Globalization, Technological Advancement and the Elderly People: A Systematic Review of Literature

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Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

Systematic Review Article

ABSTRACT

Old age comes with lots of challenges which become a burden to the able-bodied members of society and may cause physical and economic stress over the short and long term. Technology has catalysed development processes the world over for many decades now. It has affected the senior members of society in their everyday lives either negatively or positively. Existing research focused much on the impact of technology on old people from the perspective of caregivers and family members. This paper examines the impact of technology on old people using the available literature from the old people's perspective. International Bibliography of the Social Sciences (IBSS) and sociological abstracts (SOCAB) databases were used, and a total of 6 articles from a pool of articles generated were analysed. The study found that there are several assistive devices available to the ageing members which to a great extent gives them a sense of belonging to society in that it helps

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them keep their identity by being independent. It has also been found that old people are still sceptical about some of the devices as they are perceived to be invading their privacy. Furthermore, the paper proposes a future study on how social interaction can lead to successful ageing.

1. INTRODUCTION

Anything that happens has both a good and bad side, it's a matter of what a person is interested in. Globalisation has made the world more integrated making it a global village. By definition, globalisation is about doing away with the geographical boundaries between countries to allow the exchange and easier sharing of knowledge in all spheres of life [1]. This integration has come with many positive strands; of particular interest is the spread of technology.

Technology has spread and is still spreading at a faster rate. Much of this spread drastically improved in the past two decades [2]. It is being experienced by both the developing and developed countries. Just like the way climate change has not spared any country so is technology. It has penetrated the markets and everyone is talking about the new world being controlled by technology (robotics). Technology is being used in various places/ sectors such as communication, and learning for faster acquisition of knowledge, manufacturing, securing data, in scaling up businesses to remain competitive in the market. Much of the economic and social progress taking place in the world can be owed to the fact that human advancement and development have taken technology at the centre.

The importance of technology to human development cannot be overemphasized as it has helped in simplifying everyday life such as communication and boosting the economies [3]. There has been research done on the impact of technology on old people from the perspective of caregivers and family members. However, there hasn't been much and a clear consensus on the availability of assistive technology to senior citizens in their old age and how these technologies impact them, understanding the impact from their perspective.

This paper is referring to the elderly using the United Nations report [4] as any person who is or above the age of 60 years. The same report indicates that the number of aged people as of 2017 globally was over 962 million which is expected to double by the year 2050 [4]. This shows the urgency for a deeper understanding of assistive technology for old people. Once a person has grown old there are so many challenges that they are faced with, for instance, ill health ranging from hearing, movement and many others [5,6]. These deficits in the elderly are a burden to the able members of society which creates economic stress. Therefore with the emergency of technology, it is important to look at how technology has taken the elderly into account and see the kind of hope that technology has brought to the senior citizens using existing literature. It is for this reason that this research seeks to establish through the previous research how the aged are benefiting from technology brought by globalisation. It is being guided by the following research questions;

1. What technology is available and its implication for old people as depicted in the previous studies?

2. Old peoples' perspective on assistive technology to their ageing as shown in the previous studies?

2. METHODOLOGY

In answering the research question, a systematic approach to reviewing the existing literature centred on technology and age has been used. A systematic research review entails following a certain procedure which includes selecting certain databases and putting into consideration the inclusion, and exclusion criteria. It is about reinterpreting the existing literature on a given topic to add knowledge to the topic [7]. It is important to note that a systematic review allows other researchers to replicate the study because all the necessary traces are put forward.

In social sciences, we tend to only look at technology in terms of its effects on our social life and usually, we talk about it as having resulted from globalisation and not necessarily as a fully flagged topic or course. To familiarise me with the terms used when discussing technology,

more reading around the topic using the words globalisation, and technology with ageing had to be done. It is from here that the researcher got interested in understanding technology with ageing.

2.1 Choice of Data Bases

Since the interests were in scholarly articles, two databases were chosen to have much wider coverage of the literature review. Both the ProQuest database International Bibliography of the Social Sciences (IBSS) and Sociological Abstracts database (SOCAB) which the researcher thought were the best databases for the research as they contain scientific literature in social sciences, humanities and law and Subject areas in criminology, disability science, media and communication studies, public health sciences, social sciences, social work and sociology respectively. These two databases were, therefore, deemed relevant given the nature of the topic which is both healthy and sociological.

2.2 The Search Process

In the initial search for relevant articles, the following string in the International Bibliography of the Social Sciences (IBSS) was used to come up with some articles that would be of help (starting point) in the research topic;

Technology AND Elderly AND Assistive

In this search about 42 articles were found, of which 2 articles were selected for full-text reading and familiarised with the keywords used. In the quest to broaden the search, keywords and Boolean operators to the search strings were added.

2.3 Keywords and Boolean Operators

The idea of having these keywords and Boolean operators was to make sure that the articles that would be found at this point would be of help in tackling the main essence of the research [7]. At this point was more interested in articles that contain or discuss assistive technology for old people. Synonyms together with truncations (*) and Boolean operators (OR) were used to have a wider coverage. With these additions, the following search string was made;
(Technology OR Device* OR Digital) AND (Elder* OR Aged OR Aging OR Older* OR Senior) AND Assistive*.

2.4 Inclusion and Exclusion Criteria

2.4.1 Type of articles

During the search, articles that were peer-reviewed were included and only articles that were written in English because the research can only be read, understand and written in English so it was prudent that only articles in English be included. The year the articles were published was not important because the interest was in understanding how technology assists old people regardless of the year hence, all articles regardless of when it was published were included and this gave a wider coverage.

On exclusion criteria; all articles that defined elderly below the age of 60 were excluded because the researcher was relying on the definition by the United Nations report of 2016 which set 60 years and above as being old.

2.4.2 Selection of articles

The articles were selected based on three criteria; title, abstract and full-text reading [7]. If by reading the title, the article does not match the research interest they were straight away dropped. Secondly, by reading the abstracts many of the articles were dropped and a few articles were selected based on their relevance to the topic for full-text reading and some were dropped upon finding out that they were a bit off the topic in discussions.

Having established the final search string, it was first entered into the International Bibliography of the Social Sciences (IBSS). With inclusion and exclusion criteria taken into account, there were 73 hits, of which 13 were duplicates and they were sorted out and remained with 60. Exclusionary by Title 33 remained. These were subjected to full-text reading.

Using the same string, it was then entered into the sociological abstracts database (SOCAB) where there were 124 hits. Of these hits, 90 were duplicates and were sorted; from the entire search only 20 articles were picked for full-text reading. In total 53 articles were picked for the systematic review process. See the Fig. 1 showing the whole process undertaken.

From the diagram (Fig. 1), it can be seen that after the whole process of screening, only 6 articles from a total of 53 articles for systematic review were selected. The 6 articles were reviewed and analysed following the review protocol.
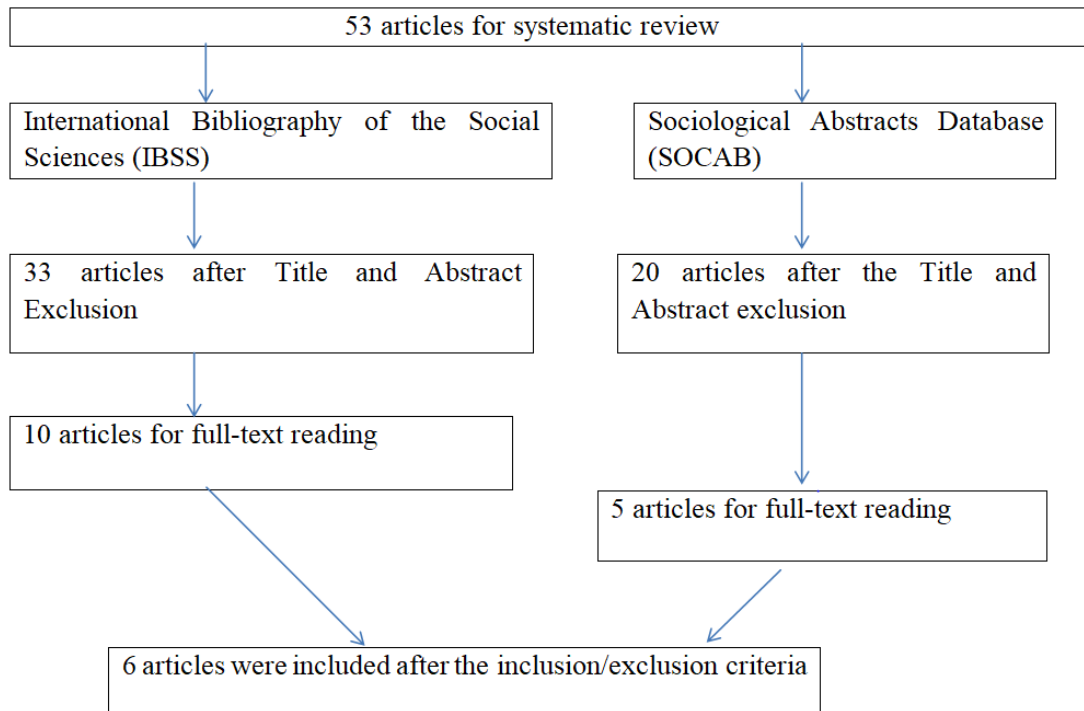
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│ International Bibliography of the │        │ Sociological Abstracts Database  │
│ Social Sciences (IBSS)           │        │ (SOCAB)                          │
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│ 33 articles after Title and      │        │ 20 articles after the Title and  │
│ Abstract Exclusion               │        │ Abstract exclusion               │
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│ 10 articles for full-text reading │        ┌──────────────────────────────────┐
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          │ 6 articles were included after the inclusion/exclusion criteria │
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Fig. 1. Summary illustration of the process

3. RESULTS

This section presents the findings made in this paper; the presentation of results is split into two main themes according to the specific questions. In the discussion, some synonym words were used. Words such as assistive technology or assistive device or technology were used alternatively. Also, words such as Old people or Older people or Elderly or Aged or Senior Citizen should be treated as synonyms in this paper, as such they were used to refer to anyone above the age of 60 as the minimum age that this paper has set according to the United Nations report of 2017.

The Table 1 is a summary of the selected articles used in answering the research questions. The topics and the findings have been presented in the original words of the respective writers.

3.1 Available Technology with Its Implications

As a person ages, there are several challenges that they may encounter because of frailty [8,9]. To help maintain the failing bodies, technology has come in place and plays a huge role in the many lives of the elders [10,11]. According to the reviewed literature, technology has to a great extent replaced human services offered to older people by significant others.

The selected articles show that there are different types of aid available to the senior members of society, it depends upon how the individual feels and their needs that will determine the kind of aid that can be made available to them [12]. This paper found that a smart home is one solution for ageing members. They are called smart homes because of sensors installed in homes which monitor the old people's daily activities [8,13]. The article done by McCreadie and Tinker, [12] uses the term Home-networking in referring to smart homes because of the way a house of old people is linked to computers which record and stores information for easier monitoring and communication with the rest of the family members in case of urgent attention or emergencies by old people. The articles suggest that the rise in the use of technology has been the result of shortages of personal assistant services PAS [14]. The read literature shows that there are several assistive devices available to the ageing members of society. I have categorised these into four categories; namely; hearing aids, mobility, vision and others.

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Table 1. Summary of the selected articles used in answering the research questions

Author	Article/Topic	Method	Findings of the Article
Lie et al. [9]	Technology and trust: older people's perspectives of a home monitoring system	This was a qualitative research which involved two sets of interviews (pre-trial and post-trial) about older people's perspectives on assistive devices in the United Kingdom	The research found that older people's habits and norms do not need to be disrupted by the ambient system, what is of importance is the relationship between an older person and her/his monitor based on trust as well as institutional providers who need to instil or earn trust.
Bradford et al. [8]	Watching over me: positive, negative and neutral perceptions of in-home monitoring Held by independent-living older residents in an Australian pilot study	Smart home pilot in Australia	The combination of considered placement of in-home technology, straightforward medical devices and a supportive human element will ensure that the technology meets the balance of service provision and preservation of dignity. Smart homes could mitigate the challenges associated with aged care while affording peace of mind for seniors and families.
Long [15]	Bodies, Technologies, and Aging in Japan: Thinking About Old People and Their Silver Products	Analysing the 2003-2007 Survey in Japan under the public long-term care insurance system that began in 2000.	Old people accept technology to avoid over-dependence on caregivers and resistance to limitations that come along with ageing.
Gitlin et al. [16]	Emerging Concerns of Older Stroke Patients About Assistive Device Use	This was a 20 monthly Survey in Philadelphia	Emerging meanings of assistive devices in the rehabilitation of stroke patients are complex as it depends upon the individual's interpretations and social judgement.
Anderson et al. [14]	The Impact of Assistive Technologies on Formal and Informal Home Care	The analysis of the National Long-Term Care Survey community-dwelling respondents receiving assistance with activities of daily living for 2004	Assistive technology helps replace personal assistance service (PAS) at the same time AT becomes complementary to formal PAS.
McCreadie and Tinker [12]	The acceptability of Assistive Technology to older people	Opinion surveys used semi-structured questionnaires in England and Scotland	The findings suggest a complex model of acceptability in which a felt need for assistance combines with product quality.

Under the Hearing category, literature shows that as a person ages, there is hearing deficits occur to their ears which other writers refer to as Presbycusis which is loss of hearing related to age. The articles show different devices that are available as a cover-up for hearing deficits in older people such as hearing aid, flashing alarm clocks as well as adaptors for television [14,15] these devices do enhance hearing in older people and help them face life with positivity.

In the second category, the articles reviewed show different assistive devices available for Mobility purposes; which range from crutches, wheelchairs, and trolleys as well as walking frames or sticks [8,15,16]. These are very instrumental when it comes to old people's mobility, without these devices, old people would become limited and may become dependent on personal assistant services which may reduce their autonomy. Literature also shows that there is a strong correlation between ageing and reduction in the strength and density of muscles and bones respectively, which makes it hard for old people to move independently and this generates the need for mobility devices. With the help of these assistive devices order people can do things on their own, move from one place to the other and do light jobs such as keeping their environment tidy [8,14,16].

The importance of Vision cannot be overemphasized by a human being. I can relate it to the importance of the sun to vegetation, and so is vision to the body. As people age their vision is weakened and literature shows that different vision aids help older people with their vision. These aids range from magnifying glasses, brailed equipment as well as sonic aid [15]. These aids are important as they help older people get along with their environment [12].

The last category is the combination of all other aids that do not belong to the above-mentioned. These are equally important to older people as they help the fraying bodies in different ways. These aids include bed poles and ladder, bath seat, toilet hoist as well as grab bars (long and acceptable). Literature is in agreement that all these categories discussed above, aim at giving the old people independence and autonomy amidst frailty which reduces dependence on other people [8,12,15,16]. At the same time, it helps older people to keep their identity and stay in their own homes with minimal challenges.

3.2 Old Peoples' Perspectives on Technology

The technology being discussed here is all which is centred on assisting the elders in their everyday life. This part addresses their perspectives (old people) over assistive technology being offered to them. It is important to know what literature has to offer because old people are the receivers and any impact that technology has on aging can best be illustrated by them. Meaning that in as much as their bodies are becoming frail, they still have a say in what is important and how modifications of the available devices to suit and meet their specific needs can be made [15].

Literature shows a mixture of feelings by the elders on assistive devices. Many of the articles show that elderly people receive assistive devices positively mainly because it helps them in maintaining their autonomy (old habits and norms) [8,9,15]. Autonomy has resulted in narrowing the gap between the environment and individual capacity such as performing certain tasks by older people. At the same time, assistive devices have improved their quality of life [12]. This makes them accept assistive devices at the expense of other factors that they complain of, such as privacy invasion. Old people's acceptance of these assistive devices is depended on the acceptance of their condition and the assistive devices' ability to maintain the old people's way of life even in old age.

Despite the positive responses, literature also shows that old people are still sceptical about these devices because they interfere with their normal lives, for instance, the sensors placed in homes make old people feel as if they are being observed all the time [9]. Their feeling of being monitored can make elders mimic behaviour so that the devices can record the positive side as they prove their independence [8]. This is an indication that even in old age independency and privacy still matter a lot to old people.

This paper also found that many old people prefer maintaining their relationships with their significant others instead of depending on technology. Some authors [9,12] note that assistive devices jeopardise social relationships. Almost everyone has these relations which can be more active during the need period, which in this case is old age, which technology is affecting. This is also an indication that old people believe (trust) more in being cared for by family members than technology.

To summarise the findings, it is clear that there are various assistive devices available to old people. These help them live an independent and honourable life. Literature has also shown that this independence brought by technology makes old people trade it with the negativity that it has such as privacy invasion. Their acceptance is based on the complexity of their fragility and trust in the assistive devices.

3.3 Ethical Considerations

None of the articles explicitly discusses ethical considerations. Nonetheless, it has been noted that some of the research conducted went through approval from the relevant research departments [8,9]. Some articles kept the responses of the respondents anonymous by using codes in place of names such as #3204204 [15,16]. This is important in keeping the identity of the respondents confidential and anonymous. The article on the impact of assistive devices was more of an evaluation of the 2004 National Long-term Care Survey; the excerpts were of ethical standard [14]. One of the articles did not seem to adhere to confidentiality and anonymity in that, they used the actual names of the respondents in their writing (p. 9) [12], if these names were not the real names at least the article should have indicated so.

Regarding ethical considerations in this paper, the research material used was the existing literature on the topic. The researcher made sure to present the analysis and findings as truthful and in line with research ethical guidelines. Equally, the researcher disclosed the sources of information for the sake of verifications in line with the Swedish Research Council [17].

4. CONCLUSION

In conclusion, this paper was synthesising the available literature on how technology has helped old people cope with their everyday lives, understanding it from the old people's perspective as the sole beneficiary of such technology. This paper observes that technology has been very instrumental and helpful to the senior members of society in their everyday situations, ranging from their movements, vision, and home-stay using smart homes as well as hearing. Despite the shortcomings, technology has replaced the demand for the services which were offered by the significant others to the ageing members of society hence giving ample time to significant others to focus on their everyday activities leading to more production in society. This paper finds that there are several assistive devices available to ageing members which to a great extent gives them a sense of belonging to society in that it helps them keep their identity by being independent. It has also been found that old people are still sceptical about some of the devices as they are perceived to be invading their privacy.

5. RESEARCH PROPOSAL

This paper was analysing the available technology to the ageing members of society and how it's helping them cope with everyday situations. Secondly, it addressed technology from the perspective of old people as the sole beneficiary of this technology using the available literature. This paper finds that there are several assistive devices available to aging members which to a great extent gives them a sense of belonging in that it helps them keep their identity by being independent. It has also been found that old people are still sceptical about some of the devices as they are perceived to be invading their privacy.

Having synthesised what research has to offer on this topic, the researcher was struck with another curiosity. As found in the literature old people require different attention in their old age. This entails that there is something that needs to be understood and this is an issue regarding disparities in their aging and the demand for assistive devices. For instance, while others require mobility assistive devices some require hearing aids some require multiple of these assistive aids.

The researcher, therefore, proposes research on how social interaction can lead to successful ageing. Using this research it would help understand these disparities. Successful ageing here doesn't mean a person is not going to grow grey hair or wrinkles. Rather reducing the chances of succumbing to depression may result from realising that an individual is no longer autonomous or determining the type and number of devices to use. In other words, successful ageing entails positive ageing. This would be achieved by incorporating the social theories of ageing such as activity, disengagement and continuity theories. This can further be strengthened by using Selective Optimization with Compensation (SOC) model which was advanced by Baltes and Baltes for understanding health and wellbeing in adulthood. This would help us understand how people age successfully with minimum frailty.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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