vulnerability for suicide attempt coincide with those reported by other authors and national and international institutions (Blazer, 2009; European Union, 2008; INE, 2009, 2010a; WHO, 2010a), where the age range particularly at risk is 15 to 44 years (for both sexes) in developed and developing countries (Baca-García et al., 2010; Patton et al., 2009).

Thus, this study shows that over half (63.5%) of all suicide attempters in both health districts are aged between 14 and 43 years. This could be explained (Consejo General de Colegios Oficiales de Psicólogos de España, 2009; Evans, Hawton, & Rodham, 2005; Pereda, 2010) by the fact that people at these stages of life are especially vulnerable to certain adverse situations (academic or work-related problems, relationship problems, lack of social support, conflicts with parents, etc.), which cause higher levels of stress compared to other important stages in a person's life. This may be a factor that modulates the appearance of emotional and psychological disorders or aggravates them. It is therefore particularly important to take into account the individual's age and any difficult situations they are likely to face in order to gauge the level of risk following a suicide attempt. This would not only help to determine a person's risk level having carried out a suicide attempt, but also reveal what age groups are especially at risk for suicide, in order to implement actions to prevent suicide attempt with greater urgency, as suggested by other authors (González-Navarro et al., 2012; Jiménez-Treviño et al., 2012).

In terms of the data obtained across the health districts in this study, it has been shown that the most frequent "method of suicide attempt" (ingestion of toxic substances) bears similarity to the method used especially in the Nordic countries and the United Kingdom (medication poisoning) (Biddle, Brock, Brookes, & Gunnell, 2008; Nordentoft, 2007; Zhang, Stewart, Phillips, Shi, & Prince, 2009). This contradicts national statistics on lethal suicide methods in Spain, where the most common method is usually hanging (INE, 2010b).

These socio-demographic differences with national data, pertaining to the health districts in Jaén province, may be due to several factors. For example, on a national level, the most frequent methods are reported for suicides that result only in death, not attempts. This suggests the need for greater prevention awareness in healthcare settings at a national and regional level, given that data relating to suicide attempts in a particular country tell us

about the efficacy of their primary mental health prevention programs. Another explanation for the discrepancy between the methods in this study and those reported nationally could be because most suicide attempts in this research are carried out by women, and we have no up-to-date information in Spain (INE, 2006) about methods of suicide according to sex when dealing with attempts.

In turn, this study's gender difference in method of suicide can be explained in various ways. For example, as suggested by other authors (Bobes-García et al., 2011; González-Navarro et al., 2012; Jiménez-Treviño et al., 2012), men probably use more lethal methods (jumping and head-banging in 75% of cases) as they are more determined when it comes to taking their own lives, whereas women may have another type of objective (attracting attention, a disguised call for help, etc.) which leads them to use less lethal methods (ingestion of toxic substances, 60.25%). Another explanation for this difference could be because men, in general, seek less help for psychological disorders due to a higher level of alexithymia (McMahon et al., 2010; Torres-Malca, 2007).

Thus, a recommendation would be to consider sex when implementing preventive measures. For example, medication and toxic substances could be restricted for women and access to lethal methods (protecting tall buildings and bridges, restricting access to firearms and pesticides) could be made more difficult for men. Early emotional education programs (Echevarría & López-Zafra, 2013), especially those designed to change the relationship between emotional expression or asking for help when faced with all types of problems and symptoms of weakness (Sánchez-Teruel, 2013), are also recommended. These could all prove to be highly effective therapy tools to prevent potential suicide attempts.

There is no scientific consensus about "seasonal patterns" or "month or day intervals" when a greater number of suicide attempts take place. However, some authors argue that there are different seasonal patterns that should be taken into account when assessing the attempt or completed suicide (López-Rodríguez, 2007). The most recent statistics (INE, 2010b) identify June (spring) as the month with the most deaths by suicide in Spain, Andalusia, and in Jaén province. In terms of attempted suicide, there is no up-to-date information (INE, 2006). In this study, which is centred on suicide attempts in Jaén, more than half (64% of the total sample) who attempted suicide did so in the autumn (39.75%) and summer (24.25%), primarily the last days of the month (from 21st to 31st) and at midday (from 12.01pm to 4pm). A possible explanation for these results may have to do with climatological factors related to these seasons (higher or lower temperatures) or other factors associated with the time of the year (more or less sunlight), but this is a hypothesis yet to be proven. These data need to be considered when implementing effective prevention measures to prevent suicide attempts in people with other additional risks or when activating follow-up procedures for individuals with prior attempts.

Furthermore, and as reported in previous studies (González-Navarro et al., 2012), a significant relationship between "time of year" and "care following a suicide attempt" has been observed in this study (higher rate of discharge in winter and spring and more hospital admissions during summer and autumn). These results are more likely to be explained by the hospital's internal organization in terms of its doctors and healthcare personnel, namely substituting permanent staff for locum doctors and healthcare workers with less experience, and not so much by other factors of a socio-demographic or clinical nature.

Scientific literature suggests that self-harming behaviours, self-inflicted injuries and suicide attempts may represent a transitory period of a cry for help, and, in some cases, are an important indicator of mental health problems and a real risk of death by suicide (Beghi & Rosenbaum, 2010; Urnes, 2009).

In fact, many people who committed suicide had visited their doctor the month previous to their death (Ubaldo & Pérez, 2010). The results of this study regarding “care following a suicide attempt” reveal that, of all recorded suicide attempts (463), 46.44% corresponded to hospital discharge, compared to 20.08% where patients were admitted to hospitals with specialized mental health services (Jaén and Úbeda). This may be because the emergency departments in question do not have specialist staff (psychologists or psychiatrists), meaning that there are no scientifically validated screening processes in place to assess the impact of clinical characteristics of people who have attempted suicide.

Moreover, it seems that the priority is to provide urgent care to treat physical injuries caused by suicide attempt according to the method used. In fact, the results of this study show that patients are discharged more frequently in the case of lower lethality methods (ingestion of toxic substances) than when the suicide method may cause a larger number of serious injuries (jumping and head-banging or a combination of several methods), the latter cases resulting in immediate hospitalization. Taking into account the method of choice according to gender, more than 65% of women who attempted suicide during the research period were discharged compared to 35% of men. In short, and in line with other studies (González-Navarro et al., 2012; Jiménez-Treviño et al., 2012), the findings reveal an urgent need to implement specific care procedures and plans of action in emergency departments in order to identify the level of severity in suicide attempts carried out by people who come to hospital following an attempt. This measure would undoubtedly reduce the number of suicide attempts that take place today in Jaén province.

One of the limitations of this research is that it has not been possible to apply quantitative analytical methods (ANOVA) when analysing the results due to the way in which the socio-demographic and epidemiological variables were measured, and there was no way of creating adequate comparison groups. Another limitation resides in the fact that data collection (DIRAYA) was carried out on only two of the four health districts in Jaén province. Therefore, the results obtained may prove not to be generalizable to suicide attempts made in other geographical contexts on a regional and national level.

What this study does do, however, is consider some future directions that could be of interest to other researchers. One would be to create comparison groups among people from different health districts, provinces, or autonomous communities in Spain. This would provide an epidemiological overview of suicide attempts for those with a stake in implementing public healthcare policies aimed at preventing this behaviour. It would also be interesting to investigate the possibility of implementing real-time, digitized medical record systems that hold specific and detailed information about suicide attempts on a provincial, regional and national level, as is the case with completed suicides. This would provide an all-encompassing and contextualized view that perhaps offers the possibility of extrapolating appropriate preventive measures and best practices to specific groups and territories.

Funding

The authors have no funding to report.

Competing Interests

The authors have declared that no competing interests exist.

Acknowledgments

The authors wish to thank the Directors of the Hospital Neurotraumatológico de Jaén and the Hospital San Agustín in Linares (Jaén, Spain) for making this research possible. Thanks also go to Dr M^a Remedios Fernández-Amela y Herrera of the Hospital Neurotraumatológico de Jaén (Spain), Manuel González Cabrera and M^a Elena Ortúñez Fernández of the Hospital San Agustín in Linares (Jaén, Spain) for supporting and taking part in this study.

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