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The relationship between Sense of Community and perceived service quality: rethinking the role of local communities in sustaining rural health and social care

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Abstract

Background Rural areas face unique and interconnected challenges that hinder both access to and quality of health and social services. In response, local communities are increasingly called to proactively engage in identifying their own needs and developing solutions. Sense of Community (SoC) has emerged as a key element in building community capacity and resilience, as well as a crucial protective factor for individual health and well-being. However, the influence of SoC on citizens' perceived service quality remains underexplored. This investigation can provide additional evidence on how SoC reflects the social resources that can be leveraged to address common challenges. To this end, this study examines the relationship between SoC and citizens' perceived quality of health and social services in rural areas.

Methods Survey data from 405 citizens who participated in a "Population Experience Observatory" within a community-based participatory research in the rural Serchio Valley of Tuscany, Italy, were used. SoC was measured using an 8-item scale, while perceived quality was assessed through two evaluation ratings—one for health services and one for social services. Ordered logistic regressions were conducted to examine the factors influencing SoC and the relationship between SoC and service evaluations, adjusting for other individual-level and health-related factors.

Results Higher SoC was significantly associated with more positive evaluations of both health and social services (AOR: 1.49, 95% CI: 1.32–1.69, $p < 0.001$, and AOR: 1.57, 95% CI: 1.33–1.77, $p < 0.001$, respectively). Significant factors positively correlated with SoC included older age, better self-reported health, and receiving help from third-sector organizations. Also being a member of these organizations and being raised in the area were positive predictors of SoC but negatively associated with service evaluations.

Conclusions This study underscored a significant positive relationship between SoC and perceived service quality. As traditional approaches become less viable due to escalating demands and limited resources, SoC could be a valuable asset for local communities in taking more responsibility for their own health. SoC could be central in shaping a new season of rural health and social care policies aimed at ensuring the sustainable delivery of services. Such policies

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should emphasize the proactive engagement of local communities and the shift in professional roles from sole providers to advocates and enablers of these empowered communities.

Keywords Sense of Community, Rural, Remote, Service quality, Service evaluation, Citizen, Community capacity, Community building, Community-centred

Introduction

Global megatrends in recent years have imposed interconnected challenges on rural areas, forming a cycle of mutually reinforcing issues [1]. These challenges include depopulation and aging, with rural regions experiencing negative natural population balances and out-migration to urban areas—particularly among younger people—while the remaining residents continue to age [2, 3]. Depopulation contributes to further reducing population density in rural areas, with fewer residents spread over larger geographic areas, which in turn decreases the demand needed to sustain public services and infrastructure [4, 5]. This insufficient critical mass of services and infrastructure makes it harder for rural areas to support established businesses and renders them less attractive for investment and entrepreneurship, resulting in stagnant economies with low rates of new business creation [6, 7]. Fewer businesses fueling local economies lead to fewer job opportunities that further drive out-migration [8, 9], thus self-reinforcing the cycle. These dynamics also shape the context in which rural health and social care services operate. Rural areas tend to have older, more complex patient populations, who generally experience poorer health conditions and shorter life expectancy compared to their urban counterparts [10–12]. Financial and infrastructure strain is also common, as lower population density and reduced tax revenue make it difficult to maintain decentralized or specialized facilities [13, 14]. Additionally, although other sectors in rural areas face limited job opportunities, there is a persistent shortage of health and social care professionals [15]. This is driven by a combination of lower wages, restricted career advancement prospects, gaps in educational systems, professional isolation, and demanding workloads leading to burnout, which makes rural areas struggle to attract and retain professionals [16, 17]. Together, these factors create a challenging environment that undermines both access to and quality of health and social services in rural areas [13, 18].

Community-centered models that emphasize the engagement of individuals and communities—especially in health promotion and prevention—are widely advocated as potential solutions to these challenges [19–21]. In addition to addressing access and quality inequities, these models are essential for ensuring the sustainable delivery of services. Amid rising needs and constrained resources, communities capable of identifying and addressing their issues are increasingly viewed as a necessity rather than just an option [21, 22]. Consequently, local communities are crucial in shaping the future development and innovation of rural health and social services.

Sense of Community (SoC) is a crucial concept for examining local communities. SoC, originating from the field of community psychology, is defined as a feeling of belonging among community members, a belief that they matter to one another and to the group, and a shared confidence that their needs will be met through their mutual commitment to staying together [23]. This construct highlights the relational and emotional bonds within communities, rather than their structural or organizational features. These bonds are linked to the social life in the places where people live [24], developing within and being shaped by the broader social context (e.g., social relationships, networks, and norms) [25].

Numerous studies have explored the relationship between SoC and individual health, drawing on a social ecological model that emphasizes the influence of social contexts on health—an association well supported by empirical evidence [26–28]. Specifically, this research was primarily conducted in Canada, where SoC has long been included as one of the key constructs of the nationwide annual "Canadian Community Health Survey". These studies have shown that a strong SoC is associated with a reduced risk of depression [29], lower prevalence of mood and anxiety disorders [30], better self-rated general and mental health [31–34], and improved health behaviors [35], across various populations and settings. Conversely, individuals with a weaker SoC are more likely to have unmet healthcare needs due to fewer social support networks, which limit their awareness of where and how to access appropriate healthcare [36]. Additionally, as highlighted by a recent literature review [37], SoC is also positively related with the broad concept of well-being, encompassing constructs such as quality of life, life satisfaction, and happiness. At a collective level, SoC is recognized as a key resource for community capacity and resilience [38–40], potentially enhancing a community's ability to navigate and overcome problems. In this sense, SoC is closely related to the concept of social capital, with both constructs positively influencing each other [41–43]. Additionally, in rural areas, SoC may be an even more valuable resource, as higher levels of neighborliness and volunteerism —more prevalent than urban settings—positively contribute to it [44]. Figure 1 presents a simple conceptual framework that synthesizes evidence

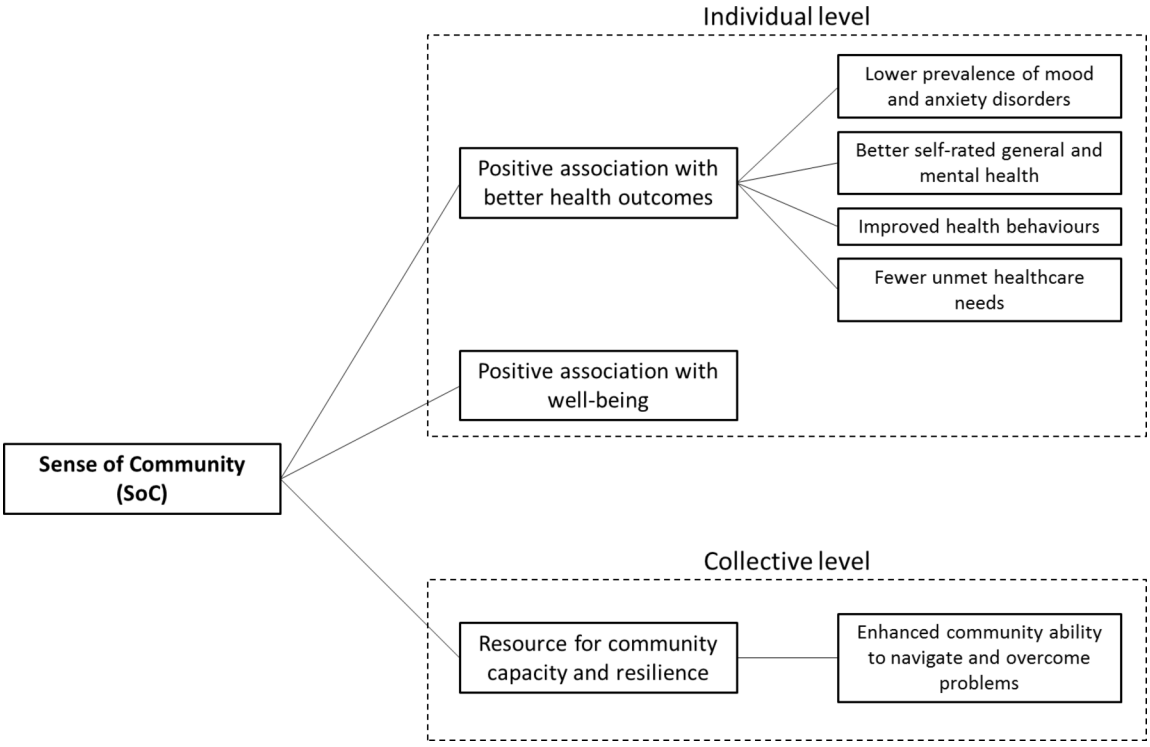

Fig. 1 Relationship between SoC and health and well-being across individual and collective levels

on the relationship between SoC and both individual and collective health and well-being.

These strong connections between SoC and health and well-being suggest that SoC may also influence individuals' expectations and experiences with local health and social services, influencing their assessment of service quality. However, to the authors' knowledge, the relationship between SoC and the perceived quality of these services has not yet been explored in existing literature. In this study, we aim to provide preliminary evidence to address this research gap. Specifically, we hypothesize that SoC plays a protective role also in this relationship. Those with stronger social support networks, a greater connection to their community, and a better understanding of its issues, along with higher levels of trust, responsibility and reciprocity (i.e. a stronger SoC), may have better perceptions of health and social services within their local areas, after adjusting for other individual-level and health-related factors. In short, we hypothesize that a stronger SoC is associated with a more positive perception of service quality.

Based on this premises, this study utilizes empirical data from a rural area in the Tuscany region of Italy to examine the relationship between SoC and the perceived quality of health and social services, as assessed by citizens' evaluations of public services.

The significance of this study is threefold. First, it introduces a new factor in understanding perceived service quality, which is essential for assessing service outcomes (not just outputs), identifying areas for improvement, informing policy development, and promoting accountability [45]. Second, it can provide additional evidence on how SoC reflects the social resources that can be leveraged to address common challenges at both individual and collective levels. Ultimately, this research can shed light on the potential of local communities to shape the future development of rural health and social services, ensuring their sustainable delivery amid growing demands. In essence, this research can underscore the relevance of SoC for health and social care in rural areas.

Methods

Setting

This study took place in the Serchio Valley ("Valle del Serchio", in Italian), a rural area in northern Tuscany, in the province of Lucca. The Serchio Valley, home to about 60,000 residents across 21 municipalities, covers roughly 925 square kilometers of high elevations and extensive forested land. According to the classification of the Italian Strategy for Inner Areas ("Strategia per le Aree Interne," SNAI) [46], all the municipalities in the Serchio Valley are categorized as peripheral (some even ultra-peripheral), with roundtrip travel times to essential services offered in urban centers exceeding 1 h and 20 min. The valley has two small hospitals located in the main towns (Castelnuovo di Garfagnana and Barga); however, they

are unable to provide high-intensity or highly specialized care, requiring residents to travel to larger urban hospitals (mainly in Lucca) for such services. Additionally, like other rural areas, the valley suffers from a shortage of health and social care personnel. The Serchio Valley has one of the highest concentrations of third-sector organizations in Tuscany [47], many providing basic health and social services, including patient transportation, alongside the national health service. In terms of population and health outcomes, the Serchio Valley has the lowest birth rate in Tuscany (with a negative trend), one of the highest aging indices and percentages of residents over 75 (with a positive aging and depopulation trend), the highest mortality rate, and one of the highest prevalence rates of chronic diseases in the region [47].

This study is part of a broader community-based participatory research (CBPR) initiative —the Proximity Care project— aimed at developing and testing innovative solutions to address the health and social challenges of the Serchio Valley. The overarching goal of Proximity Care is encapsulated in its motto "Stare bene qui" (which can be translated as "Living well here"), reflecting the collective commitment to supporting the local population in thriving in the Serchio Valley. On a more practical level, the project seeks to integrate local knowledge, resources, and expertise with those of the research team, fostering co-learning and the co-development of tailored solutions. It also aims to challenge the conventional process of innovation diffusion—where new solutions typically emerge in centralized urban areas before reaching rural and peripheral regions—by designing and piloting interventions in the Serchio Valley that could later be adapted to other settings. Promoted by a nonprofit foundation, the project aims to actively engage a broad network of stakeholders, including municipal governments, local health authorities, third-sector organizations, and, more broadly, the citizens of the Serchio Valley. A steering committee, composed of representatives from local stakeholders and research staff, guides the project's strategic decision-making. The project spans five years (from late 2021 to late 2026), with a long-term commitment to ensuring sufficient time for effectively carrying out its three main phases: identifying local needs, co-developing and testing solutions through an iterative learning process, and evaluating project outcomes. The ultimate and desired goal is to pave the way for sustainable solutions and long-term improvements in the Serchio Valley. Through this process, ten subprojects have been developed, addressing a variety of needs, including promoting healthy lifestyles among adolescents, deploying a mobile unit for oncological screening, implementing peer education programs for individuals with diabetes, developing telemedicine solutions for chronic patients, introducing tele-emergency systems, providing simulation-based training for local health professionals, testing exoskeletons to support family caregivers, mapping services for individuals with disabilities, offering tailored training for municipal administrators, and establishing a "Population Experience Observatory". This study specifically focuses on the latter initiative, detailed in the "Tools" section below.

Tools

The Population Experience Observatory was developed to gather citizens' perspectives on various aspects of daily life in the Serchio Valley, aiming to identify their priorities and assess informal community resources. The primary tool of the Observatory is a survey developed through a collaborative, community-driven process. The main participants in this process were the mayors of the involved municipalities, given their central role and perspective on local citizenship. Seventeen semi-structured interviews were conducted with them to define the Observatory's topics, exploring residents' needs and the present and future role of public services and other local actors in addressing them. Additional input came from other key stakeholders, though these consultations did not exclusively focus on the Observatory but were part of the broader needs assessment for the Proximity Care project. These included local health and social care managers and professionals (five interviews and two focus groups, respectively), as well as representatives of the third sector (five interviews and three focus groups). Key topics of the Observatory include citizen's experiences with public services (like health and social care), mobility, internet connectivity, volunteer participation and third-sector activities, quality of life, and the shared SoC. Researchers designed the survey content based on stakeholder input and relevant literature. An initial draft of the survey was discussed in a dedicated meeting involving representatives of the foundation that promoted the Proximity Care project and mayors. The final version of the questionnaire was validated by mayors through an online preview, where they could provide comments on each survey question regarding both content and wording. Mayors were also encouraged to share the survey link with their collaborators to gather additional feedback; in total, 23 responses were collected. Additionally, three researchers not involved in the project reviewed the questionnaire to ensure item clarity and understandability providing further validation from an external perspective. Following the initial pilot phase (April 2023 - July 2023), the survey was further refined to improve its structure and flow, aiming to enhance respondent engagement.

The survey is open to all adult residents in the project areas and is administered online via a self-enrollment mechanism, where individuals voluntarily choose to

participate. At the end of the questionnaire, participants can also choose to join a panel of local residents by providing their contact information. By joining the Observatory's panel, citizens can receive dedicated invitations for future research and updates on the Observatory's and the broader project's activities. Promotion is conducted through various materials and channels inviting Serchio Valley citizens to take part in the survey. Postcards, posters, and flyers with a QR code linking to the survey have been distributed in municipal offices, third-sector organizations, health facilities, and at events associated with the Proximity Care project across the Serchio Valley. Additional outreach occurs sharing the survey link through the communication channels of participating institutions and municipalities, including websites and social media, as well as informal community networks such as WhatsApp groups.

Since the questionnaire is open to all citizens, there are no exclusion criteria apart from being 18 years or older and residing in the project area. These requirements are clearly stated in promotional materials and on the survey's first page. Additionally, respondents must confirm their age and residency through dedicated survey questions, and any responses that do not meet these criteria are discarded. The first page of the survey includes an information document, developed in collaboration with the university's data protection office, outlining the study's purpose, data management practices, and contact details. Participants provide informed consent by opting into the survey after reviewing this information. The survey is anonymous and data are managed in accordance with the European Union's General Data Protection Regulation (GDPR).

Data collection will continue throughout the duration of the Proximity Care project (end of 2026), allowing for longitudinal analysis. The Observatory's findings are periodically discussed in dedicated meetings with mayors, and larger dissemination events—open to all stakeholders—are also organized. Additionally, publicly available report featuring regularly updated descriptive statistics from the Observatory's data can be accessed on the project website. Finally, the panel of local residents will be engaged in dedicated meetings to review findings and discuss new initiatives.

Measures

The measures used in this study (Supplementary File 1) are part of the Population Experience Observatory survey and were developed following the process outlined in the "Tool" paragraph above. During the needs identification phase and consultations with local stakeholders, feelings of belonging and communal ties, along with the quality of local public services, emerged as significant aspects shaping residents' lives in the Serchio Valley. In response to these insights, researchers incorporated measures of SoC and public service evaluation into the survey, which were later validated as described in the "Tool" paragraph.

SoC is measured using an 8-item scale reflecting the widely adopted framework proposed by McMillan and Chavis [23], encompassing the core tenets of SoC (membership, needs fulfillment, influence, and shared emotional connection), as well as the additional dimension of responsibility towards the community proposed by Nowell and Boyd [48]. Specifically, the items were selected and adapted from existing scales, such as the Sense of Community Index [49], the Brief Sense of Community Scale [50], and the Sense of Community Responsibility Scale [51]. Each item presents a statement about the Serchio Valley area, and respondents indicate their level of agreement on a 10-point Likert scale ranging from 1 (completely disagree) to 10 (completely agree). The items are: "I feel that I belong to this area", "I think this area is a good place to live", "I plan to continue living in this area in the future", "I am ready to play my part in building the future of this area", "I believe that the future of this area lies in the hands of the people who live here", "I feel connected to this area", "One of the best things I can do to improve this area is to be of help to others", "I think it is my duty to give to this area without expecting anything in return".

Evaluation of health and social services in the Serchio Valley area is measured with two items investigating citizens' general satisfaction, which serves as an indicator of perceived service quality [52, 53]. The items are: "On a scale from 1 to 10, where 1 indicates not at all satisfied and 10 indicates fully satisfied, how do you rate the health services/social services in your area?".

Survey respondents report several individual-level and health-related factors. These included demographic characteristics: gender, age, level of education, and employment status. They also provide dichotomous (yes or no) answers to the following questions: whether they were raised in the Serchio area, if they live alone, if they receive regular assistance from someone (have a caregiver), if they provide regular assistance to a family member (are a caregiver), if they are a member of a third-sector organization, if they have received any health and/or social care assistance from a third-sector organizations in the last twelve months, and if they have used any health services in the last twelve months. Finally, they describe their general health status on a 10-point Likert scale, ranging from 1 (worst possible health) to 10 (best possible health).

Data analysis

Data analysis included descriptive statistics of the citizens who completed the survey from July 2023 (when the final version of the survey was released) to July 2024 (the time of writing this article). Frequency distributions

and mean values were calculated for SoC (averaging its eight items) and for the evaluation of health and social services.

Three ordered logistic regressions were performed. The first regression explored factors influencing SoC (dependent variable) using the collected individual-level and health-related factors as predictors. The second and third regressions examined the relationship between SoC and the evaluation of health services (dependent variable in the second regression) and social services (dependent variable in the third regression), adjusting for the potential confounding of the collected individual-level and health-related factors. The significance level was set at $p < 0.05$. Data analysis was performed using Stata 17.0.

Table 1 Participants' characteristics

	n	%
Sex		
Female	310	76.5%
Male	95	23.5%
Age		
18–29	51	13%
30–44	72	18%
45–64	220	54%
65+	62	15%
Education		
Elementary school or none	11	3%
Middle school	89	22%
High school	202	50%
University	103	25%
Employment		
Employed	276	68%
Retired	60	15%
Unemployed	69	17%
Raised in the Serchio Valley		
Yes	310	76.5%
No	95	23.5%
Lives alone		
Yes	51	13%
No	354	87%
Has a caregiver		
Yes	75	18.5%
No	330	81.5%
Is a caregiver		
Yes	144	36%
No	261	64%
Third-sector organization member		
Yes	120	30%
No	285	70%
Helped by a third-sector organization		
Yes	78	19%
No	327	81%
Used health services in the last year		
Yes	341	84%
No	64	16%
Self-reported general health Mean (SD) = 7.63 (1.42)		

Results

Participants

The study included a total of 405 citizens (Table 1), 76.5% of them were women. Age distribution was: 13% aged 18–29, 18% aged 30–44, 54% aged 45–64, and 15% aged 65 or older. Regarding education, 3% had an elementary school education or none, 22% had a middle school education, 50% had a high school education, and 25% had a university degree. In terms of employment, 68% were employed, 15% were retired, and 17% were unemployed. Additionally, 76.5% of the respondents were raised in the Serchio Valley, and 13% lived alone. About 18.5% had a caregiver, and 36% were caregivers themselves. Membership in a third-sector organization was reported by 30%, while 19% received help from such organizations. Furthermore, 84% had used health services in the last year. The mean self-reported general health status was 7.63 (SD = 1.42).

According to the latest available census data [54], the overall population of the Serchio Valley consists of 51% women and age distribution is as follows: 11% aged 18–29, 17% aged 30–44, 38% aged 45–64, and 34% aged 65 or older. While specific data on education and employment for the Serchio Valley are unavailable, figures from the broader province of Lucca provide some context. However, it is important to note that this province includes diverse areas, such as the city of Lucca and the coastal region of Versilia. In Lucca province, 19% of the population has an elementary school education or none, 31% have a middle school education, 36% have a high school education, and 14% have a university degree [55]. Regarding employment, no detailed breakdown is available; the overall employment rate in the province is 46.5%, with an unemployment rate of 9% across all age groups [55]. Compared to the general Serchio Valley population, the study sample has a notably higher proportion of women, with middle-aged individuals overrepresented while older age groups are underrepresented. Additionally, in comparison to the broader province of Lucca, the sample reflects a higher overall educational level, with fewer respondents having only an elementary school education or less and a greater number of participants with higher educational attainment.

Descriptive analysis

The mean SoC was 7.77 (SD = 1.60). The mean evaluation of health services was 6.29 (SD = 1.90), while the mean evaluation of social services was 5.69 (SD = 2.30). Figure 2 shows the frequency distributions of these three variables.

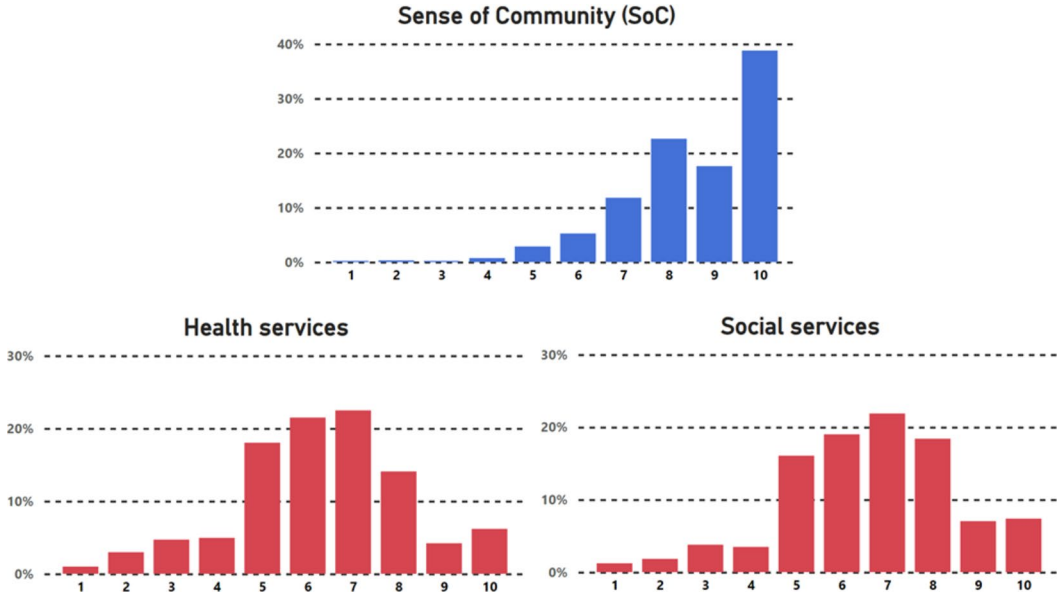

Fig. 2 Frequency distributions for SoC and evaluation of health and social services ($N = 405$)

Table 2 Ordered logistic regression analyses

Dependent variable	SoC	Health services evaluation	Social services evaluation
	AOR (95% CI)	AOR (95% CI)	AOR (95% CI)
Independent variables			
SoC	/	1.49***(1.32–1.69)	1.57***(1.33–1.77)
Sex (female)	0.86 (0.56–1.33)	1.25 (1.17–2.92)	1.06 (0.69–1.63)
Age (reference: 18–29)			
30–44	2.19* (1.16–4.15)	0.49 (0.26–0.95)	1.06 (0.55–2.05)
45–64	2.35** (1.35–4.08)	0.95 (0.55–1.65)	1.68 (0.96–2.94)
65+	3.72** (1.56–8.85)	1.23 (0.49–3.07)	1.80 (0.73–4.45)
Education (reference: Elementary school or none)			
Middle school	1.00 (0.30–3.30)	0.31 (0.09–1.09)	0.65 (0.17–2.42)
High school	0.64 (0.20–2.03)	0.23* (0.07–0.80)	0.52 (0.14–1.92)
University	0.73 (0.22–2.39)	0.20* (0.06–0.71)	0.48 (0.13–1.81)
Employment (reference: Employed)			
Retired	1.35 (0.68–2.68)	0.88 (0.42–1.84)	0.99 (0.49–2.02)
Unemployed	1.26 (1.09–3.16)	1.13 (0.66–1.92)	1.36 (0.80–2.32)
Raised in the Serchio Valley	1.55* (1.01–2.40)	0.38***(0.25–0.59)	0.79 (0.51–1.20)
Lives alone	0.88 (0.52–1.48)	1.03 (0.60–1.79)	0.68 (0.39–1.20)
Has a caregiver	1.20 (0.77–1.86)	1.26 (0.80–1.99)	1.35 (0.84–2.14)
Is a caregiver	1.15 (0.79–1.67)	1.14 (0.78–1.66)	0.96 (0.66–1.41)
Third-sector organization member	1.87** (1.27–2.77)	0.33***(0.22–0.50)	0.55** (0.37–0.82)
Helped by a third-sector organization	1.85** (1.18–2.92)	1.14 (0.71–1.84)	1.20 (0.73–1.95)
Used health services in the last year	0.89 (0.55–1.45)	1.06 (0.63–1.78)	0.90 (0.55–1.48)
Self-reported general health	1.30***(1.14–1.49)	1.25** (1.09–1.44)	1.17* (1.02–1.34)

AOR means Adjusted Odds Ratio, *95% CI* means 95% Confidence Interval

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Regression analyses

Table 2 presents the results of the three ordered logistic regression analyses with adjusted odds ratios (AOR), 95% confidence intervals (CI), and p-values (p) reported. For SoC: age was a significant influencing variable, with older age groups exhibiting higher odds of a stronger SoC compared to the reference group of individuals aged 18–29. Additionally, being raised in the Serchio Valley (AOR: 1.55, 95% CI: 1.01–2.40, $p < 0.05$), being a member of a third-sector organization (AOR: 1.87, 95% CI: 1.27–2.77, $p < 0.01$), and receiving assistance from these associations (AOR: 1.85, 95% CI: 1.18–2.92, $p < 0.01$) were

associated with higher SoC. Self-reported general health also positively correlated with SoC (AOR: 1.30, 95% CI: 1.14–1.49, $p < 0.001$).

For the evaluation of health and social services, higher SoC significantly predicted better evaluations of both (AOR: 1.49, 95% CI: 1.32–1.69, $p < 0.001$, and AOR: 1.57, 95% CI: 1.33–1.77, $p < 0.001$, respectively). Individuals with higher education levels showed significantly lower evaluations of health services compared to the reference group of individuals with an elementary school degree or no degree. Additionally, individuals raised in the Serchio Valley showed significantly lower evaluations of health services (AOR: 0.38, 95% CI: 0.25–0.59, $p < 0.001$). Membership in a third-sector organization was linked to lower evaluations of both health (AOR: 0.33, 95% CI: 0.22–0.50, $p < 0.001$) and social services (AOR: 0.55, 95% CI: 0.37–0.82, $p < 0.01$), while self-reported general health was positively associated with evaluations of both (AOR: 1.25, 95% CI: 1.09–1.44, $p < 0.01$, and AOR: 1.17, 95% CI: 1.02–1.34, $p < 0.05$, respectively).

Discussion

In this study, we explored the relationship between SoC and the perception of rural health and social services quality. SoC has been identified as a crucial protective factor for health and well-being across both individual and collective levels. Our objective was to investigate whether this protective effect also influences views on service quality, after adjusting for other individual and health-related variables. To this end, we analyzed SoC and citizens' evaluations of health and social services in the Serchio Valley, a rural area in Tuscany, Italy. Specifically, we used data from 405 individuals who participated in a "Population Experience Observatory" survey within a community-based participatory research in the Serchio Valley. SoC exhibited a significant, strong, and positive correlation with evaluations of both health and social services. Specifically, using a 10-point Likert scale for each variable, every unit increase in SoC was associated with a 49% increase in the odds of rating health services more positively, and a 57% increase for social services.

Several interconnected aspects may clarify the observed positive relationship between SoC and perceived service quality. Firstly, individuals with a higher SoC often benefit from more robust social support networks, which enhance their ability to navigate and utilize services effectively [36], likely influencing their perceptions of service quality. Additionally, a stronger community connection, combined with shared values, improves understanding of local issues and builds trust and satisfaction with local institutions and providers [56–58]. This, in turn, can enable more informed and contextualized feedback, leading to more favorable evaluations of services. Finally, heightened levels of reciprocity and responsibility foster a sense of ownership over local initiatives and services [59], potentially enhancing perceptions of service quality.

This study supports the hypothesized protective role of SoC in shaping interactions with health and social services, suggesting how SoC reflects the social resources that can be leveraged to address common challenges also in this context. Therefore, the findings emphasize the relevance of SoC in rural health and social care, with several critical implications informed also by existing research. The following insights can be viewed within the perspective of a paradigm shift necessary to secure the future accessibility and quality of public services in rural areas, where mounting challenges amplify demands and stretch available resources [1, 13, 18].

The most immediate implication is that policymakers and practitioners in rural health and social care can leverage SoC to enhance perceptions of service quality, offering valuable alternatives to strategies that may no longer be sustainable. Considering SoC's role in local capacity and broader social capital [39, 41, 42], this approach could potentially foster collaboration and involvement in collective efforts to improve local services. This, in turn, may create a virtuous cycle where a stronger SoC leads to both perceived and tangible improvements in service quality.

From a more prospective standpoint, SoC could support local communities in taking greater responsibility for their own care, as traditional providers struggle to meet growing needs. As summarized in previous literature reviews [60, 61], SoC fosters various forms of political and civic participation within communities. This effect may extend to other settings, with SoC acting as a catalyst for community engagement in health and social care as well. Engagement in this context can evolve along a continuum, starting with individual behavioral changes, progressing to collaboration with service providers, and ultimately leading to full empowerment, where key aspects of care—especially prevention and health promotion—are primarily managed by the community [21, 22]. However, further research is needed to explore these dynamics by empirically investigating how SoC relates to different levels and forms of community engagement [62].

This shift toward empowered communities also necessitates redefining the role of health and social care professionals. Traditionally, professionals have held most of the power in their relationships with users, overseeing care through a top-down approach. Several contributors have called for a shift from an assistance-based model to one where professionals serve as facilitators and co-creators of value [63–66], working alongside users and citizens to build proactive, more autonomous, and health-promoting communities [62, 63]. This evolution in professionals'

role closely aligns with the proposes centrality of SoC and serves as a key foundation for making SoC an actionable asset. However, further research is needed to explore how best to implement this significant transformation and clarify the respective roles and responsibility of professionals and community members in fostering a more participatory model of care. Additionally, SoC may hold added significance for professionals in rural areas, as recent research suggests that it could help improve their retention in these regions [67, 68]. Strengthening SoC could therefore be integrated with other strategies, such as telemedicine for remote care [69–71], and expanded practice and task shifting [72, 73], within a broader framework for building a stable rural workforce [16].

These direct and more prospective implications should elevate SoC within the current debate about the future of rural health and social care, encouraging policymakers and practitioners to reflect on strategies and activities that nurture and strengthen SoC. These approaches should be holistic, addressing citizens, care receivers, and professionals alike to yield wide-ranging benefits. In this light, SoC could be crucial in shaping a new season of rural health and social care policies aimed at ensuring the sustainable delivery of these services. Such policies should emphasize the proactive engagement of local communities and the transition of professional roles from sole providers to advocates and enablers of empowered communities. This shift from a passive assistance model to a proactive approach positions individuals and communities as the primary advocates for their health and well-being.

Analysis of the additional variables measured in this study, beyond adjusting for potential confounders, provided a more nuanced understanding that can better inform the development of strategies to enhance SoC. Specifically, younger individuals were found to have significantly lower levels of SoC, while better self-reported health, being raised in the Serchio Valley, and involvement in third-sector organizations were positively associated with SoC. These findings align with previous research [31, 74–76]. Regarding service evaluations, in contrast to their association with SoC, membership in third-sector organizations and being raised in the Serchio Valley (significant only for health services evaluations) were linked to poorer evaluations. Therefore, the following discrepancy was highlighted: membership in third-sector organizations and being raised in the Serchio Valley are positive predictors of SoC but negative predictors of service evaluations, while SoC itself is a positive predictor of service evaluations. A possible explanation of this discrepancy is as follows. While membership in third-sector organizations and being raised in the Serchio Valley positively contribute to a strong SoC, these factors may also make individuals more aware of the deficiencies and limitations of local services. Members of third-sector organizations, who work closely with traditional providers, often encounter firsthand the challenges and shortcomings of health and social services, potentially leading to more critical assessments and higher expectations, as they contribute to actual service deliver. Similarly, individuals raised in the Valley might have a long-term perspective on how services have evolved (or not) and thus may also have higher expectations and a more critical eye toward the quality of these services. In contrast, as shown, SoC promotes positive social support networks, connectedness, trust, and reciprocity, which can overall enhance the perception of service quality. The positive association between SoC and service evaluations likely reflects the general benefits of feeling integrated and supported within a community, which may outweigh the critical perspectives of members of third-sector organizations and long-term residents. However, these considerations warrant further investigation to fully understand the nuances of this relationship.

A final consideration is that this study does not intend to portray SoC as inherently "good." More precisely, it does not mean to suggest that SoC is a value in itself. As argued by McMillan [77], one of its leading experts, SoC is "a tool, not a value"—a morally neutral force that simply reflects individuals' sense of connectedness with others. This tool can serve as a protective resource for individual and collective health and well-being, as demonstrated by previous research and further supported by this study. However, SoC can also be socially problematic, particularly when it reinforces racial, religious, ethnic, social, or cultural identities in ways that foster division and entrench power among select groups [78]. For example, SoC has also been linked to the social exclusion of newcomers, such as migrants [79], as well as reduced return migration to rural areas and the stigmatization of those who do return [80]. Additionally, weak SoC can sometimes be adaptive, leading to positive outcomes in the context of risky communities [81], where strong social ties might reinforce harmful dynamics. While a full exploration of these complexities is beyond the scope of this study, acknowledging them provides important context. In this view, one possible additional interpretation of this study's findings is that individuals with strong SoC may have more positive perceptions of service quality partly because they have largely shaped their community's characteristics and, as a result, are more aligned with what it offers. These considerations open avenues for further research.

This research has several limitations. First, the study's focus on a single rural area, while illustrative of the specific characteristics and challenges faced by rural health and social care systems, may not be generalizable to other rural settings. Despite the proposed hypothesis,

the study design does not allow to determine the direction of the relationship between SoC and service evaluations. Positive perceptions of service quality may also enhance SoC. Future research should delve deeper into this relationship to better understand how these factors influence one another. Other limitations stem from the promotional strategy used for participant recruitment. Specifically, various formal and informal promotional channels were used, with outreach conducted by both the research team and local actors. While the goal was to reach as many citizens as possible and provide them with the opportunity to participate in the Population Experience Observatory, this approach likely did not ensure complete or systematic coverage. As a result, certain demographic groups may have been more exposed to the survey invitation than others, potentially influencing the sample composition. Additionally, the online format and self-enrollment mechanism of the survey pose challenges related to the digital divide and may have amplified self-selection bias, which is common in many survey-based studies. As described, the study sample cannot be considered fully representative of the broader population due to discrepancies in age and sex distribution compared to the Serchio Valley, as well as an imbalance in educational levels relative to the broader Lucca province. Comparing the findings of this study with existing research can provide context and help mitigate this bias. In line with previous studies, older age was significantly associated with a stronger SoC [31, 74], while higher educational levels correlated with poorer evaluations of health services [82–84]. Gender, on the other hand, did not show a significant association with either SoC or service evaluations, and it was not possible to identify clear patterns on these relationships from the literature. Nevertheless, the aim of this study was not to achieve broad representativeness or generalizability but to provide preliminary and novel insights into the relationship between SoC and the perceived quality of rural health and social services. These findings offer valuable contributions but remain exploratory, highlighting the need for further investigation that should also address these limitations.

Conclusions

This study highlights the significance of SoC in rural health and social care. Strengthening SoC emerges as a practical strategy for policymakers and practitioners to enhance perceptions of service quality, and, potentially, to improve actual service quality in the long run. From a prospective standpoint, SoC could act as a catalyst for community engagement, encouraging residents to take greater responsibility for managing their health and well-being. To fully realize SoC's potential, professionals should move from a traditional assistance-based role to one where they act as facilitators and promoters of empowered communities. The proposed paradigm shift is particularly relevant given the current escalating needs and increasingly strained resources in rural areas, which require innovative approaches to ensure effective service delivery. In this context, SoC could play a pivotal role in shaping future rural health and social care policies. Such policies should prioritize empowering local communities and redefining the roles of professionals to support this process. This shift positions local communities at the forefront of improving both individual and collective health, enhancing service effectiveness, building capacity and resilience, and ultimately ensuring the sustainable delivery of rural health and social services.

Abbreviations

SoC	Sense of Community
SNAI	Strategia per le Aree Interne (Italian Strategy for Inner Areas)
GDPR	General Data Protection Regulation
CI	Confidence Interval
AOR	Adjusted Odds Ratio
SD	Standard Deviation
p	p-value

Supplementary Information

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Supplementary Material 1.

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Find out more about the projects: https://www.proximitycare.it, https://www.tuscanyhealthecosystem.it.

Authors' contributions

Study conception and design (NS, SDR, and SN); Data collection (NS); Data analysis and interpretation (NS and SDR); Drafting the initial and revised versions of the article (NS); Critical revision of the article (SDR and SN); Final approval of the version to be submitted (NS, SDR, and SN).

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Data availability

The dataset generated and analysed during the current study is not publicly available due to privacy concerns but is available from the corresponding author on reasonable request.

Declarations

Ethics approval and consent to participate

This study was conducted in line with the ethical standards of the Declaration of Helsinki. Formal ethics approval was not required for the survey, in accordance with the national guidelines set by the Italian Data Protection

Authority (Guidelines on Processing Personal Data for Customer Satisfaction Surveys in the Healthcare Sector, https://www.garanteprivacy.it/home/docweb/-/docweb-display/docweb/3853781), as well as the assessment of the Data Protection Officer at the researchers' university. All participants provided informed consent to participate in the study.

Consent for publication
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Competing interests
The authors declare no competing interests.

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