Personalizes Social Support for non-dependent old persons decrease significantly caregivers’ burden: a longitudinal study of 876 old persons and their caregiver.

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Abstract

Background. Informal care provided by family caregivers in old persons is associated to a high risk of burden and poor health status. This study aimed to analyze the impact of a Personalized Social Support (PSS) attributed to non-dependent old persons living in the community on caregiver burden, satisfaction and frailty.

Methods. This non-interventional longitudinal study was performed in the south East area of in France: old persons asking for a PSS (>70 years old, with no disability and no severe chronic disease, living at home) and their caregiver were included with a 6-months follow up. Dyads were visited at home by social workers. Caregivers

Burden has been assessed with Mini-Zarit and frailty status with FiND (Frail Non-Disable).

Results. 876 dyads (old persons: female 77.6%, aged 82.2 ± 5.8 years old; caregivers: 64.5% female, 29% spouse, 61% children; 64% with frailty and 38% with high burden (high burden being significantly associated with frailty)) were eligible for a PSS. The follow-up was possible completed for 686 of them (78.3%). Among them, 569 PSS were financed, mainly: housekeeping and meal preparation. At follow-up, 53% of caregivers who had PSS experienced fewer difficulties in caring for their old person. Whether or not they received the PSS, 73% of the caregiver had a lower burden level, only 6% had a persistent high burden; 17% of them were less frail and 18% felt their health status was better than at the time of inclusion. 61.5% of caregivers who had PSS were totally satisfied.

Conclusions. Our study highlight that the burden occurs also in non-dependent old person’s caregivers. Social support implementation for activity of daily living had a
major impact on the burden but not on the caregiver frailty, which means that
determinants of caregiver’s frailty are more complex and further studies are
needed.

1 Background

In the coming years, the population of old persons will increase considerably. In
France, the number of people aged 75 and over will double between 2013 and 2060,
to reach nearly 13 million people (17% of the general population) (1).
In this context, promoting quality of life, well-being and dignity is a challenge,
especially for the most dependent old persons (2). Recent data have shown that
around 20% of the European population over 65 years of age is to some extent
dependent and, for the most part, assisted by a natural caregiver: mainly female
family members (3). These caregivers are essential to relay the care of the old
person and will be more and more involved in the coming years (4). The economic
value of this unpaid informal care was estimated between 6.1 and 8.3 billion euros
per year in France (5).
In France, between 8 and 11 million people aged 16 years old or over regularly help
one or more people in their entourage for health or disability reasons (i.e. nearly
one out of six people in this age group)(6). In 2015, 3 million of people aged 60 and
over and living at home received regularly assistance due to a health problem or
disability (7)
The caregiver's profile varies according the age of the person being cared for.
Indeed, with the progress in age, the massive help provided by spouses (80% when
assisted persons live in a couple) decreases in favor of the help provided by
children: 55% of old person aged 70 to 74 receive help from their spouse and 32%
from their children. From the age of 75, this situation is reversed: 32% receive help from their spouses and 52% from their children. (8)

The type of care provided by caregivers varies greatly, from treatment and care management to shopping assistance and driving out-of-town. When the help provided exceeds the physical and mental capacities of the caregiver, it becomes a chronic stressor generating what is called the caregiver's burden (3).

For health workers, it is important to correctly identify the main caregiver, assess the level of stress associated with caregiving and create a partnership with the caregiver (9). Indeed, chronic stress has a negative effect on the caregiver's mental and perceived health (depression, anxiety, psychosomatic and immunological disorders, cardiovascular problems....), increases the risk of chronic health problems (e.i., heart disease, high blood pressure) and the development of new diseases. In addition, the stress and emotional distress of the caregiver has serious consequences for the caregiver, in particular their progressive inability to fulfill their role as a caregiver, resulting in early institutionalization or unplanned hospitalization of the old person (10). Caregiver burnout can also lead to old person abuse (11–14).

Because of these consequences for caregivers and at a second level for the care recipient, it is necessary to introduce interventions and supports for the caregiver (3,15–17).

There are two main factors that contribute to reducing the burden of primary caregivers. The first is to receive specific help from another family member (18). The second is to benefit from assistance of formal systems (19).

In France, the Caisse d'Assurance Retraite et de Santé Au Travail (CARSAT: national administration for retirement and health at work) is responsible for pension
management, health and safety at work and provide assistance to vulnerable people. This national institution is represented in all French regions. As such, Southern CARSAT (For the Provence Alpes Côte d’Azur and Corsica regions) has implemented a Personalized Social Support (PSS). It is a formal service developed to provide social support to retired beneficiaries who are not yet dependent but who are at risk of becoming so (20). Support is proposed after an assessment carried out by a social worker for old person beneficiaries who request it, who are not dependent (Group Iso Resources 5 and 6 of the AGGIR grid (21)), and who do not receive other assistance for dependency. However, CARSAT does not fully cover the costs associated with the support: the level of CARSAT coverage is correlated with the income level of the beneficiary. The higher the income, the lower the share of CARSAT coverage. Thus, the financial contributions of old person vary from 10–73% of the amount of the PSS. The impact of this PSS has never been assessed, either for the beneficiary or for the caregiver.

The main objective was to analyze the impact of a PSS implemented for old persons on the burden, perceived health and frailty of their caregiver. The second objective was to describe the main characteristics of PSS.

2 Methods

2.1 Type of study

A longitudinal study was conducted in southeastern France in the PACA region (5 million inhabitants, 1 million people aged 65 years old and over) between 2016 and 2017 among 876 dyads: person aged 70 and over, CARSAT beneficiaries, and their caregivers.

2.2 Study population
All beneficiaries, non-dependent, without severe chronic disease, living at home, who requested assistance from CARSAT Southeast, who had a caregiver identified by themselves, and whose dyad (old person and designated caregiver) was voluntary to participate in the study were included consecutively between 01/04/2016 and 30/06/2017 and were followed during 6 months (T6).

If a follow-up after 6 months (refusal, unavailability) was not possible, the dyad was excluded from the study.

2.3 Ethics and funding

This study was in accordance with the bioethical laws of the time of data collection. An information letter was sending to the old person and their caregiver and consent was giving orally when the questionnaire was completed. The personal data were managed exclusively by CARSAT, which was authorized by the “Commission Nationale de l'Informatique et des Libertés” (CNIL) which deals with the protection of personal data (22).

This study was funded by CARSAT Southeast, as part of the implementation of social support for autonomous old persons.

2.4 Collection procedure

At the time of inclusion (T0), the old person was assessed at home by an independent social worker, according to the usual process, during 60 minutes. Social workers have been previously trained in the concept of frailty and the modalities of the study.

The caregiver was invited to be present at that the time of the assessment of the old person and to complete a self-assessment questionnaire with the help of the social worker if necessary.
When not present, the caregiver was assessed during a phone call by a trained Clinical Research Associate (CRA) recruited specifically for the study.

The 6-month follow-up (T6) was done by a telephone call from the CRA.

The variables collected are presented in Table 1

| Table 1 | Variables collected from the dyad at the time of inclusion and at follow-up. |
|---------|--------------------------------------------------------------------------------|
| **Variables collected from caregivers at the time of inclusion (T0)** |
| Sociodemographic data |
| Age, sex, family status (single/married) and number of children living at home |
| The relationship with the old person |
| • Spouse caregivers (spouses, partners, and ex-spouses) |
| • Child caregivers (children and stepchildren) |
| • Other caregivers (no family relationship and other family members) |
| The level of education |
| (no diploma, Youth training, BTEC First Diploma, A levels, higher education level), which has been grouped into 2 modalities: |
| • < A level (UK) |
| • ≥ A level |
| Professional activity grouped into two categories: |
| • Caregivers who are working |
| • Inactive caregivers (includes retired, unemployed and disabled) |
| Monthly income of the tax household |
| < 740 €, between 740 and 1200, between 1201 and 2200, between 2201 and 4400, > 4400 € |
| Low income: the variable was created from 3 variables: monthly income, family status and number of children living at home |
| • Low income for both among single caregivers with incomes below 1200 € and caregivers living alone or in couple with dependent children and with incomes below 2200 € (20) |
| • not low income |
| Activities performed for the old persons at the time of inclusion |
| Number of hours and days per week spent with their old person |
| Number and type of tasks performed with their old person: |
| administrative tasks, activities of daily living (transportation, household chores, pressing, meal preparation, shopping) and nursing (meal assistance, treatment assistance, getting up, going to bed, dressing, grooming) |
| The consequences of the assistance provided at the time of inclusion |
| Perceived difficulties in fulfilling their role as caregivers (5 points on the Likert scale from "not at all" to "a lot") |
| Difficulty in fulfilling their role as caregivers due to their own health status, family obligations, lack of material or financial resources, lack of specialized institutions or services, lack of dialogue with professionals or support services, lack of time, lack of expertise and lack of information about the disease |
| Feel a negative impact of the help on relationships with other family members, on the day’s outings, on leaving for a few days (5 points Likert scale from "never" to "always"). This variable has been recoded as binary "impact or not". |
| The quality of the caregiver's relationship with the old person (5-points Likert scale from "very good" to "very difficult"). This variable has been recoded as binary "good or bad relationship". |
| Caregiver Burden: Mini-Zarit Scale (ZBI) (8,21,22) |
| Caregiver’s frailty: the FiND questionnaire (23) |
| Health status and perceived health by the caregiver.(24) |
| Perceived health measured by a question: "How do you rate your health?" (5 points on the Likert scale from "excellent to "bad") |
| Variables collected from old persons at the time of inclusion |
| Sociodemographic data: age, sex, and family status |
| The level of dependence by the validated scale Autonomy Gerontology Gerontology Iso-Resource Groups (AGGIR) |
| Frailty of the old person (25) by the Frailty Group Iso-Resource Evaluation (FRAGIRE) |
| Variables collected from caregivers at follow-up |
| Number and type of tasks performed with the old person: |
| management tasks, activities of daily life (Transportation, household chores, pressing, meal preparation, shopping) and nursing (meal assistance, treatment assistance, getting up, going to bed, dressing, grooming): |
| Feel more perceived difficulties to fulfill their role as caregivers (5 points Likert scale from "not
Impact on perceived difficulties: this variable was calculated from the "perceived difficulties" variable at inclusion and follow-up. It represents the change in perceived difficulties and is divided into 5 levels (from significant improvement to significant deterioration).

Impact on burden: this variable was calculated from the "Mini-Zarit" variable at inclusion and follow-up. It represents the change in burden level and is divided into 5 levels (from significant improvement to significant deterioration).

Impact on frailty: this variable was calculated from the "FiND" variable at inclusion and follow-up. It represents the change in frailty level and is divided into 5 levels (from significant improvement to significant deterioration).

Impact on perceived health: this variable was calculated from the "perceived health" variable at inclusion and follow-up. It represents the change in perceived health and is divided into 5 levels (from significant improvement to significant deterioration).

Variables collected from caregivers and old persons at follow-up

Receiving help (yes/not)
- what help (many possible answers):
  o household chores
  o pressing
  o shopping
  o transportation
  o meal preparation
  o meal assistance
  o grooming assistance
  o dressing assistance
  o securing the house (shower, stairs...)
  o remote assistance
  o physical activities
  o satisfaction (5-points Likert scale), recoded in binary (totally satisfied or not)
  o if not satisfied, why not?
  o quality of aid (5-points Likert scale), recoded in binary (very good quality or not)
  o having experienced a problem with the performance of the service
  o which one
  o rapid resolution of the problem

If not receiving help
- the reasons for the refusal (economic, change of opinion, proposed aid different from the aid requested...)

Other professional care support (nurse, physiotherapist, ...)

2.5. Tools uses

2.5.1 Mini-Zarit Scale

7 questions on a three-point Likert scale (10,23): the items were scored: 0 (never), 0.5 (sometimes) and 1 (almost always). The total score results from the sum of the responses and ranges from 0 to 7. Four levels of burden are defined:

- \( 0 \geq No \ burden \geq 1 \)
- \( 1.5 \geq Light \ burden \leq 3 \)
- \( 3.5 \geq Moderate \ burden \leq 5 \)
- \( 5.5 \geq Severe \ burden \leq 7 \)

2.5.2 FiND questionnaire
The FiND questionnaire consists of five different questions. Two questions (A and B) were specifically aimed at identifying individuals with mobility disability: the presence of mobility disability was defined as “a lot of difficulties” or “inability” at performing at least one of these two tasks.

Three additional questions (items C-E) were aimed at assessing signs, symptoms, or conditions commonly considered as components of the frailty syndrome: weight loss (item C), exhaustion (item D), and sedentary behavior (item E) (24).

2.5.3 Autonomy Gerontology Gerontology Iso-Resource Groups (AGGIR)

This scale validated is based on the observation of the activities performed or not by the person. It measures the level of need for assistance in daily activities. There are 6 Iso Resources Groups (GIR), named from 1 to 6 per level of decreasing dependency. Group 6 corresponds to autonomous subjects (21).

2.5.4 Frailty Group Iso-Resource Evaluation (FRAGIRE)

This grid validated consists of 17 questions. The result is calculated according to an algorithm given by the authors that produces a score from 0 to 100 (25). This score allows us to identify 3 levels of fragility

- Low frailty: scores < 40
- Intermediate frailty: 40 ≥ score < 60
- High frailty: score ≥ 60

3 Results

3.1 Characteristics of the dyads included in the study

The study flowchart of is presented in Fig. 1. Of the 876 dyads interviewed at the time of inclusion, the follow-up was completed for 686 of them (78.3%). For the other 190 dyads,
for which follow-up was not possible, the most frequent reasons were accessibility, refusal or death of the old person. Characteristics of the 686 dyads are summarized in Table 2. The population at follow-up had the same characteristics than the total population at the time of inclusion.
Table 2

Characteristics of dyads with or without Personalized Social Support (PSS) at inclusion and at follow-up

| Characteristic                                                                 | Total N = 686 | PSS n = 569 | No PSS n = 117 | p      |
|--------------------------------------------------------------------------------|----------------|-------------|----------------|--------|
| **Caregiver characteristics**                                                 |                |             |                |        |
| Age, mean ± SD                                                                | 62.7 ± 13.6    | 62.9 ± 13.3 | 61.5 ± 14.7    | .310   |
| Female % (n)                                                                  | 66 (453)       | 67 (381)    | 61.5 (72)      | .259   |
| Single % (n)                                                                  | 21.9 (149)     | 20.8 (117)  | 27.4 (32)      | .118   |
| Working % (n)                                                                 | 39.8 (273)     | 40.1 (228)  | 38.05 (45)     | .746   |
| High school education % (n)                                                    | 48.4 (326)     | 49.4 (276)  | 43.9 (50)      | .283   |
| Low income % (n)                                                              | 48.2 (299)     | 49.5 (293)  | 42.2 (46)      | .166   |
| **Relationship Caregiver - Old Person**                                        |                |             |                |        |
| Spouse caregivers % (n)                                                        | 27.4 (188)     | 27.6 (157)  | 26.5 (31)      | .906   |
| Child caregivers % (n)                                                         | 61.5 (422)     | 61.2 (348)  | 63.2 (74)      |        |
| Other caregivers % (n)                                                         | 11.1 (76)      | 11.2 (64)   | 10.3 (12)      |        |
| **Caregivers limited in the assistance provided to T0 by**                    |                |             |                |        |
| His own health status % (n)                                                    | 45.1 (301)     | 45.7 (253)  | 42.5 (48)      | .535   |
| His family obligations % (n)                                                   | 30.8 (205)     | 31.6 (175)  | 26.5 (30)      | .285   |
| Lack of material/financial resources % (n)                                     | 19 (127)       | 18.1 (100)  | 23.9 (27)      | .149   |
| Lack of specialized institutions/services % (n)                               | 7.8 (52)       | 7 (39)      | 11.5 (13)      | .107   |
| Lack of dialogue with professionals % (n)                                      | 6.4 (43)       | 5.6 (31)    | 10.6 (12)      | .048   |
| Lack of time % (n)                                                             | 45 (300)       | 44.8 (248)  | 46 (52)        | .807   |
| Lack of expertise % (n)                                                        | 15.2 (101)     | 14.1 (78)   | 20.4 (23)      | .091   |
| Lack of information about the disease % (n)                                    | 4.1 (27)       | 3.6 (20)    | 6.2 (7)        | .207   |
| **Caregivers for whom the assistance provided has had an impact on**          |                |             |                |        |
| Family Life % (n)                                                             | 27.3 (186)     | 26.5 (150)  | 31 (36)        | .323   |
| The day’s outings % (n)                                                        | 47.7 (324)     | 47.4 (267)  | 49.1 (57)      | .737   |
| Leaving for a few days % (n)                                                   | 48.1 (327)     | 49 (276)    | 43.6 (51)      | .284   |
| Having a difficult relationship with the elderly person % (n)                  | 17.4 (118)     | 15.9 (90)   | 24.6 (28)      | .026   |
| At follow-up                                                                  |                |             |                |        |
| Reducing the number of hours per week % (n)                                    | 55.9 (38)      | 57.9 (33)   | 45.5 (5)       | .447   |
| Having fewer difficulties % (n)                                                | 53 (350)       | 55.7 (307)  | 39.1 (43)      | .001   |
| Burden improvement % (n)                                                       | 73.3 (439)     | 73.5 (371)  | 72.3 (68)      | .821   |
| Self-rated health improvement                                                  | 17.7 (118)     | 17.1 (95)   | 20.4 (23)      | .411   |
| Frailty improvement                                                           | 16.9 (108)     | 16.4 (88)   | 19.4 (20)      | .462   |

The average age of the old person was 82.3 years (± 5.9); 11% were over 90 years old.

The great majority were women (78%) and half lived alone (53%). The old persons were not dependent and classified in GiR 5 or 6, respectively 48% and 52%. According to the
FRAGIRE scale, 94% were fragile: 48% of them were at high risk of frailty.

In 66% of cases, caregivers were women with an average of 62.7 years (± 13.6). Most of the time, caregivers were children or stepchildren (62%), spouses represented 27%. The others (11%) were friends, neighbors, grandchildren, siblings.). Among the other caregivers, 71.7% were family members. In 3/4 of the cases, the caregivers were in a couple and had children, 35% of whom were still living with them.

Almost half (48%) of caregivers had a higher level of education and almost 40% of them were employed. For 48% of them, their incomes were low.

At the time of inclusion, the support provided by caregivers had an impact on their life, particularly on their outings and their availability to have free time for few days. In addition, 92.5% of caregivers experienced difficulties in providing support. Many reasons were reported, including poor health, lack of time and negative impact on their other family obligations (for example, the time available for children). One in five caregivers also reported a lack of material or financial resources. Finally, 17% of them indicated that they had a poor relationship with their old person.

In addition to CARSAT’s support, one in four dyad (27%) received intervention from another professional who was in most cases (88%) a health professional.

3.2 Characteristics of the personalized social support (PSS).

The vast majority (83%) of dyads received a proposal for a PSS (Table 3). The PSS was mainly a household chore (93.6%); 17.3% received shopping assistance and 16.1% received pressing assistance. Other types of support included escort during outings (6.7%), meal preparation assistance (6.2%), grooming assistance (2.3%), meal assistance (1.9%), management assistance (1.9%) and dressing assistance (0.9%).
### Table 3
Characteristics of the Personalized Social Support (PSS) and satisfaction

| Service provided                  | Percentage (n) |
|-----------------------------------|----------------|
| Household chores                  | 96.3 (545)     |
| Shopping assistance               | 17.3 (98)      |
| Pressing assistance               | 16.1 (91)      |
| Outing assistance                 | 6.7 (38)       |
| Meal preparation                  | 6.2 (35)       |
| Grooming assistance               | 2.3 (13)       |
| Meal assistance                   | 1.9 (11)       |
| Management                         | 1.9 (11)       |
| Dressing assistance               | 0.9 (5)        |
| Securing the house                | 0.9 (5)        |
| Remote assistance                 | 0.5 (3)        |
| Artistic activities               | 0.5 (3)        |
| Physical activities               | 0.2 (1)        |
| Dyads totally satisfied with the PSS % (n) | 61.5 (340)   |
| If not satisfied. Why not? % (n)  |                |
| Need more time                    | 70.5 (67)      |
| Need for other assistance         | 20 (19)        |
| too expensive                     | 2.1 (2)        |
| other reasons                     | 7.4 (7)        |
| Very good quality of PSS % (n)    | 64 (355)       |
| Having experienced a problem with the performance of the service % (n) | 8.9 (48)     |
| Changes in work hours, delays, absences, % (n) | 62.2 (28) |
| Quality of service, frequent change of service provider, % (n) | 22.2 (10)  |
| Other (delay, don't know, ...), % (n) | 15.6 (7)  |
| Rapid resolution of the problem % (n) | 47.2 (17)   |

One in five old persons received two supports, and 10% more than two. The most frequent help association was composed of household chores and pressing (29%) or shopping (27%) or meals preparation or outings assistance (5%).

### 3.3 Level of satisfaction with the PSS.

The majority of caregivers, as well as the old persons, were very satisfied with the quality of the PSS (Table 3). Almost two-thirds of old persons as well as their caregivers, felt that their needs were fully taken into account.

The main cause of dissatisfaction was the number of hours received, which was considered insufficient by two-thirds of the dyads. One in five felt they also needed other support.

Almost 9% complained about dysfunctions in the organization of the support plan as delays, absences, frequent changes of service providers. But these problems were resolved quickly in half of the cases (Table 3).

### 3.4 Refusal of the PSS.

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### 3.4 Refusal of the PSS.
For about one-fifth of dyads, the PSS was not been implemented at the time of the follow-up. This was mainly due to the old person’s refusal to receive someone at home (29.9%), the price considered too high (19.9%) and the fact that the proposed support was not adequate (8.5%) or could not be provided (6.8%). In addition, 10% preferred other support system than the PSS; and 11% of the PSS were still awaiting implementation. Finally, 16% reported having other reasons for refusing the PSS, included Institutionalization.

The demographic characteristics of the dyads who did not receive the PSS were similar to those of the dyads who received it.

However, caregivers who did not have the PPS had a poorer relationship with their old person and were less satisfied with the relationship with the health professional.

3.5 Impact of the PSS.

The vast majority of dyads received the PSS (569 with PSS versus 117 without PSS), which reduced the power of statistical comparisons and thus the ability to prove the impact of the PSS intervention.

Among the caregivers who received the PSS, a minority (n = 38) reported that they had reduced the number of hours they spent with their old person.

For more than 80% of caregivers who received PSS or did not receive, the time spent with their old person remained unchanged from the inclusion time, averaging 7.5 ± 7.0 hours and 3.8 ± 2.5 visits per week.

In addition, among caregivers who received support, obtaining support for a specific task was associated with a reduction of the time spent on that task. This was true for the household chores: 74% of caregivers who provided home help reported that they had reduced the time spent on this task by obtaining specific household help, while the decrease in time spent on household chores was only 22% of those who had not received specific help. It was also significant pressing assistance (55.6% vs 29.1%, p < 0.05),
outings assistance (31.8% vs 8.7%, \( p < 0.05 \)), shopping assistance (56.7% vs 10.1%, \( p < 0.05 \)) and meal preparation assistance (36.4% vs 8%, \( p < 0.05 \)) (Fig. 2).

Figure 3 shows the different degrees of change observed for burden, perceived difficulties, self-rated health and fragility at the 6-months follow-up.

At follow-up, 53% of caregivers experienced fewer difficulties in caring for their old person. This improvement was proportional to the support provided: it was significant for those who had a nursing assistance in addition to the PSS compared to those who had only the PSS and those who had no assistance at all (62.7% and 53.6% respectively vs 39.1%, \( p < 0.05 \)).

The burden was reduced for 73% of caregivers, whether or not they received the PSS. The analysis of the mini-Zarit items revealed that caregivers who received the PSS obtained better results for the item concerning the impact on their daily life (6.3% vs. 11.8% for those without the PSS, \( p < 0.05 \)).

At follow-up, less than one in five caregivers felt their health status was better than at the time of inclusion. In addition, according to the FiND questionnaire, 17% of them were less frail, but 12% appeared more frail. The improvement in fragility was not linked to the implementation of the PSS, even if the items constituting the FiND were analyzed separately. However, the improvement of frailty was more important for spouses than for other categories of caregivers (23% vs. 16% for child caregivers and 6% for other caregivers, \( p < 0.05 \)).

At follow-up, 15% of the old persons reported better health status, while 31% reported poorer health. These changes in health status were not related to the implementation of PSS.

4 Discussion
To our knowledge, none studies have been conducted on caregivers of a non-dependent old age population without serious chronic disease living at home. Most of studies focused on caregivers of dependent populations.

Our results show that the population of caregivers of non-dependent old persons has a similar profile to those of caregivers of dependent old persons (26,27) or with disabling illness (28–31). They have the same socio-demographic profile as caregivers of dependent persons, and also a similar level of burden following the help they provide to the old person, which also has a negative impact on their health (27,30–32). These results show that the caregiver's burden appears well in advance of the caregiver's dependence. Moreover, the number of hours and tasks carried out are as numerous as those carried out by the caregivers of dependent persons (27).

PPS had been implemented for 83% of seniors. The vast majority of the dyads were satisfied and considered that it covered their needs. To the extent that almost all subjects benefited from the PPS, the impact measurement was limited in the absence of a significant control group (569 with the PSS versus 117 without the PSS).

The results show that, at the follow-up, the burden level had improved for 73% of caregivers, whether or not they had the PSS.

According to literature review, the burden includes several component : a psychological component related to the difficulties experienced and an emotional component related to the relationship with the old person and finally a physical component related to the type and number of tasks performed (33). The fact that the burden is improving for all caregivers suggests that the consultation of social workers with the caregivers to identify the needs of the old person for the
implementation of the PPS had a positive impact on two of the three components of burden the psychological and emotional components. Indeed, the consultation could be felt for caregivers as a space to talk, a time to listen, which allowed them to express their difficulties and which broke their feeling of loneliness. This consultation probably reassured them, and they were able to project themselves towards the possibility of obtaining future support if it became necessary (34). The perceived health and frailty level of informal caregivers improved only for one in five caregivers, unrelated to obtaining the PSS (35). The fact that the burden, perceived health and frailty have improved independently of the implementation of the PSS, shows that the impact of the approach is very positive overall, as shown in the bibliography (36).

Obtaining the PSS has, as expected, reduced the amount of time the caregiver spends performing the tasks. The results show that obtaining specific help reduces not only the time spent on the targeted task but also the time spent on other tasks. This is particularly true for caregivers who were ironing or cleaning before obtaining the PSS and many (30% and 20% respectively) reported reducing the time spent on this task, even if the assistance provided by the PSS is not specific to the task. It is likely that the professionals involved do more than the targeted service and that the old person have been able to refocus on fewer tasks but more effectively, which indirectly relieve the caregiver. This could also explain the improvement in the difficulties experienced by the caregiver, which was correlated with the implementation of the PSS and affected 56% of caregivers with the PSS compared to 39% of those without it (p < 0.05).

However, the number of hours to the old person has not decreased since obtaining the PPS, excepted for 38 patients. However, the number of hours and weekly visits
to the senior has not decreased since obtaining the PPS. Several explanations are possible. First data were collected only for caregivers who did not live with the old person, this may have biased the potential positive impact of the PPS. We found that spouses were the caregivers who did the most work. This data was not collected during follow-up, it is possible that the effect of the PPS may not be highlighted. Secondly, it is possible that the needs may have increased during the 6 months or that they were not fully covered by CARSAT, and therefore that the impact on the amount of time may be moderate. Finally, maintaining the number of hours devoted to assistance may not have the same qualitative significance.

Thanks to the PPS, the caregiver spends less time performing domestic tasks but spends more time in the relationship with the old person.

The financial contribution requested from the old person could be linked to a first selection bias. Our population is precarious: the rate of caregivers close to the poverty line is much higher than that of the general population of the PACA region: 17% in PACA against 49.9% for our study (37). However, some caregivers may have underestimated their incomes because they feared that CARSAT would refuse the social support requested or that the contribution requested would be too high.

There is a second potential selection bias. We included old persons who asked for help with daily living tasks. Thus, the status of the old persons included in our study is in an intermediate level of autonomy. Our results showed that only 5% of the old persons were assessed as at low risk of frailty according to the FRAGIRE grid.

There is a third limitation regarding the measurement bias on the health status of caregivers, we did not collect objective health elements, such as walking speed. As a result, comparisons of pre- and post-PPP health status were based solely on perceived health.
The originality of this study is its target: caregivers of old persons without serious chronic diseases, autonomous and living at home. Few studies targeted theses kind of caregivers, although in terms of frequency, they are certainly the most numerous and constitute a real public health challenge, especially in future.

Moreover, while most of the studies focus on psychological or medical support activities, our study concerns the impact of exclusively social assistance. Our study is based on a large sample size and a small proportion of people lost to follow-up. In addition, the measurement tools used are all validated tools, allowing us to compare our results with those in the literature review. All these points constitute a good level of internal validity.

These results seem to underline the importance of supporting natural caregivers, and the benefit of a dedicated consultation.

There are many organizations founded and managed by informal caregivers, whose purpose is to provide information and support to peers (6). Unfortunately, they are not always easily accessible. They require that the caregiver be aware of his or her role as a caregiver, and that he or she has sufficient distance to be focused not only on the needs of the person he or she supports, but also on his or her own needs and/or difficulties. In addition, these organizations are often highly focused on a particular pathology, which may exclude caregivers of elderly people with no particular pathology.

The first action would therefore be to systematically identify during routine medical consultations whether the patient is a natural caregiver in order to advise and refer them to dedicated organizations and associations.

Action should be taken before physical and/or psychological disorders appear. We could consider setting up a specific consultation for them, as is done in the context
of dependent old persons. Most of these types of consultations are medicalized or for psychological care. We believe that these consultations could first identify the needs of caregivers and make a situational diagnosis that would make it possible to offer personalized support.

5 Conclusion

Our results show that the population of non-dependent old person’s caregivers is quite similar to that of dependent old person’s caregivers or those suffering from serious diseases in terms of socio-demographic characteristics but also in terms of burden level, perceived health status and risk of frailty. The evaluation of the implementation of a social assistance plan to improve home support for the old person shows that the intervention of a social worker in the home, whether or not the assistance plan is successful, improves the burden on caregivers, but does not quantitatively change the caregiver's investment in the old person.

The identification of the caregiver by health professionals and/or social workers is essential in order to be able to offer care adapted to his or her needs and expectations and not only through the needs of the person being cared for. The implementation of dedicated consultations could help them to discover the limits of their role as caregivers and to evaluate the difficulties they encounter in the exercise of their role so that they can be supported.

6 Abbreviations

PSS
Personalized Social Support
CARSAT
Caisse d'Assurance Retraite et de Santé Au Travail
7 Declarations

1.1 Ethics approval and consent to participate

This study was in accordance with the bioethical laws of the time of data collection. An information letter was sending to the old person and their caregiver and consent was giving orally when the questionnaire was completed. The personal data were managed exclusively by CARSAT, which was authorized by the “Commission Nationale de l'Informatique et des Libertés” (CNIL) which deals with the protection of personal data.

1.2 Consent for publication

Not applicable.

1.3 Availability of data and material

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.
1.4 Competing interests
The authors declare that they have no competing interests

1.5 Funding
This study was funded by CARSAT Southeast, as part of the implementation of social support for autonomous old persons.

1.6 Authors' contributions
Each author has made substantial contributions to the conception or design of the work or the acquisition, analysis, or interpretation of data or have drafted the work or substantively revised it.
Each author has approved the submitted version and have agreed both to be personally accountable for the author's own contributions and to ensure that questions related to the accuracy or integrity of any part of the work, even ones in which the author was not personally involved, are appropriately investigated, resolved, and the resolution documented in the literature.

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Figures
Figure 1

Flow-chart.
Figure 2

Impact of the HCP on burden, hardship, self-rated health and frailty.

* This image shows how the time spent on a task, such as the household, decreases as a result of obtaining household specific assistance (74%), but also as a result of obtaining assistance that is different from the household (22%).
Figure 3

Impact of the PSS on the time spent on tasks.
3 Results

3.1 Characteristics of the dyads included in the study

The study flowchart of is presented in Fig. 1. Of the 876 dyads interviewed at the time of inclusion, the follow-up was completed for 686 of them (78.3%). For the other 190 dyads, for which follow-up was not possible, the most frequent reasons were accessibility, refusal or death of the old person. Characteristics of the 686 dyads are summarized in Table 2. The population at follow-up had the same characteristics than the total population at the time of inclusion.
Table 2

Characteristics of dyads with or without Personalized Social Support (PSS) at inclusion and at follow-up

| Characteristics | Total N = 686 | PSS n = 569 | No PSS n = 117 | p |
|-----------------|---------------|-------------|----------------|---|
| Caregiver
| characteristics |               |             |                |   |
| Age. mean ± SD | 62.7 ± 13.6   | 62.9 ± 13.3 | 61.5 ± 14.7    | .310 |
| Female % (n)  | 66 (453)      | 67 (381)    | 61.5 (72)      | .259 |
| Single % (n)  | 21.9 (149)    | 20.8 (117)  | 27.4 (32)      | .118 |
| Working % (n) | 39.8 (273)    | 40.1 (228)  | 38.05 (45)     | .746 |
| High school education % (n) | 48.4 (326) | 49.4 (276) | 43.9 (50)      | .283 |
| Low income % (n) | 48.2 (299) | 49.5 (293) | 42.2 (46)      | .166 |
| Relationship Caregiver - Old Person |             |             |                |   |
| Spouse caregivers % (n) | 27.4 (188) | 27.6 (157) | 26.5 (31)      | .906 |
| Child caregivers % (n) | 61.5 (422) | 61.2 (348) | 63.2 (74)      |   |
| Other caregivers % (n) | 11.1 (76) | 11.2 (64) | 10.3 (12)      |   |
| Caregivers limited in the assistance provided to T0 by |             |             |                |   |
| His own health status % (n) | 45.1 (301) | 45.7 (253) | 42.5 (48)      | .535 |
| His family obligations % (n) | 30.8 (205) | 31.6 (175) | 26.5 (30)      | .285 |
| Lack of material/financial resources % (n) | 19 (127) | 18.1 (100) | 23.9 (27)      | .149 |
| Lack of specialized institutions/services % (n) | 7.8 (52) | 7 (39) | 11.5 (13)      | .107 |
| Lack of dialogue with professionals % (n) | 6.4 (43) | 5.6 (31) | 10.6 (12)      | .048 |
| Lack of time % (n) | 45 (300) | 44.8 (248) | 46 (52)        | .807 |
| Lack of expertise % (n) | 15.2 (101) | 14.1 (78) | 20.4 (23)      | .091 |
| Lack of information about the disease % (n) | 4.1 (27) | 3.6 (20) | 6.2 (7)        | .207 |
| Caregivers for whom the assistance provided has had an impact on |             |             |                |   |
| Family Life % (n) | 27.3 (186) | 26.5 (150) | 31 (36)        | .323 |
| The day's outings % (n) | 47.7 (324) | 47.4 (267) | 49.1 (57)      | .737 |
| Leaving for a few days % (n) | 48.1 (327) | 49 (276) | 43.6 (51)      | .284 |
| Having a difficult relationship with the elderly person % (n) | 17.4 (118) | 15.9 (90) | 24.6 (28)      | .026 |

At follow-up

| Reducing the number of hours per week % (n) | 55.9 (38) | 57.9 (33) | 45.5 (5) | .447 |
| Having fewer difficulties % (n) | 53 (350) | 55.7 (307) | 39.1 (43) | .001 |
| Burden improvement % (n) | 73.3 (439) | 73.5 (371) | 72.3 (68) | .821 |
| Self-rated health improvement | 17.7 (118) | 17.1 (95) | 20.4 (23) | .411 |
| Frailty improvement | 16.9 (108) | 16.4 (88) | 19.4 (20) | .462 |

The average age of the old person was 82.3 years (± 5.9); 11% were over 90 years old. The great majority were women (78%) and half lived alone (53%). The old persons were not dependent and classified in GiR 5 or 6, respectively 48% and 52%. According to the FRAGIRE
scale, 94% were fragile: 48% of them were at high risk of frailty.
In 66% of cases, caregivers were women with an average of 62.7 years (±13.6). Most of the time, caregivers were children or stepchildren (62%), spouses represented 27%. The others (11%) were friends, neighbors, grandchildren, siblings.). Among the other caregivers, 71.7% were family members. In 3/4 of the cases, the caregivers were in a couple and had children, 35% of whom were still living with them.
Almost half (48%) of caregivers had a higher level of education and almost 40% of them were employed. For 48% of them, their incomes were low.
At the time of inclusion, the support provided by caregivers had an impact on their life, particularly on their outings and their availability to have free time for few days. In addition, 92.5% of caregivers experienced difficulties in providing support. Many reasons were reported, including poor health, lack of time and negative impact on their other family obligations (for example, the time available for children). One in five caregivers also reported a lack of material or financial resources. Finally, 17% of them indicated that they had a poor relationship with their old person.
In addition to CARSAT's support, one in four dyad (27%) received intervention from another professional who was in most cases (88%) a health professional.

3.2 Characteristics of the personalized social support (PSS).
The vast majority (83%) of dyads received a proposal for a PSS (Table 3). The PSS was mainly a household chore (93.6%); 17.3% received shopping assistance and 16.1% received pressing assistance. Other types of support included escort during outings (6.7%), meal preparation assistance (6.2%), grooming assistance (2.3%), meal assistance (1.9%), management assistance (1.9%) and dressing assistance (0.9%).
### Table 3
Characteristics of the Personalized Social Support (PSS) and satisfaction

| PSS received % (n)                      |       |
|----------------------------------------|-------|
| Household chores                       | 96.3  |
| Shopping assistance                    | 17.3  |
| Pressing assistance                    | 16.1  |
| Outing assistance                      | 6.7   |
| Meal preparation                       | 6.2   |
| Grooming assistance                    | 2.3   |
| Meal assistance                        | 1.9   |
| Management                             | 1.9   |
| Dressing assistance                    | 0.9   |
| Securing the house                     | 0.9   |
| Remote assistance                      | 0.5   |
| Artistic activities                    | 0.5   |
| Physical activities                    | 0.2   |
| Dyads totally satisfied with the PSS % (n) | 61.5  |
| If not satisfied. Why not? % (n)     |       |
| Need more time                         | 70.5  |
| Need for other assistance              | 20    |
| too expensive                          | 2.1   |
| other reasons                          | 7.4   |
| Very good quality of PSS% (n)          | 64    |
| Having experienced a problem with the performance of the service % (n) | 8.9 |
| Changes in work hours, delays, absences,... % (n) | 62.2 |
| Quality of service, frequent change of service provider,... % (n) | 22.2 |
| Other (delay, don't know,...) % (n)   | 15.6  |
| Rapid resolution of the problem % (n)  | 47.2  |

Figure 1

One in five old persons received two supports, and 10% more than two. The most frequent help association was composed of household chores and pressing (29%) or shopping (27%) or meals preparation or outings assistance (5%).

### 3.3 Level of satisfaction with the PSS.

The majority of caregivers, as well as the old persons, were very satisfied with the quality of the PSS (Table 3). Almost two-thirds of old persons as well as their caregivers, felt that their needs were fully taken into account.

The main cause of dissatisfaction was the number of hours received, which was considered insufficient by two-thirds of the dyads. One in five felt they also needed other support.

Almost 9% complained about dysfunctions in the organization of the support plan as delays, absences, frequent changes of service providers. But these problems were resolved quickly in half of the cases (Table 3).

### 3.4 Refusal of the PSS.
For about one-fifth of dyads, the PSS was not been implemented at the time of the follow-up. This was mainly due to the old person’s refusal to receive someone at home (29.9%), the price considered too high (19.9%) and the fact that the proposed support was not adequate (8.5%) or could not be provided (6.8%). In addition, 10% preferred other support system than the PSS; and 11% of the PSS were still awaiting implementation. Finally, 16% reported having other reasons for refusing the PSS, included Institutionalization.

The demographic characteristics of the dyads who did not receive the PSS were similar to those of the dyads who received it.

However, caregivers who did not have the PPS had a poorer relationship with their old person and were less satisfied with the relationship with the health professional.

3.5 Impact of the PSS.

The vast majority of dyads received the PSS (569 with PSS versus 117 without PSS), which reduced the power of statistical comparisons and thus the ability to prove the impact of the PSS intervention.

Among the caregivers who received the PSS, a minority (n = 38) reported that they had reduced the number of hours they spent with their old person.

For more than 80% of caregivers who received PSS or did not receive, the time spent with their old person remained unchanged from the inclusion time, averaging 7.5 ± 7.0 hours and 3.8 ± 2.5 visits per week.

In addition, among caregivers who received support, obtaining support for a specific task was associated with a reduction of the time spent on that task. This was true for the household chores: 74% of caregivers who provided home help reported that they had reduced the time spent on this task by obtaining specific household help, while the decrease in time spent on household chores was only 22% of those who had not received specific help. It was also significant pressing assistance (55.6% vs 29.1%, p < 0.05), outings assistance (31.8% vs 8.7%,
p < 0.05), shopping assistance (56.7% vs 10.1%, p < 0.05) and meal preparation assistance (36.4% vs 8%, p < 0.05) (Fig. 2).

Figure 3 shows the different degrees of change observed for burden, perceived difficulties, self-rated health and fragility at the 6-months follow-up.

At follow-up, 53% of caregivers experienced fewer difficulties in caring for their old person. This improvement was proportional to the support provided: it was significant for those who had a nursing assistance in addition to the PSS compared to those who had only the PSS and those who had no assistance at all (62.7% and 53.6% respectively vs 39.1%, p < 0.05).

The burden was reduced for 73% of caregivers, whether or not they received the PSS. The analysis of the mini-Zarit items revealed that caregivers who received the PSS obtained better results for the item concerning the impact on their daily life (6.3% vs. 11.8% for those without the PSS, p < 0.05).

At follow-up, less than one in five caregivers felt their health status was better than at the time of inclusion. In addition, according to the FiND questionnaire, 17% of them were less frail, but 12% appeared more frail. The improvement in fragility was not linked to the implementation of the PSS, even if the items constituting the FiND were analyzed separately. However, the improvement of frailty was more important for spouses than for other categories of caregivers (23% vs. 16% for child caregivers and 6% for other caregivers, p < 0.05).

At follow-up, 15% of the old persons reported better health status, while 31% reported poorer health. These changes in health status were not related to the implementation of PSS.

4 Discussion

To our knowledge, none studies have been conducted on caregivers of a non-dependent old age population without serious chronic disease living at home. Most of studies focused on caregivers of dependent populations.
Our results show that the population of caregivers of non-dependent old persons has a similar profile to those of caregivers of dependent old persons (26,27) or with disabling illness (28-31). They have the same socio-demographic profile as caregivers of dependent persons, and also a similar level of burden following the help they provide to the old person, which also has a negative impact on their health (27,30-32). These results show that the caregiver's burden appears well in advance of the caregiver's dependence. Moreover, the number of hours and tasks carried out are as numerous as those carried out by the caregivers of dependent persons (27).

PPS had been implemented for 83% of seniors. The vast majority of the dyads were satisfied and considered that it covered their needs. To the extent that almost all subjects benefited from the PPS, the impact measurement was limited in the absence of a significant control group (569 with the PSS versus 117 without the PSS).

The results show that, at the follow-up, the burden level had improved for 73% of caregivers, whether or not they had the PSS.

According to literature review, the burden includes several component : a psychological component related to the difficulties experienced and an emotional component related to the relationship with the old person and finally a physical component related to the type and number of tasks performed (33). The fact that the burden is improving for all caregivers suggests that the consultation of social workers with the caregivers to identify the needs of the old person for the implementation of the PPS had a positive impact on two of the three components of burden the psychological and emotional components. Indeed, the consultation could be felt for caregivers as a space to talk, a time to listen, which allowed them to express their difficulties and which broke their feeling of loneliness. This consultation probably reassured them, and they were able to project themselves towards the possibility of obtaining future support if it became necessary (34).
The perceived health and frailty level of informal caregivers improved only for one in five caregivers, unrelated to obtaining the PSS (35).

The fact that the burden, perceived health and frailty have improved independently of the implementation of the PSS, shows that the impact of the approach is very positive overall, as shown in the bibliography (36).

Obtaining the PSS has, as expected, reduced the amount of time the caregiver spends performing the tasks. The results show that obtaining specific help reduces not only the time spent on the targeted task but also the time spent on other tasks. This is particularly true for caregivers who were ironing or cleaning before obtaining the PSS and many (30% and 20% respectively) reported reducing the time spent on this task, even if the assistance provided by the PSS is not specific to the task. It is likely that the professionals involved do more than the targeted service and that the old person have been able to refocus on fewer tasks but more effectively, which indirectly relieve the caregiver. This could also explain the improvement in the difficulties experienced by the caregiver, which was correlated with the implementation of the PSS and affected 56% of caregivers with the PSS compared to 39% of those without it (p < 0.05).

However, the number of hours to the old person has not decreased since obtaining the PPS, excepted for 38 patients. However, the number of hours and weekly visits to the senior has not decreased since obtaining the PPS. Several explanations are possible. First data were collected only for caregivers who did not live with the old person, this may have biased the potential positive impact of the PPS. We found that spouses were the caregivers who did the most work. This data was not collected during follow-up, it is possible that the effect of the PPS may not be highlighted. Secondly, it is possible that the needs may have increased during the 6 months or that they were not fully covered by CARSAT, and therefore that the impact on the amount of time may be moderate It. Finally, maintaining the number of hours devoted to
assistance may not have the same qualitative significance. Thanks to the PPS, the caregiver spends less time performing domestic tasks but spends more time in the relationship with the old person.

The financial contribution requested from the old person could be linked to a first selection bias. Our population is precarious: the rate of caregivers close to the poverty line is much higher than that of the general population of the PACA region: 17% in PACA against 49.9% for our study (37). However, some caregivers may have underestimated their incomes because they feared that CARSAT would refuse the social support requested or that the contribution requested would be too high. There is a second potential selection bias. We included old persons who asked for help with daily living tasks. Thus, the status of the old persons included in our study is in an intermediate level of autonomy. Our results showed that only 5% of the old persons were assessed as at low risk of frailty according to the FRAGIRE grid.

There is a third limitation regarding the measurement bias on the health status of caregivers, we did not collect objective health elements, such as walking speed. As a result, comparisons of pre- and post-PPP health status were based solely on perceived health.

The originality of this study is its target: caregivers of old persons without serious chronic diseases, autonomous and living at home. Few studies targeted these kind of caregivers, although in terms of frequency, they are certainly the most numerous and constitute a real public health challenge, especially in future.

Moreover, while most of the studies focus on psychological or medical support activities, our study concerns the impact of exclusively social assistance. Our study is based on a large sample size and a small proportion of people lost to follow-up. In addition, the measurement tools used are all validated tools, allowing us to compare our results with those in the literature review. All these points constitute a good level of internal validity.

These results seem to underline the importance of supporting natural caregivers, and the
benefit of a dedicated consultation

There are many organizations founded and managed by informal caregivers, whose purpose is to provide information and support to peers (6). Unfortunately, they are not always easily accessible. They require that the caregiver be aware of his or her role as a caregiver, and that he or she has sufficient distance to be focused not only on the needs of the person he or she supports, but also on his or her own needs and/or difficulties. In addition, these organizations are often highly focused on a particular pathology, which may exclude caregivers of elderly people with no particular pathology.

The first action would therefore be to systematically identify during routine medical consultations whether the patient is a natural caregiver in order to advise and refer them to dedicated organizations and associations.

Action should be taken before physical and/or psychological disorders appear. We could consider setting up a specific consultation for them, as is done in the context of dependent old persons. Most of these types of consultations are medicalized or for psychological care. We believe that these consultations could first identify the needs of caregivers and make a situational diagnosis that would make it possible to offer personalized support.

5 Conclusion

Our results show that the population of non-dependent old person’s caregivers is quite similar to that of dependent old person’s caregivers or those suffering from serious diseases in terms of socio-demographic characteristics but also in terms of burden level, perceived health status and risk of frailty. The evaluation of the implementation of a social assistance plan to improve home support for the old person shows that the intervention of a social worker in the home, whether or not the assistance plan is successful, improves the burden on caregivers, but does not quantitatively change the caregiver’s investment in the old person.
The identification of the caregiver by health professionals and/or social workers is essential in order to be able to offer care adapted to his or her needs and expectations and not only through the needs of the person being cared for. The implementation of dedicated consultations could help them to discover the limits of their role as caregivers and to evaluate the difficulties they encounter in the exercise of their role so that they can be supported.

6 Abbreviations

PSS
Personalized Social Support

CARSAT
Caisse d'Assurance Retraite et de Santé Au Travail

PACA
Provence Alpes Côte d'Azur

CNIL
Commission Nationale de l'Informatique et des Libertés

CRA
Clinical Research Associate

AGGIR
Autonomy Gerontology Gerontology Iso-Resource Groups

GIR
Iso Resources Groups

ANOVA
Analysis of Variance

FRAGIRE
Frailty Group Iso-Resource Evaluation

7 Declarations

1.1 Ethics approval and consent to participate

This study was in accordance with the bioethical laws of the time of data collection. An
information letter was sending to the old person and their caregiver and consent was giving orally when the questionnaire was completed. The personal data were managed exclusively by CARSAT, which was authorized by the “Commission Nationale de l'Informatique et des Libertés” (CNIL) which deals with the protection of personal data.

1.2 Consent for publication

Not applicable.

1.3 Availability of data and material

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

1.4 Competing interests

The authors declare that they have no competing interests

1.5 Funding

This study was funded by CARSAT Southeast, as part of the implementation of social support for autonomous old persons.

1.6 Authors’ contributions

Each author has made substantial contributions to the conception or design of the work or the acquisition, analysis, or interpretation of data or have drafted the work or substantively revised it.

Each author has approved the submitted version and have agreed both to be personally accountable for the author's own contributions and to ensure that questions related to the accuracy or integrity of any part of the work, even ones in which the author was not personally involved, are appropriately investigated, resolved, and the resolution documented in the literature.

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Figures
Figure 1

Flow-chart.

947 dyads eligible

53 caregivers excluded
  • 35 unreachable
  • 18 refused to participate
18 Care recipients excluded
  • 12 refused PP
  • 6 GIR < 5

876 dyads included

- 18 old persons deceased
- 66 dyads refused follow up
- 106 dyads unreachable

686 dyads analyzed
* This image shows how the time spent on a task, such as the household, decreases as a result of obtaining household specific assistance (74%), but also as a result of obtaining assistance that is different from the household (22%).

Figure 2

Impact of the HCP on burden, hardship, self-rated health and frailty.
Figure 3

Impact of the PSS on the time spent on tasks.
