

Sport, physical activity and social health in older adults. Caring with technology in the COVID-19 pandemic

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Abstract

The aim of this paper was to photograph this precise moment in history, focusing on the situation of older adults during the COVID-19 health emergency in Northern Italy. In particular, we analysed the relationship between social networks and social support, sport and recreational activity, and the use of communications technologies in December 2020. We investigated and discussed such use of technologies, wondering if and how it helped to compensate for the diminishment in social health, usually gained through social interactions and the practice of sport and physical activity. We examined how reduction of mobility, social distancing and isolation measures imposed by the government to reduce the spread of COVID-19, affected the living conditions of the older adults, in particular their social health, and the level of sport and physical activity they were engaged in. We collected data through interviews with the subjects, assessing their social networks, the perceived social support provided by their family members, friends and caregivers, and the level of sport and physical activity they were engaged in. Moreover, we analysed the impact of technological communications devices, which were employed to help older adults to maintain their relationships with the outside world and to preserve their active life. The interview questions were formulated based on the Lubben Social Network Scale-Revised (LSNS-R), the short version of the Social Support List (SSL12-I) for the elderly and the Physical Activity Scale for the Elderly (PASE). A relationship was found between the social health related to physical activity of the older adults subjects during the COVID-19 emergency and the use of communications technologies, which played a role in mitigating the impact of the crisis on their social health by helping them to keep physically and socially active.

Keywords

ageing, sport, physical activity, older adults, COVID-19, care, communications technology

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Introduction

On 30 January 2020, following China's reporting (31 December 2019) of a cluster of pneumonia cases of unknown aetiology (later identified as a new Sars-CoV-2 coronavirus) in the city of Wuhan, the World Health Organization Health Department (WHO) declared the coronavirus epidemic in China to be a public health emergency of international concern. In the following days, the Italian Government, after the first precautionary measures adopted starting from 22 January, taking into account the particularly widespread nature of the epidemic, proclaimed a state of emergency and implemented the first measures to contain the contagion throughout the country. The legislative decree of 23 February 2020, n. 6, (AC 2402) was the first of the decrees that were issued to contain and manage the COVID-19 epidemiological emergency. These decrees included measures prohibiting people from leaving or entering areas with high infection rates.

In the period of interest of this work, to further contain the contagion curve, which had risen significantly (on 3 November 2020, there were 28,244 new cases with 353 deaths), the Decree of the President of the Council of Ministers (DPCM) issued on 24 October was replaced by the 3 November 2020 DPCM, in force from 6 November. The 3 November decree called for a differentiated system of restrictions between the Regions, each of which, by order of the Ministry of Health, was assigned one of three colour-coded bands with its associated restrictions, based on the severity of the epidemiological situation according to the infection's scenarios and the 21 parameters listed in the provision: (a) yellow for areas with a moderate risk of infection; (b) orange for highly critical areas with a high risk of infection and (c) red for extremely critical areas with a very high risk level of infection. The report for the period 16–22 November 2020 showed that the transmission speed of the epidemic in Italy was slowing down and the R_t levels were close to 1 in many Regions. Moreover, for the first time in several weeks, the incidence of the COVID-19 pandemic decreased on a national level. However, the incidence was still considered too high to allow sustainable management and containment. Indeed, there was a slight increase in hospitalizations in COVID wards and intensive care units placing hospital services under constant pressure. To avoid an increase in the number of contagions, swimming pools, gyms and wellness centres remained closed.

Hence, it was important not to give in to calls for a premature loosening of the measures or for a lifting of restrictions regarding personal behaviours. This is why the Italian Government issued a new DPCM, with further restrictions aimed at avoiding a third wave of infections during the Christmas holidays. The DPCM Christmas Decree of 18 December 2020 prohibited any movement between Regions from 21 December to 6 January, although it allowed some exceptions for documented reasons. In Northern Italy, where the Regions were mainly in the orange band, the Government in the DPCM strongly recommended against all meetings between persons who did not live together in the same household except for work-related reasons or situations of absolute necessity or urgency. It was, therefore, possible to visit relatives and friends in private homes, although it was not recommended. However, such visits were only allowed within one's own municipality and these restrictions were applied to the entire country on Christmas day, the day after Christmas and New Year's day, when the ban on

moving between different municipalities was in force in all the Regions throughout Italy, regardless of their colour.

This study empirically examines social health in older adults by examining a population sample over the age of 65 in a community in Northern Italy in December 2020. Data on the subjects' social networks (SNs), social support (SS), sport and physical activity were collected during a period when social distancing measures were in place due to the spread of COVID-19. These data were correlated with data regarding the use of communications technologies, employed to keep social contacts alive and to stay connected, in order to identify the role played by such technologies. The research aims to investigate and discuss this use of technologies, and if and how it helped to compensate for the lack in subject's SS due to the government measures, and for the diminishment in SNs they could not gain through sport and physical activity.

The social health of an individual, sometimes defined as 'well-being' (Sandstrom and Dunn, 2014; Strawbridge et al., 2002), can be measured by assessing two aspects: SNs and SS (Renne, 1974; Sarason and Sarason, 1985; Tognetti, 2014; Umberson and Karas Montez, 2010). SN is a term used to describe the structural, functional and quality aspects of human relationships and interactions (Durkheim, 1897; Parsons, 1951; Putnam, 2000; Riesman et al., 1950). SS is a widely used term in scientific studies and refers to the availability of resources, such as informational, tangible and emotional support, received from others in one's SN (Bao et al., 2018; Blazer, 1982; Russell, 1973).

The theoretical basis of this study is in line with the evidence that social isolation has strong links with health behaviours (Donovan and Blazer, 2020; Dubbin et al., 2013; Durkheim, 1897; Twaddle, 1994). One possible explanation is that socially isolated individuals lack positive social influences from family and friends, so they are less likely to be exposed to (and therefore influenced by) both injunctive norms (what significant others say or want an individual to do) and descriptive norms (how much significant others actually behave), which are predictive of health behaviours (Berkman et al., 2000; Schrepft et al., 2019). Social isolation was associated with greater sedentary behaviour and lower levels of light and moderate/vigorous physical activity. These results point to the possible role of physical activity in the health risk associated with social isolation. In a large-scale study of more than 3000 older adults, social isolation was associated with an increased risk of being inactive over a 10-year period (Kobayashi and Steptoe, 2018). The differences are not large, but if small differences in physical activity persist in the daily lives of more isolated individuals, they will accumulate over time increasing the likelihood of chronic diseases and disabilities in older people.

We paid particular attention to the individual social health of older adult subjects, as measured by the SN that they each had in place, the SS they received, and sport and physical activity they were engaged in during the lockdown to contain the spread of the COVID-19 infection. The COVID-19 pandemic has imposed social isolation based on confinement and prolonged immobilization particularly on older adults because of the need to protect this age group, which is at a greater risk of serious consequences from the virus in terms of morbidity and mortality, and the impact that their infection can have on the health-care system (Nanetti et al., 2020). At the same time, the current pandemic health emergency, in which social isolation and stay-at-home orders are often

imposed to contain the spread of COVID-19, has taken a particularly heavy toll on the health of people over the age of 65, who are particularly exposed to the risks associated with physical inactivity. Mobility restrictions have impacted the ability of older people to remain physically active as walking and cycling as well as opportunities to engage in sports and exercise activities have been temporarily suspended in most countries (UN, 2020; WHO, 2020), and gyms, swimming pools and rehabilitation centres have also been closed. These measures have had a greater impact on the population over the age of 65 because members of this age group are at greater risk of social isolation and chronic diseases, and are more likely to find themselves in conditions of limited autonomy and 'vulnerability' (Armitage and Nellums, 2020; Ayalon et al., 2020; Brooke and Jackson, 2020; Heidinger and Richter, 2020; Santini et al., 2020; Xu et al., 2020).

Since physical distancing reduces everyday social interactions, the perception of social connection would be expected to decrease significantly during the COVID-19 pandemic. On the other hand, even if opportunities for social contact are reduced, the subjective perception of social connection may remain stable or even increase. Since human beings have a basic need for belonging (Baumeister and Leary, 1995; Giddens, 1991), they are accustomed to finding alternative ways to satisfy this need when deprived of their usual sources of social connection. It is possible that social interaction through alternative routes (e.g. conventional phone calls and video calls) helped to compensate for the reduction in or lack of in-person contacts. Indeed, social connection among adults has not been shown to be greatly affected during the pandemic (Folk et al., 2020). This could also be the case for older adults, as it is plausible that virtual social contacts with this age group have increased during the pandemic (possibly due to the norms of social reciprocity).

Few studies are currently available on the effects of employing digital tools, such as video calls made via the Internet using computers, tablets or smartphones, on the communication and relationships of older adults in the COVID-19 pandemic (Noone et al., 2020). We know that when a network of interpersonal relationships cannot be built or maintained, online technologies can be used to ensure SS networks and a sense of belonging (Newman and Zainal, 2020) although there are potential obstacles to the use of these technologies, such as disparities in access or lack of literacy in digital resources. Interventions to support older adults during forced isolation often simply involve more frequent telephone contact with significant others, close family and friends, volunteer organizations, community members or health professionals. However, such social interventions can now be combined with the application of technologies such as social platforms offering peer-to-peer online interactions and support groups. Social isolation in older people can create serious problems, but such problems can be mitigated by providing integrated SS through technology, such as digital applications (apps) and online SNS to improve emotional support and social interaction (Shah et al., 2019).

Methodology

The work was predominantly conceived as a descriptive work. No interpretative models, but relationships between indicators and differences between groups were identified. The small number sample, due to the difficulties in reaching respondents during the pandemic, did not allow us to approach the data with multidimensional analyses to search and/or

verify models. Indeed, the validation of multidimensional models tends to require numerous collectives. In light of the many limitations dictated by the health emergency and the fact that this was a pilot study, we limited ourselves to a sample of 117 older adult subjects, aged 65 or over, residing in a small town in Northern Italy. Some of the subjects lived at home, while others lived in a residential home for older adults. The sample of older subjects living at home consisted of older subjects randomly selected from a list provided by the municipal registry office. The sample of older subjects residing at a residential home encompassed all the subjects at the facility who were able to participate. The 'Onlus Elderly Residence' Foundation offers long-term residential living for both non-self-sufficient and self-sufficient older adults. In addition, it offers a Day Centre and accepts older adults for temporary stays.

The investigation was based on a questionnaire modelled on the Lubben Social Network Scale-Revised (LSNS-R; Lubben, 1988), the Social Support List (SSL12-I; Kempen and van Eijk, 1995) and the Physical Activity Scale for the Elderly (PASE; Washburn et al., 1993). The questionnaire also included a set of open questions on the use of technological communications devices. The required socio-demographic characteristics were sex and age, and three age groups were identified: 65–74 years, 75–84 years and 85 years and over. The questionnaire was divided into five sections and contained 36 questions.

The questions in Section one of the questionnaire measured the SN provided by the subject's 'family', while those in Section two measured the SN provided by 'friendship'. The questions were modelled on the LSNS-R. This tool was designed to measure the SNs of older people and assess social contacts received from family, friends and caregivers. The tool consists of 12 elements. The scores for each question are assigned on a scale of 0–5: with higher scores indicating greater social contacts, and thus a low risk of isolation. The total score of the LSNS-R is the sum of the scores of the 12 questions. A composite index for each subject was obtained by attributing the same importance to every single item in the questionnaire, and then adding up the single scores. Hence, values ranging from a minimum of 0 to a maximum of 60 were obtained. A score equal to or less than 20 indicated that the subject had an extremely limited SN and was thus at high risk of isolation. In order to explore the findings in greater detail, the 21–60 score range of the LSNS-R was divided into two other ranges, 21–40 and 41–60, indicating an increasing level of SN.

The questions in Section three of the questionnaire took into consideration 'all' the people in the social orbit of the subjects, that is, relatives, friends and caregivers. The questions were modelled on the Social Support List (SSL12-I) tool, and involves the construction of a scale to assess the perceived level of SS. As described by the tool itself, the responses are assigned scores from 1 to 4, with higher scores indicating greater SS. Hence, values ranging from a minimum of 12 to a maximum of 48 were obtained. According to the scale, which is based on three intervals, scores falling between 12 and 24 indicate that the subject is at risk of lacking SS or does indeed lack adequate SS, scores from 25 to 36 indicate a stable situation, and scores from 37 to 48 indicate strong SS. The composite index measure providing an overall score was obtained by attributing the same importance to each question (item) in the questionnaire, and then adding up the single scores.

The questions in Section four of the questionnaire focused on 'physical activity', which includes sport, leisure and domestic activities. The questions in this section

were taken from the PASE. This tool is designed to assess the level of habitual physical activity and has been validated with people aged 65 or over, for whom even simple daily actions or short walks must be included when calculating the amount of physical activity they engage in. The PASE consists of 12 questions, measuring the average number of hours that the subject spends per day engaging in physical recreational activities, sports and domestic and work activities in the previous week compared to the day of the interview. The 12 questions are assigned to three categories: 'Leisure time activity', 'Household activity' and 'Work-related activity'. In the survey, the first and the second categories were considered, while the 'work-related activity' category was not assessed since the interviewees in the present study were all retired. In our investigation, the evaluation did not refer only to the previous week but encompassed the entire month of December 2020 to standardize the five parts of the questionnaire. In the category 'leisure activities', the frequency and duration of participation in the following four activities were assessed: 'walking outside the home and in the garden', 'light sports and recreational activities', 'moderate sports and recreational activities' and the practice of 'specific exercises'. The frequency of the physical activity was calculated by asking the interviewees how often they engaged in these activities in the month prior to the interview (December 2020). The following four-point scale was used for the answers: 0 = never, 1 = rarely, 2 = sometimes, 3 = often, indicating an increasing amount of physical activity.

The questions in Section five considered the area of 'communications technologies'. Using a binary scale (0 = no and 1 = yes), the first question assessed whether the respondents used technological communications devices or not (a computer or tablet for e-mails, video calls and online conversations; a mobile phone for audio and video calls; video connections with television screens) in December 2020. Those who answered the first question affirmatively were then asked open questions regarding which means of communication they mainly used, the motivation or reason they used communications technologies, and if they believed that this use of communications technologies had improved their relationships with others. Those who answered 'no' to the first question were asked why they did not use technological communications devices, whether not using such devices had affected their social relationships, and what they thought of their peers who did use them. Since the answers to the open questions varied, categories were created to group the same or similar answers together.

The methodology of the investigation was partly applied directly and partly indirectly. With regard to the older subjects living at home, given the restrictions imposed by the health emergency, data could only be collected via telephone interviews. With regard to the subjects living at the residential home, the caregivers working at the facility were given the task of administering the same questionnaire to the older adults residents. Not knowing the availability of communication technologies among the subjects or their familiarity with such technologies, the collection of data through an online questionnaire was not considered feasible.

Results: Data collection and data analysis

The survey involved a total of 117 subjects. Here, we introduce tables and figures that provide a complete visual description of our findings, while the following statistical comparisons and tests provide an overview of the collected information searching for

reciprocal relationships. The small number of the sample made the analysis problematic and did not allow a fully multidimensional view of the phenomenon. All the relationships investigated are therefore deduced from bivariate analyses, under the hypothesis of 'ceteris paribus' on the other quantities involved. Given the descriptive use only and regardless of the metric characteristics of the variables, for the comparison between the distributions of the individual items, we have limited ourselves, with few exceptions, to the use of Chi-square only. Conversely, for comparisons between groups carried out on summary indicators, considering the applicability hypotheses satisfied, the *t*-test was used for single ones and ANOVA analysis for multiple ones. Finally, the study of the relationships between indicators was carried out by calculating the correlation coefficients.

The subjects, who were mainly female, were mostly between the age of 65 and 74 years (Table 1).

A total of 91 questionnaires were collected from the participants (77.8%) who were living at home. As regards the 26 older adult subjects living in the residential home (22.2%) questionnaires were completed with the help of health-care professionals working at the facility through face-to-face interviews. As regard SN, the results in Table 2, represented in Figure 1, show that most of the participants (70.1%) fell within the central range (21–40) and thus showed a situation of stability; however, subjects in this range could be susceptible to sliding into the risk range; 7.7% fell in the range 41–60 and had strong SNs. The remaining subjects, 22.2% of all participants, had an extremely limited SN and were thus at high risk of isolation. If we compare subjects living at home to those living in the residential home we find that the residents at the facility had a higher risk of social isolation (46.2% vs 15.4% in the 0–20 range; and 3.8% vs 8.8% in the 41–60 range). This is probably due to the stricter restrictions that were imposed on these facilities to contain the spread of COVID-19 pandemic.

As regard SS, the values in Table 3, represented in Figure 2, show that 26.5% of all subjects risked lacking SS or actually lacked SS, 58.1% had a situation of stability and 15.4% had good SS. It should be noted that the subjects' perceived risk of lacking SS or an actual lack of that support was lower among residents at the facility (11.5% in the 12–23 range) than it was among subjects living at home (30.8% in the 12–23 range). It was also found that 8.8% of subjects living at home had the highest level of SS (36–48), while 30.8% of those living at the residential home had the highest level of SS. The findings described show that the subjects living in the residential facility

Table 1. Population distribution by gender and age range of participants ($n = 117$).

Gender	%
Male	41.0
Female	59.0
Age	%
65–74 years	58.1
75–84 years	23.1
85 years and over	18.8

Table 2. Distribution of the composite index of the level of social contacts of the participants according to their living situation. Percentage values. ($n = 117$).

Values	Living situation		
	At home ($n = 91$)	Elderly residence ($n = 26$)	All ($n = 117$)
0–20	15.4	46.2	22.2
21–40	75.8	50.0	70.1
41–60	8.8	3.8	7.7
Total	100	100	100

had a positive perception of presence and support. It could thus be deduced that, despite the difficulties related to being considered the most ‘vulnerable’ subjects in the pandemic (and despite the critical values related to SNs showing their greater risk of social isolation), these older adult subjects were resolutely protected and looked after by the facility staff, who also provided the residents with emotional support.

We continued our study analysing the distribution of the values of SN and SS (Figures 3 and 4). By exploiting the ‘metric’ nature of the two indicators SNs and SS, the statistical study of the relative correlation with regards to the respective values between the individual units shows the presence of a substantial link between those values ($r = 0.45$, $p < 0.01$) revealing how a person’s SN determines or enriches his or her SS, preventing possible forms of loneliness and a sense of abandonment. Nevertheless, in our statistical analysis regarding the relationship between SN and SS, significant differences were found between the subjects living at home and those living in the residential home both in terms of SNs (29.1 vs 22.2; t -test, $t = 3.60$, $p < 0.01$) and SS (27.9 vs 31.5; t -test, $t = 2.34$, $p = 0.02$). We can observe that the two behaviours show opposite tendencies, since SNs are understandably weakened in the case of subjects living in the residential home, while SS benefits from such a living situation. Hence, we

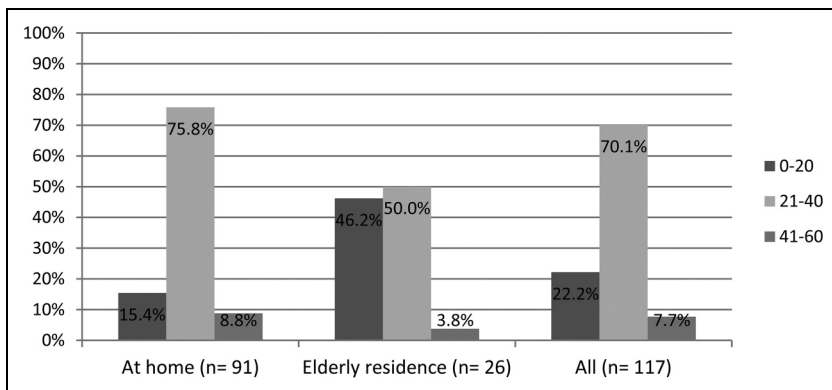


Figure 1. Distribution of the composite index of the level of social contacts of the participants according to their living situation. Percentage values. ($n = 117$).

Table 3. Distribution of the composite index of the level of social support of the participants according to their living situation. Percentage values. ($n = 117$).

Values	Living situation		
	At home ($n = 91$)	Elderly residence ($n = 26$)	All ($n = 117$)
12–24	30.8	11.5	26.5
25–36	60.4	57.7	58.1
37–48	8.8	30.8	15.4
Total	100	100	100

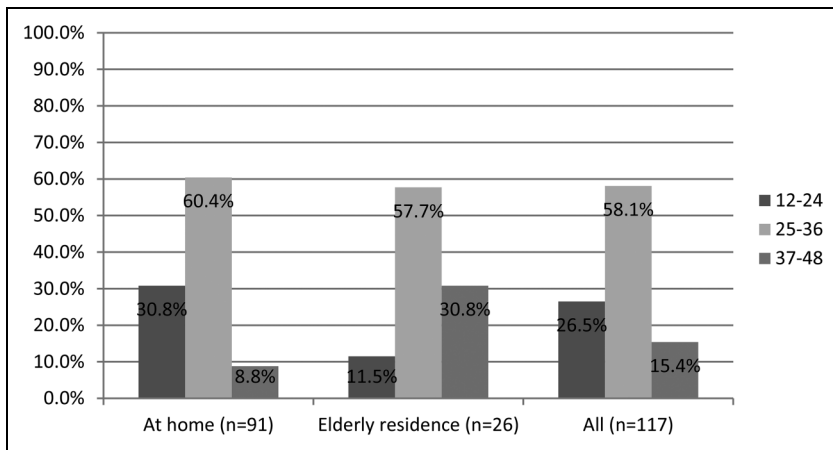


Figure 2. Distribution of the composite index of the level of social support of the participants according to their living situation. Percentage values. ($n = 117$).

have confirmation that life at the residential facility constitutes a tendential closure towards the outside world, soothed by an internal offer of support. This is not surprising if we consider that moving to the residential home entails moving away from one's previous living environment with inevitable repercussions on sociality.

Moreover, the development of SNs shows higher values among females than males (28.1 vs 26.7) although the difference is not statistically significant. The same type of differentiation (30.1 vs 26.7) is significant (t -test, $t = 2.66$, $p < 0.01$) with regard to SS. Clearly, age also plays an important role in the definition of the variables in play. Indeed, we found a progressive decrease in both the extent of SNs and SS with increasing age, which is not surprising. Also unsurprising is the fact that this decrease is more marked for SNs, which showed statistically significant differences (ANOVA, $F = 6.32$, $p < 0.01$) between the group of subjects over the age of 85 and the other two groups considered in the investigation (65–74, 75–74).

Coming to the evaluation of sport and physical activity, regarding the category 'leisure time activities', we assessed the participation in the following four activities: 'walking

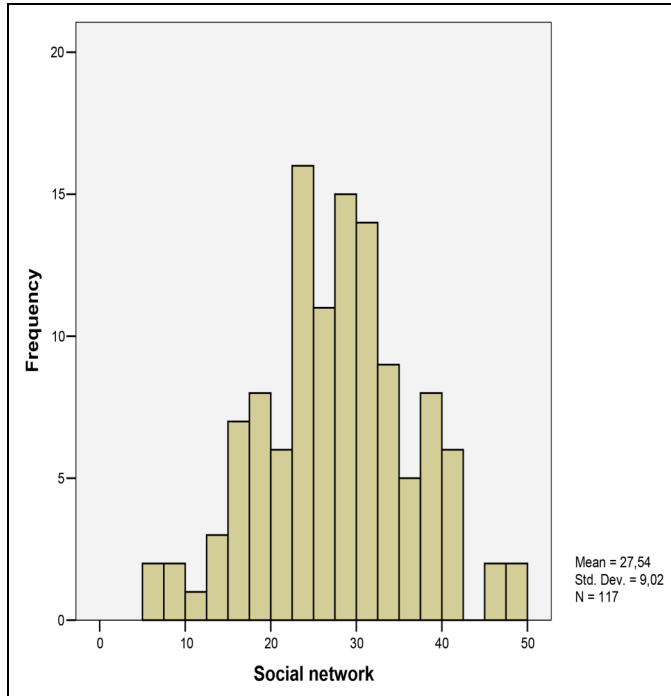


Figure 3. Distribution of social network values.

outside the home and in the garden', 'light sports and recreational activities', 'moderate sports and recreational activities' and the practice of 'specific exercises'. The results represented in Figure 5 show that most of the respondents considered 'walking' as a means of staying active, and those in Figure 6 show that most of the participants engaged in sports and recreational activities that were easier for older adults to engage in, such as playing cards and chess. The residents at the facility particularly engaged in walking and in light sports and recreational activities. The results represented in Figure 7 show that both the older adults living at home and those in the residential facility hardly engaged in moderate sport (e.g. cycling, tennis, jogging): this is probably due to the imposed restrictions in mobility. The results represented in Figure 8 show that a low percentage of all participants engaged in specific exercise activities (e.g. low-impact exercises, postural exercises, Pilates and limb strengthening exercises). For the subjects living at home, this is probably due to the closure of gyms, swimming pools and rehabilitation centres. Notably, almost all (96.2%) of the subjects living at the residential facility did not engage in these specific exercise activities. In general, we found a superiority of the values of leisure time activities for the group of subjects living at home compared to those living in the facility.

In the 'domestic physical activities' category, participation in six activities was considered: 'light housework', 'heavy housework', 'home repairs', 'outdoor gardening', 'caring for another person' and 'lawn work'. A binary scale (No = 0 and Yes = 1) was

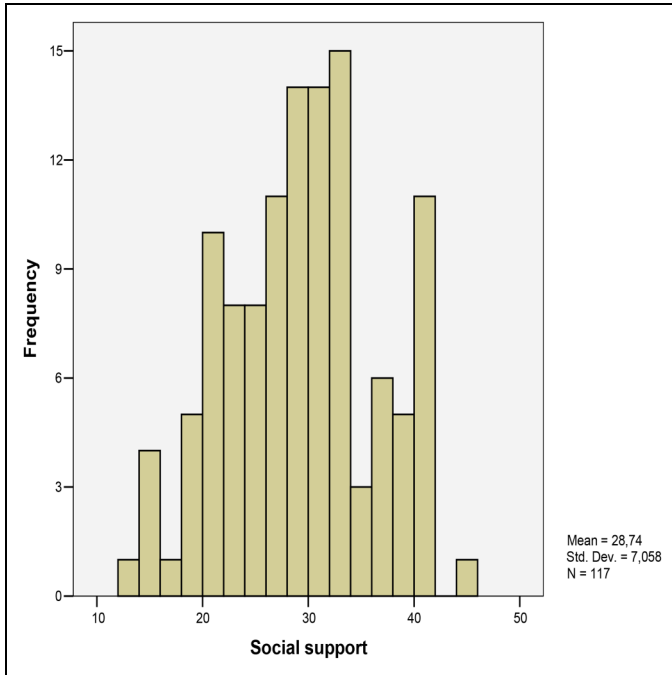


Figure 4. Distribution of social support values.

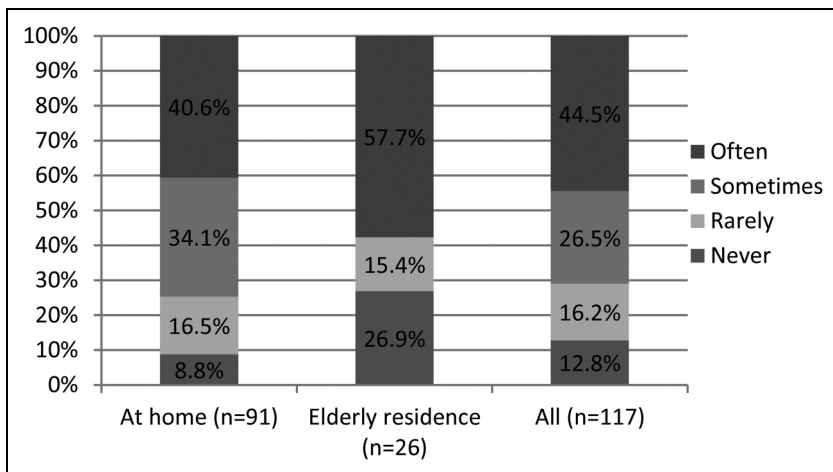


Figure 5. Leisure time activities. Walking outside the home and in the garden.

used and respondents indicated whether or not they had engaged in these activities. The respondents were not required to indicate the duration of the domestic activities in order to keep the questionnaire simple and easy to complete. It was observed that subjects living at home did housework, presumably out of necessity, but also to keep themselves

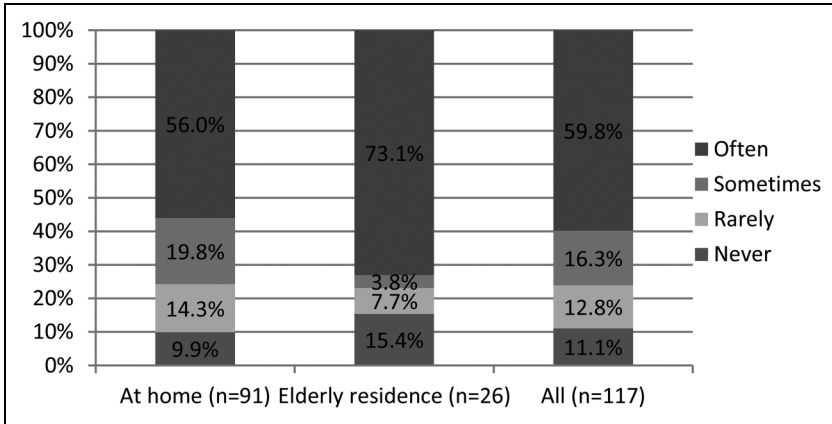


Figure 6. Leisure time activities. Light sports and recreational activities.

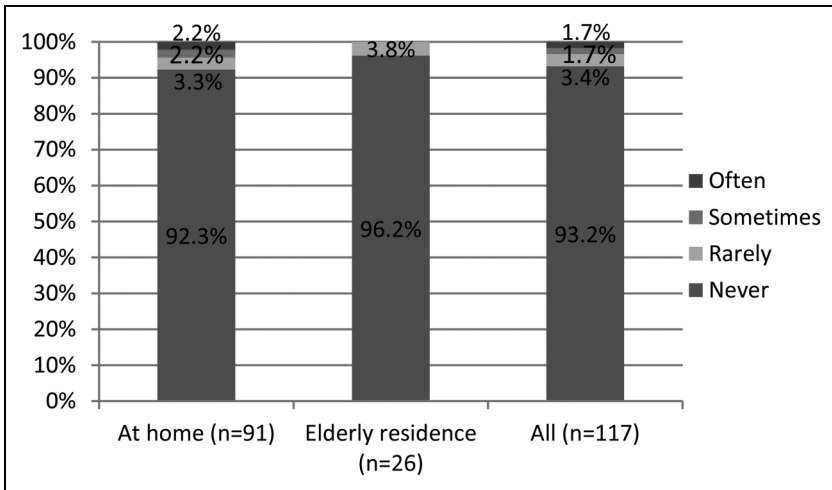


Figure 7. Leisure time activities. Moderate sports and recreational activities.

busy and active in this particular period. Clearly, with respect to these activities, older adults living at the residential home were at a disadvantage, since all of the housework at the facility is carried out by the staff for reasons related to safety, legal responsibility and hygiene. Laboratory activities supervised by educators are available to older adults living at the residential home: however, only a very small percentage of residents engage in these activities.

Here too, the two different living conditions immediately lead us to hypothesize a clear differentiation between the subjects living at home and those living at the residential home particularly with regard to domestic activities which are not an option for those residing at the facility. Indeed, when values for the two groups were compared we

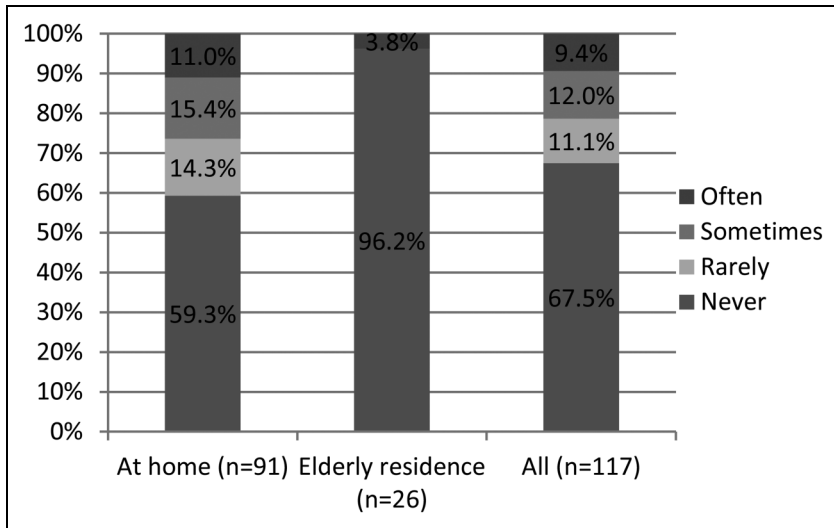


Figure 8. Leisure time activities. Specific exercises.

found a largely significant superiority of the values of the two indicators for the group of subjects living at home compared to those living in the facility. For those living at home the measure related to 'leisure time activities' was in fact almost triple (15.6 vs 5.5, $p < 0.01$) the value of those living at the residential home, and the measure related to domestic activities was practically 'zero' for those living at the residential home (3.18 vs 0.04, $p < 0.01$).

As regards gender, for leisure time activities the relative measure favoured males over females, although the difference was not statistically significant (15.9 vs 11.6, $p = 0.09$). On the other hand, it is surprising that this asymmetry was maintained, albeit to a lesser extent, for the domestic activity indicator (2.7 vs 2.3, $p = 0.27$) as well. This result can undoubtedly be accounted for by the inclusion of domestic activities, such as repairs and gardening, which certainly help to rebalance this sphere for males. Predictably, these differences held when we focus exclusively on the group of subjects living at home. We can observe that age is linked to the amount of physical activity performed. However, the comparisons, though reflecting a general decrease in physical activity with age, were found to be significant for domestic activities, with both the 65–74 age group and the 75–84 age group, proving to be much more active in this area than the over 85 year olds. It, therefore, seems that the general abandonment of activities that occurs with age affects domestic activities more selectively, affecting purely recreation activities or activities related to maintaining physical fitness to a lesser extent.

Statistical correlations concern the link between 'social' and 'physical activity' indicators. The SN is weakly and directly linked with leisure activities, ($r = 0.11$), a relationship that is not significant ($p = 0.24$); however, the relationship becomes significant when the SN is compared with domestic activities ($r = 0.37$, $p < 0.01$), that is, indexes for both increase concomitantly. On the other hand, no such links were found between SS and

leisure or domestic activities. Indeed, the relative measure practically cancel each other out ($r = 0.03$ with leisure activities and $r = -0.02$ with domestic ones); hence, domestic activities and leisure activities appear to be unrelated to SS. It, therefore, appears that there is a significant correlation between physical activity and SNs, but not SS which does not seem to be correlated with physical activity. While the leisure time activities of older adults show a weak correlation with their SN, there is a strong correlation between the domestic activities of older adults and their SN. This finding suggests that older adults living at home are thus in a better position to cope with the risks to their social health than those living in the residential facility thanks to the physical activities that they engaged in and a more extensive SN. Instead, the older adults living at the residential home are penalized because they are often more advanced in age and lack the opportunity to perform the domestic activities that show the stronger correlation with SN, during the COVID-19 pandemic.

Having ascertained the presence of the correlations between ‘social’ and ‘physical activity’ indicators, we can now examine the possible role played by the subject’s access to technologically advanced communications devices. As regard the use of communications technologies, a series of considerations can finally be made by analysing separately those subjects who used and those who did not use advanced communications devices, focusing on the characteristics of those devices, subject motivations and the advantages that were obtained through their use. The values indicated in Table 4, represented in Figure 9, show that high percentage of the subjects (79%) used technological communications devices.

Among the subjects who used technological communications devices ($n = 93$ subjects), the majority (multiple-choice options were envisaged), specifically 88.2%, used mobile phones in the audio mode, while 40.9% used mobile phones in the video call mode. This is obviously a ‘conventional’ use that adopts a new tool while not fully exploiting its possibilities. A smaller percentage, fewer than 30%, used PCs or tablets for various kinds of communications: e-mails, video calls and texting.

If we consider the subjects living at home, it is evident that they made limited use of computers or tablets: 35.2% sent and received e-mails, 15.5% made video calls and 14.1% texted; however, a high percentage of these subjects used mobile phones. Indeed, 90.1% made audio calls while 36.6% made video calls. Subjects living in the residential homemade more video calls using computers or tablets (50%) than subjects living at home (15.5%) presumably because the facility made these devices available to allow residents to maintain contact

Table 4. Share of subjects using technological communications devices in the respective living situations. Percentage values. ($n = 117$).

Values	Living situation		
	At home ($n = 91$)	Elderly residence ($n = 26$)	All ($n = 117$)
Yes	78	85	79
No	22	15	21
Total	100	100	100

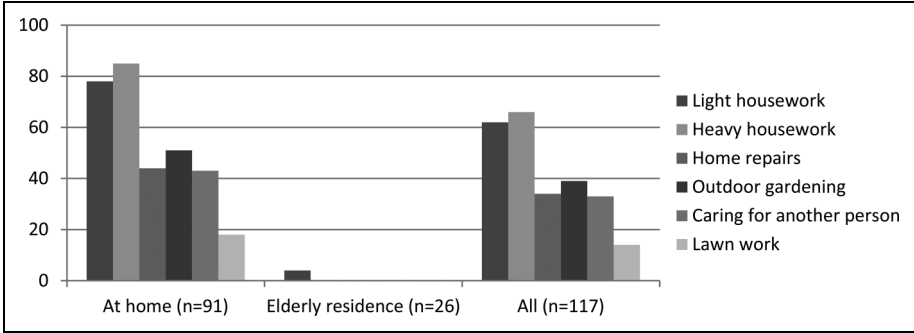


Figure 9. Household activity: light housework, heavy housework, home repairs, outdoor gardening, taking care of another person, lawn work.

with their family members. However, subjects living in the facility also used mobile phones with 81.8% making audio calls and 54.5% making video calls.

As regards motivation, a high percentage of subjects stated they used technological communications devices for the specific purpose of making up for a perceived lack of social contacts; however, a non-marginal percentage indicated ‘necessity’ as the prevailing reason. Notably, 74.2% of respondents indicated that these tools play a role in enhancing relationships. For example, just consider the fact that these tools provide interlocutors with the opportunity to establish eye contact with one another (Figure 10).

The older subjects living at home said that they used technological media to keep relationships alive (30.1%), out of necessity (20.4%), for company (7.5%), for convenience (6.5%) and to keep abreast of the news (6.5%). Other subjects, a minimal percentage, used technology out of curiosity, at the behest of others, as a pastime, to keep up with the times, for emergencies or because they received a technological device as a gift. It should be noted that, especially in the residential home, the subjects stated that they

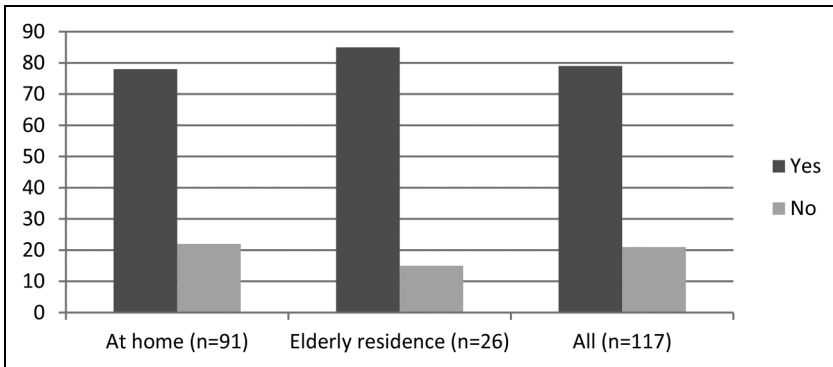


Figure 10. Share of subjects using technological communication devices in the respective living situations. Percentage values. (n = 117).

used the technological communications devices to keep relationships alive (54.5%) probably because, as shown by the data collected on SS, they had a particular need to maintain social relationships and contact with their loved ones; other subjects, much lower percentage, claimed to use communications devices at the behest of others (13.6%) and for company (9.1%).

The analysis of those who declared that they did not use technological communications devices ($n = 24$ subjects) showed overwhelmingly that these subjects, had limited ability to use these devices, suggesting that, if such limitations were removed, they too would use them. This is an important observation that should be kept in mind, especially if we consider that in the commercial sector the idea of producing devices that are more user-friendly rather than trying to provide support for users, is already taking hold. On the other hand, three quarters of the subjects who did not use technological devices reported that they were unconcerned about the possible effects of their non-use of these devices on their relationships, although, at the same time, many showed admiration for their peers who used them.

Finally, a series of statistical tests were carried out on the dependence of the areas of interest (social health related to sport and physical activity and the use of communication tools) on the context variables (gender, age and living situation).

In our statistical analysis, the average value of the measure related to SNs appears higher (28.1 vs 25.2) in the group that reported using technological communications devices ($n = 93$ subjects) than in the group that reported not using such devices ($n = 24$ subjects). This difference is not fully significant (t -test, $t = 1.43$, $p = 0.16$). In reality, this use of communications devices could also be interpreted as the subject's attempt to use networks to seek relief from his/her declared isolation, assuming that the use of technological communications devices increases contacts. The presence of a tendential statistical link shows a correlation that could be interpreted in two different ways. On the one hand, the use of communications devices could help the subject to construct or to maintain his or her SN and therefore to decrease his or her isolation. On the other hand, those who have more extensive SNs might find it helpful to use these devices. However, the fact that most of the older adults reported using the network mainly for social reasons seems to point to the former hypothesis.

The same analysis, regarding the measure of SS, again shows higher values in the group that reported using technological communications devices (29.3 vs 26.4). The difference is not fully significant (t -test, $t = 1.82$, $p = 0.07$) in this case either. Hence, it would seem that there are clear indications that communications technologies can offer advantages in terms of guaranteeing SS or in any case, in increasing the opportunities to develop such support.

There is also a significant decrease in the use of technological communications devices with increasing age (Sommers d , $d = -0.26$, $p < 0.01$). On the other hand, no gender discrepancy was found in the use of communications devices. Place of residence was found to have an effect on the use of communications devices, with residents at the facility showing a small increase in their use of such devices.

In the sample, examined leisure time activities (especially domestic activities) were shown to be linked to SNs and both seem to collapse at the residential facility. We know that having a more limited SN is associated with more sedentary and inactive

behaviours, and the latter is associated with health risks. This connection suggests that older adults living at home, who have more SN and higher levels of sport and physical activity, are in a better position to cope with age-related health risks. At the same time, walking, sport and recreational activities, the older adults at the facility engaged in, seem not to be associated with the good level of SS they enjoy. Then, we can argue that the SS they enjoy was provided by health-care professionals and was 'augmented' through the solicited use of technological communications devices. We found that, although the older adults living at the residential home were penalized because the opportunity to perform sport and physical activity in domestic activities that are associated with SN was definitely interrupted, technological communications tools played an important role in compensating for this lack.

Conclusion

The aim of this research was to photograph this precise moment in history, focusing on the situation of older adults during the COVID-19 health emergency. In particular, we analysed SNs and the risk of social isolation, sport and recreational activity, and the use of communications technologies in older adults subjects in December 2020. The COVID-19 pandemic has undoubtedly changed the habits of older adults by radically transforming their daily routines as well as their social relationships. Regarding the subjects' SNs and their risk of social isolation, most of the subjects were found to be in a stable situation, although they could be susceptible to sliding into the risk bracket. The residents at the residential home were found to have a higher risk of social isolation, possibly due to the stricter COVID-19 restrictions that were imposed on these facilities. At the same time, however, residents at the facility were found to have greater SS than their counterparts living at home. It could, therefore, be deduced that, despite the difficulties associated with being considered the most 'vulnerable' subjects (and despite the critical values related to SNs showing their greater risk of social isolation), these older adults were resolutely protected and looked after by the facility staff who also provided the residents with emotional support. Moreover, we found that there is a significant correlation between sport and physical activity and SNs but not SS, which does not seem to be correlated with sport and physical activity. While sport and the leisure time activities of older adults show a weak correlation with their SN, there is a strong correlation between the domestic activities of older adults and their SN.

We know that having a more limited SN is associated with more sedentary and inactive behaviours, and the latter is associated with health risks. This finding suggests that the older adults living at the residential home are penalized because they are often more advanced in age and lack the opportunity to perform the domestic activities that show the stronger correlation with SN, during the COVID-19 pandemic. Walking, sport and recreational activities, the older adults at the facility engaged in, seem not to be associated with the good level of SS they enjoy. Then, we can argue that the SS they enjoy was provided by health-care professionals and was 'augmented' through the solicited use of technological communications devices.

It was found that both the values related to SNs and those related to SS were higher in subjects who claimed to have made use of communications technologies than in those

who claimed not to have used them. Thus, the use of the technological communications devices can help in the construction or maintenance of SNs and therefore in decreasing the risk of isolation connected with the decrease of the possibility to engage sport in older adults. Indeed, it was found that subjects at the residential home used communications devices mainly to keep alive their relationships, which were threatened by the emergency restrictions. The greater SS enjoyed by the subjects living at the residential facility may be related to their use of communications devices - which was more common at the residential facility than among the subjects living at home. They accepted the technology and learned how to use it despite their age. Hence, such devices might be introduced into the daily lives of older adults especially those living in the residential homes to enhance the care for their social health by helping them to keep physically and socially active.


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