

Social Media and Elderly People: Research Trends

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Abstract. Population aging is now a global reality a global reality, and interaction with social media as well. The older adult population is increasing significantly and their mental and physical health will be a worldwide priority. Social networks have been seen as an important ally to support older people. It is therefore important to know how the elderly population interacts with social media and the potential benefits and dangers in this interaction. This paper reports the results of a systematic literature review in the field of social media and the elderly. The analysis of the research papers focused on their research approach, methods of data collection, research domains, objectives and results. Our findings indicate that currently there is no predominant research approach for this field of study, samples are generally very small, research efforts are focused on specific domains, and there is a lacking of rigor in the reporting process. This work is important because it identifies the current state of research in this field and guides new potential research.

Keywords: Elderly · Social media · Literature review

1 Introduction

The world's population is aging. According to the United Nations [1], it is estimated that the number of older people will more than double between 2013 and 2050, from 841 million to more than 2,000 million. For 2047, it is expected that for the first time, older people will exceed the number of children. In turn, the older population is growing older. In 2013 the proportion of people over 80 years within the older population was 14% and it is projected to reach 19% by 2050. If so, by that year, there will be 392 million people over 80 years worldwide, which means more than three times the present amount.

As people age, their physical capacities begin to degenerate, they have limited mobility and their response time is much slower. Such a limitation in their mobility often results in less participation in social activities, which may tend to increase feelings of loneliness, and decrease morale and satisfaction with life [2, 3]. It is also well known that for the elder population, their health and well-being depends, to a greater extent, on the emotional and social relationships they have with their family members and friends [2, 4, 5]. Technology can play an important role helping the elderly to keep these social connections. It can improve their quality of life by reducing their sense of isolation,

contributing to their psychological well-being and sense of empowerment, and supporting their relationships regardless of time and location [2, 6–12].

As Hawkley and Cacioppo [13] argue, that finding ways to support older people in establishing and maintaining social connections should be a priority for public health. Older adults represent the fastest growing portion of the world's population [14], and their social needs can be satisfied through participation in social networks [7, 15]. Social networking has become a vital part of everyday life for many people. In recent years more and more older adults have begun to use social media [16–19]. According to Madden [20], from 2000 to 2009, there was a 70% increase in Internet use by people aged 50–64 years, and a 38% increase by those over 65 years; and during 2010 there was an increase of 88% in the use of social media by people aged 50–64 years, and a 26% increase by those over 65 years. However, in comparison to young people, the use of social media by older adults is still low [21, 22].

In the last decade there has been an increasing number of scientific publications presenting new ideas and methodologies on how social media can improve the quality of life of older adults [4, 9, 15, 23–35]. This paper presents a systematic review of studies on social media and older adults published between 2005 and 2016. We were interested in studying these papers from the research point of view, i.e. what kind of research approaches are been used with this population?, what kind of data collection methods?, what are the more prevalent research domains?, what are the main research goals and obtained results?, what do researchers point out as future work?

The remainder of this paper will proceed as follows: Sect. 2 will review the main theoretical concepts, while Sect. 3 will provide an overview of our study methodology. Section 4 presents the results, and Sect. 5 discusses the findings. The paper closes with concluding remarks in Sect. 6.

2 Related Concepts

2.1 Elderly People

Defining “old” is difficult and age classification may vary in different world regions and over time. The United Nations adopted the definition of older person as those aged 60 years or older [36]. Some organizations have separated the elderly population into three groups: the “young old” aged between 60 and 75; the “old old” aged between 75 and 85; and the “very old” with ages over 85 years [9]. There are also differences among the research community, some researchers consider older people those persons over 65 [2, 6], while others regards people over 60 years as elders [19, 37, 38]; for [30, 39, 40] the elderly is people who are over 55 years old, and [41, 42] consider as elderly people those aged over 50.

A growing concern related to the growth of the elderly population is social isolation [8, 13, 34, 35, 43–45]. According to Couture [43], 43% of people over 65 feel lonely on a regular basis and this feeling is related to a decrease in health or even premature death. Social isolation can be understood as a low quantity and poor quality of contact with other people. This includes the number of contacts a person has, his feelings of belonging, and how satisfactory his relationships and his engagements with others are [34].

2.2 Social Media

Even, when there is no agreed definition for social media, Obar and Wildman [46] identify four commonalities of current social media services: (1) They are Web 2.0 Internet-based applications; (2) Its lifeblood is user-generated content; (3) Individuals and groups create user-specific profiles; and (4) They facilitated the development of social networks online by connecting a profile with those of other individuals and/or groups. In sum, social media can be understood as internet-based applications that create links among users and user-generated content in online environments [46]. Social media applications can be used to interact with other people via blogs, web forums, social bookmarking sites, photo and video sharing communities, content communities, social networking sites, and virtual games with the goal to consume, co-create, share, and modify content generated by the same users [9, 31, 32, 47–50]. Some of the more popular social media nowadays are: Facebook, WhatsApp, LinkedIn, Skype, Google+, Instagram, Twitter and Snapchat [46].

2.3 Social Media and Elder People

Preventing and alleviating social isolation and loneliness is a key element in improving the quality of life of older adults. Information and communication technology (ICT), together with initiatives led by local communities or government agencies, can be used as a tool to help reduce feelings of loneliness and increase the mental well-being of older adults. The wide availability of mobile communications networks, smart phones and tablets, combined with social media applications, make it easier for elders to contact and share information with family and friends through text, voice and images [2, 9, 34, 51] with the potential to decrease loneliness and increase perceived social support, sense of belonging and feelings of connectedness [42, 45, 52, 53].

Social media can be even more useful for elders with limited mobility and for those who are no longer geographically close to family and friends because it may help, regardless of time and place, to maintain social connections that would otherwise be difficult to conserve [2, 50]. Besides this, the elderly population have recently shown a special enthusiasm for the adoption of new network tools that allow them to share, with a growing network of contacts, links, photos, videos, news and status updates [3, 7, 20, 54], and consequently improve their skills and opportunities for communication, information searching, knowledge sharing, and relationship building [9, 14].

In general, social media allows older adults to express themselves, participate in discussions and stay in contact with society [3]. Participating in social networks can empower older people and provide them with a sense of connectedness and greater control and self-efficacy [31]. An interesting trend in the use of social media by elders is health care. It can be a good source of health support. Patients can locate and obtain health-related information and services [34, 41]; they can give and receive information to manage specific diseases [17]; and establish relationships with health professionals for medical assistance [32].

On the other hand, the research community have also identified a number of educational, cognitive, physiological and experiential factors that may hinder the use of

social media by the elder population [3, 15, 17, 19, 29, 34, 53, 55–57]. Lee et al. [57] found four dimensions of constraints that elders experience while dealing with technology: intrapersonal barriers, structural barriers, interpersonal barriers, and functional barriers. They also found that these limitations were less restrictive for people with higher incomes and higher education, but perceived to be more restrictive as the age of users increased.

3 Methodology

To identify relevant studies, we searched relevant databases such as EBSCO, ACM, Scopus, Springer, Science Direct, JSTOR, Academic Search Complete, Emerald, ERIC, and Web of Science. We used the keyword social media with combinations of the following keywords: old people, elderly, seniors and older adults. This initial search returned a total of 88 articles. Then we repeat the same search in Google Scholar obtaining 78 articles. In overall the searching process returned 166 articles. To be included in the present review, an article needed to contain the selected keywords, and meet three inclusion criteria which are (A) include experiments, scientific studies, literature reviews or experiences with seniors in the use of social media tools; (B) explain the study methodology; (C) explain how social media was used, for example what kind of interaction they analyzed with Facebook, Twitter and so on.

In a first round the screening of the articles with respect to the inclusion criteria was performed independently by two authors. As a result, 28 articles were accepted for inclusion by both authors and 32 additional articles were accepted by only one of the authors. In a second round, a third author examined these 32 articles and accepted the inclusion of 14 of them. Subsequently, three articles were eliminated because the full-text version could not be obtained, (only the abstract), two for being posters (and no full papers) and one for being duplicated. In sum, 36 articles were included in the study for a full-text review (Appendix). After inclusion, the articles were analyzed with the following criteria: (1) article “demography”: publication channel (journal or conference), authors’ affiliation, and target audience; (2) aim of the study/research questions; (3) research approaches; (4) data collection methods; (5) main domains of research; (6) participants’ demography: number, gender, age, educational level; (7) main results and (8) future work.

4 Results

Unless otherwise noted, all the results presented in the following sections are based on 36 research papers ($N = 36$). To document the results, the numbers of the articles are shown as #paper Number, for example #5 refers to research paper #5 which in turn is the reference [30], according to the list in Appendix. In addition, in order to illustrate some of the categories or findings, we decided to use as examples the research papers which have a high number of citations, according to Google Scholar.

4.1 Publication Channel

Of the total of 36 articles analyzed, 26 articles (72%) were published in journals, and the remaining 10 articles (28%) were presented in conferences. The most cited journal articles (#55, #51, #129, #5), according to Google Scholar, were published in journals such as: Journal of Medical Internet Research, Educational Gerontology, Gerontology, and Decision Support Systems. On the other hand, the most cited conferences articles (#127, #112, #131) were presented in conferences such as: ACM Conference on Hypertext and Social Media, AMCIS (Association for Information Systems), and the International Conference on Universal Access in Human-Computer Interaction.

4.2 Geographical Distribution

Considering the author's affiliation indicated in the research papers, researchers from four of the six continents show an interest in investigating the relationship between social media and the elderly. The continent with the majority of studies in this research is Europe with fifteen papers, followed by the American continent with thirteen papers and finally Asia with eleven. On the other hand, continents like Oceania present only one article and there were no articles representing Africa and Antarctica.

The leading country on the American continent is United States with ten papers; other countries such as Mexico, Canada and Chile also contribute but with less strength. A different situation can be seen on the European continent, where a greater number of countries are represented, including: Norway, Italy, Scotland, Northern Ireland (United Kingdom), Switzerland, Sweden, France, Netherlands, Ireland, Spain, Finland, and Germany.

4.3 Disciplinary Areas

The disciplinary area was determined by the academic affiliation of the researchers. As it is expected due to the interrelation between social media and elders, the two disciplines with more representation are Computer Science (47%) and Health (25%); followed by Computational Design and Art and Design (14%). There are also some researchers coming from disciplines like Journalism, Economics, Education, Management and Human Resources. Only 4 out of 36 studies were interdisciplinary, for example, paper #131 was written by researchers in Industrial Design, Computer Science, and Physical Medicine and Rehabilitation.

4.4 Domain and Audience

Domain and audience are other interesting dimensions present in the literature of social media and the elderly. The domain dimension, obtained from the analysis of the keywords, allowed us to classify the research papers in three types of domains. The first type is related to elderly matters including keywords such as elderly, aging, adults, wisdom, privacy-preserving, communication, participation, peer influence and

information sharing. The second type of domain focuses on technology, software development and design. This is a technological domain that includes keywords such as social media, social network sites (SNS), Web 2.0, socio-technical systems, ICT, user experience, and requirements. The last type of domain is related to quality of life. Here, it is possible to find research papers with keywords such as social isolation, social inclusion, mental health, and elderly care assistance.

On the other hand, the audience dimension includes designers, researchers, policymakers, elderly care assistants, and elderly people itself. Table 1 contains the classification of the studies included in this research based on domain and audience. In each dimension we add an “Other” classification to locate those papers that do not include keywords to determinate their domain or for those cases where the analysis of the paper failed to figure out a specific audience.

Table 1. Domain and audience. N = 36

Audience	Domain			
	Elderly matters	Software dev. & design	Quality of life	Other
Designers	6-9-85-96-106-109-112-131-133-153	2-3-6-9-55-85-96-106-109-112-131-133-153	2-55-95-153	60-147-148-156
Researchers	5-6-98-106-153	5-6-37-55-98-95-106	55-98-95-153	156
Policymakers	90-98-115-118	90-98-99-115-118	98-99-115-118	15
Elderly care assistance	18-59-93-127-129-132-133	18-59-93-127-129-132-133	18-59-93-95-127-129	
Other	43-54-117	43-117	54	

Source: Author’s own work

Several research papers can be classified in several domains and audiences as well. Considering this, totals and percentages must be contrasted, exclusively, in relation to the total number of studies analyzed in this research. In the domain dimension, the technological domain contains the largest number of studies (29 out of 36, 80%), followed by the elderly matters domain (24 out of 36, 67%) and the quality of life domain (14 out of 36, 39%); 5 research papers out of 36 (14%) do not specified domain at all.

When it comes to the audience dimension, the analysis of the research papers included in this study allows to recognize that designers are the major audience identified (18 of 36, 50%), followed by researchers (10 out of 36, 28%), elderly care assistance (8 out of 36, 22%) and policy makers (6 out of 36, 17%). Finally, 3 out of 36 papers (8%) do not provide enough information to define an audience.

4.5 Age Segmentation

As we mentioned before there is not a global agreement about the age that defines an “older person” or how to segment this population. 12 papers out of 36 (33%) did not define the age of the population they considered. For the remaining 24 papers (67%) the age segmentation was diverse. Table 2 shows the age inferior limit the authors considered in their studies. These results confirm that there are is clear criteria to establish a minimum age to consider a person an older adult, and this lack of agreement among researchers may make it difficult to study this population and compare the research findings. In addition, few documents clearly define other characteristics of the sample, such as gender or educational level, the papers that do are papers #3, #5, #9, #106 and #105.

Table 2. Age segmentation. N = 36

Minimum age	40	45	50	55	60	65	70	85
Paper #	99	95	15–85–117– 127–153	5–96–106– 132–148	51–60–93– 98–115	37–54–59– 112–131	109	6

Source: Author’s own work

4.6 Defining Social Media

Only seven papers (19%) define the term “social media”, four of them were published in journals (#2, #51, #133, #147), and the other three (#95, #96, #156) were published in conferences. The general omission to define the term “social media”, presupposes, to some extent, that the authors assume that their audience is familiar with it, however in a subject where so many disciplines converge, the non-definition of the term can lead to different interpretations of the research findings.

4.7 Research Questions and Results

The classification of the research papers by using the research questions can be made based on two different dimensions. The first dimension is focused on the elderly people itself and consider three main research areas: influence and impact of social media on elderly people; use of social media technology to facilitate interaction between elderly people and other persons; and research related to the characteristics of elderly people that use, or potentially can use, social media artifacts. The second dimension is related to research focused on social media from a technological point of view. In this dimension it is also possible to identify three main perspectives: research oriented to design or assess social media technology; research dealing with the use of social media artifacts and, studies which are oriented to characterize social media technology.

Table 3 shows the classification of the 36 research papers on these two dimensions. Considering that results are connected to the research questions, this classification

Table 3. Research question and results. N = 36

Technological dimension	Elderly dimension		
	Influence and impact of social media on elderly people	Interaction between elderly people and others by social media	Characteristics of elderly people using social media
Design or assessment of social media artifacts	2–37–55–60	3–9–37–90	106–156–109
Use of social media artifacts	2–15–59–95–117–127	5–6–40–53–93–99–115–127–131–132	5–18–43–51–54–85–98–109–118–127–133–153–156
Characteristics of social media artifacts	129	112–147	51–96–109–153

Source: Author’s own work

allows us to synthesize in a clear and easy way both, the research questions and the corresponding results of the articles included in this literature study.

According to the data, the largest number of research papers belongs to the intersection of characteristics of elderly people using social media (elderly dimension), and use of social media artifacts (technological dimension). These 13 papers represent the 36% of the literature included in this review. As an example, the most cited article in this list is paper #51 which proposes two research questions. The first research question is related to the exploration of older adults’ perceptions about social media. The second research question is focused on the educational strategies that facilitate older adults’ learning of social media. The main results of this research indicate that, there is a clear concern of this population on privacy (characterizing the elderly users of social media), also, privacy was identified as the primary barrier to the adoption of social media applications.

It is clear from the results that the major concern of the researchers is the characterization of both the elderly and the applications of social media suitable for them. It is an emerging topic that requires further research.

4.8 Research Approaches and Data Collection Methods

Similar to the research questions and results, it is possible to classify the research papers included in this study by using two different dimensions. The first dimension is focused on their research approach. The second dimension is related to specific data collection methods or techniques used by the researchers. Considering this classification, some of the research approaches used in research on elderly and social media are user-centered participatory approach, case studies, exploratory studies, ethnographic studies, grounded theory approach, and literature reviews. On the other hand, the data collection methods, usually considered in research on elderly and social media are: observation, focus group, questionnaires, and interviews. Table 4 shows the results. In the “not explicit” category we locate the papers that do not explicitly declare the research method or data collection method used.

Table 4. Research approaches and data collection methods. N = 36

Research approach	Data collection methods					
	Observation	Focus group	Questionnaire	Interview	Systematic review	Not explicit
User-centered participatory approach	3	3	3–131	3–106		
Formative study				9		
Case study	37			37		
Exploratory study		51	153	112–132		
Ethnographic study	93–99			99		
Grounded theory approach				96		
Literature review					18–55–129–133	43–147
Training and other approaches	2	2	2			117–156
Not explicit	5–6–15–118	6–15–60–95–109–148	15–54–60–85–95–98–115–118–127–148	6–59–109–90		

Source: Author's own work

One of the predominant research approaches, explicitly declared by the authors, is literature review (6 out of 36, 17%) followed by exploratory studies (4 out of 36, 11%). However, the greater number of papers published on elderly and social media do not declare an explicit research approach. In the case of data collection methods, questionnaires are the instrument more used, followed by interviews, focus groups and observations.

From the data, we can see that elderly and social media research usually combine several techniques in order to triangulate results, for example papers #2, #3 and #15 use observation, focus groups and questionnaires.

In the research papers included in this study, there are six literature reviews (17%). Some of these literature reviews focus on the elderly and their typical problems of isolation and health (#18, #55), the use of social media by elderly people (#129) and economic or social context in elderly and social media (#43, #133).

4.9 Sample Sizes and Data Collection Methods

Another relevant issue to explore in the research papers is the sample size or number of participants. For our purposes, we only considered the elder participants, several papers mention the participation of other types of participants (e.g. young people, elderly care assistants, etc.), and these participants were not included in these results. In addition,

papers related to literature review studies were excluded in this section due to their nature. Considering this, the total number of papers included in this section are 30 (N = 30).

We defined two dimensions to present the results. The first dimension corresponds to the number of participants included in the studies. Here, we defined several ranges of number of participants in order to facilitate the analysis. The second dimension corresponds to the data collection methods that were presented in Table 4.

Table 5 shows the final results. Again, in the “not explicit” category we locate the papers that do not explicitly declare the number of participants or the data collection method used.

Table 5. Number of elderly participants and data collection methods. N = 30

Number of participants	Data collection methods				
	Observation	Focus group	Questionnaire	Interview	Not explicit
1–10	2–3–6–37–93–99	2–3–6–51–95–109	2–95	3–6–9–37–96–99–106–109–112	
11–100	15	15	3–15–85–98–127–131–153	132	
101–1000	5		54–148	59	
>1000			115		
Not explicit	118	60–148	60–118	90	117–156

Source: Author’s own work

In general, the sample sizes of the studies were small, the majority of them (13 out of 30, 43%) had between 1 to 10 participants and consistent with this sample size and the qualitative nature of these studies, the primary research methods used in these studies were interviews, focus groups and observation.

Questionnaires were more often used in the range of 11 to 100 participants. In general, 14 out of 30 studies (47%) use questionnaires. Two research papers (#3, #148) used different number of participants with different instruments, for example in paper #3, the authors considered 5 participants in experimental interviews and 60 participants in questionnaires.

4.10 Limitations in Research on Social Media and Elderly

As part of the analysis of the limitations found by the researchers on this area, it is interesting to mention that only in 20 out of 36 papers (56%), the authors reflected on the main limitations they faced in their studies. The largest number of papers (16 out of 20, 80%) established as their main limitation that the results make impossible the generalization and establishment of cause-and-effect relations due to the sample, either because it was very homogeneous, very small or biased. For example, in paper #51, the authors mentioned that in their study, the sample was very small, the participants were

predominantly African American females who had some computer experience, thus they suggest to do additional research addressing other groups to determine whether the results could be or not generalized.

4.11 Future Work

A very important aspect in a literature review is the analysis of the future work identified by the researchers. Of the total of 36 papers, 24 of them (67%) mentioned some ideas for future work. These ideas have been classified in three groups: (1) The largest number of research papers (17 out of 24, 71%) proposed the need to extend the present study in terms of the sample, the time of the study, the data collection methods or an analysis of another social media. For instance, in paper #5, the authors proposed to study the distrust of older adults to share information on social networks. The authors of paper #59 mentioned as future work, to extend the study to other mobile devices and in article #112, the authors proposed to analyze more deeply if the concerns of the elderly about privacy affects or not their online interaction; (2) Five articles (20%) propose the development of new social media applications geared to better meet the needs of older adults; and (3) Two studies (9%) propose new training strategies to get older adults to overcome their fears about privacy and security in social media applications.

5 Discussion

As it was established at the beginning of our paper, we were interested in studying the research papers in social media and elderly from the research point of view. Several questions were defined previous to initiate our research. In the same vein, we will use these questions to guide our analysis.

What kind of research approaches are been used with the elderly population?

Social media and the elderly are a relatively recent field of study, and knowing the current orientation of research, will provide guidance to future researchers interested in this topic. From our data it is possible to see that the predominant research approach among our sample is literature review. This type of research approach offers interesting research lines in emerging fields such as social media research and elders. Similar to our research, in general there is a clear interest in identifying future research lines on this field; the literature review research is a suitable method to establish what is already known and where new research is needed [58, 59]. In our study, we identified several research approaches. The results reveal that currently there is not a predominant research approach to address this subject. In reality, 15 papers out of 36 (42%) do not declare, explicitly, their research approach. This fact also may reveal certain lack of writing technical rigor by avoiding to explain something as fundamental as the research approach used. Additionally, there is a low number of articles that defined the term “social media” something that can be risky, because it leaves the audience with the responsibility of interpreting central concepts.

What kind of data collection methods are currently used in social media and elderly research? Questionnaires are the most frequently used method, followed by interviews, focus group and observation. The characteristics of the elderly, explain to some extent the methods of data collection used. Methods such as observation, focus groups and interviews use a small number of participants (from 1 to 10 participants). Probably, the own limitations of older people explain this sample limitation. Questionnaires allow for greater participation and are used more frequently in the range of 11 to 100 participants. The low number of participants in the studies analyzed can also be explained by the age segmentation. The identification of who belongs or does not belong to the group of older adults seems to depend on many cultural and social variables. On the other hand, 6 studies (out of 30) did not indicate the number of participants, which supports our previous finding about the lack of rigorous communication of results. Documenting the characteristics of the sample, especially the number of participants, is one of the central methodological aspects of any research.

What are the more prevalent research domains? The literature on social and elderly media extends among the three domains defined in our research. Most of the work (81%) contributes in the technological domain followed by the elderly matters domain (67%) and the domain of quality of life (39%). We can conclude that current research efforts in this field are of a very diverse nature which is consistent with our initial appreciation of how incipient research is in this field. Contrasting this matter with the audiences, the data reveals that designers are the main audience (50%), who are typically located in the technological domain cited above. This fact evidence a clear researchers' interest in proposing more suitable social media artifacts for the elderly. Other identified audiences were researchers, elderly care assistance and policymakers. These kinds of audiences were more focused on the elderly matters domain.

What are the main research goals and obtained results? In the technological dimension, a relevant number of research papers have research questions and results related to the use of social media artifacts. In the elderly dimension, the studies were mainly classified into the category of characteristics of elderly people using social media. This relation is understandable, use of social media artifacts drives characterization of their users, or viewed from the other angle, the elderly people characteristics need to be studied in order to research on their use of social media artifacts. In addition, it is possible to see that the technological domain and the elderly matters domain were primarily where researchers concentrated their efforts. Therefore, it is not surprising the relevant number of research papers belonging to the intersection of the characteristics of older people using social media (elderly dimension) and the use of social media artifacts (technological dimension). However, there is an incongruity between the number of studies related to "design or assessment of social media artifacts" in Table 3 and the number of articles oriented to designers as audience in Table 1.

What researchers point out as future trends? The analysis of future trends should first consider the limitations. A significant number of researchers have established as their main limitation that the results obtained are not generalizable because the sample used was very homogeneous, very small or biased. Thus, the main considerations on future work, as stated by the researchers, refer to do further research in terms of

improve sampling, research approaches, and data collection methods. These expectations clearly reflect a goal of increasing rigor in their research. In addition, from our point of view, there are some relevant research lines needed in order to understand better the impact of social media in the elderly population. We noticed that the quality of life domain has the lowest attention of researchers. Elderly population have special characteristics, as we cited before, these persons have limited mobility that results in less participation in social activities increasing feelings of loneliness and decreasing satisfaction with life [2, 3]. They also need to strengthen the emotional and social relationships with family members and friends [2, 4, 5]. Research oriented to increase elderly quality of life, should focus in understand the positive or negative impact of social media tools on elders and also guide social media designers in such way. In this regard, it is also important to consider design strategies based on approaches such as human-computer interaction and participatory design that will allow designers to propose social media tools more suitable for older people, taking into account their life situations, habits and attitudes, and physical and mental conditions. Future research efforts should also lead to greater integration between different disciplinary areas.

6 Conclusion

This paper reports the result of a systematic literature review in the field of social media and the elderly. Our study included 36 research papers, selected after an iterative process. Elders are the fastest growing population around the world and any effort oriented to improve their quality of life is important. Our findings show that there is currently no predominant research approach to address this field of study. Samples were generally small and questionnaires were the most common method of data collection. Many of the research efforts are focused on aspects of design, the interaction of the elderly with social media and how it affects their lives.

An interesting aspect we found was an informal approach to report results. Many papers do not define social media and an important number do not indicate the research approach nor the number of participants. Another difficulty is to clearly define who is an older adult.

Future work should be aimed at increasing the experience of researchers in the field, fostering interdisciplinary research processes, and a deeper understanding of the benefits of social media in older adults, and of aspects that complicate for them the use of these tools.

Appendix: Research Papers in the Study

In the following list we cross reference the paper number that we use in the tables and in the text with their correspondent number in the list of references (in square brackets), for example paper #2 corresponds to reference [32]: Spagnoletti, P., Resca, A., Sæbø, Ø.:

Design for social media engagement: Insights from elderly care assistance. *Journal of Strategic Information System*, vol. 24, no. 2, pp. 128–145 (2015). <https://doi.org/10.1016/j.jsis.2015.04.002s>.

2 [32]	51 [19]	96 [24]	127 [14]
3 [39]	54 [54]	98 [37]	129 [31]
5 [30]	55 [17]	99 [48]	131 [27]
6 [4]	59 [41]	106 [3]	132 [28]
9 [53]	60 [40]	109 [25]	133 [18]
15 [51]	85 [55]	112 [2]	147 [7]
18 [35]	90 [48]	115 [10]	148 [6]
37 [29]	93 [9]	117 [22]	153 [42]
43 [54]	95 [23]	118 [26]	156 [34]

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