



Review Article

A Review on Role of Education and Learning in Enhancing Psychological Resilience in Later Years of Life

Hasan Ghodsi ^{1,2}, Zahra Azizabadi ³, Sara Sadat Hosseini ¹, Ensiyeh Mollanorozy ^{4,5*} 

¹ Healthy Ageing Research Centre, Neyshabur University of Medical Sciences, Neyshabur, Iran

² Department of Nursing and Midwifery, Neyshabur University of Medical Sciences, Neyshabur, Iran

³ Noncommunicable Diseases Research Center, Neyshabur University of Medical Sciences, Neyshabur, Iran

⁴ Department of Foreign Languages Teaching, ToH. C., Islamic Azad University, Torbat Heydarieh, Iran

⁵ Workplace Health Research Center, Neyshabur University of Medical Sciences, Neyshabur, Iran

Corresponding Author

Ensiyeh Mollanorozy, Ph.D
Candidate.

Department of Foreign Languages
Teaching, ToH. C., Islamic Azad
University, Torbat Heydarieh, Iran

✉ molanorozy@gmail.com

☎ +985143306201

 0009-0003-8321-4265

Article History

Received: Jul. 26, 2026

Accepted: Aug. 4, 2026

Published: Sep. 30, 2026

Keywords

Resilience, Education, Learning, Older
adults, Adaptation, Aging

Publisher

Neyshabur University of Medical Sciences

ABSTRACT

Background: The increasing aging population has drawn attention to factors affecting mental health and their adaptation. Therefore, the appropriate strategies should be provided for this population so that they can adapt to the challenges of old age. Education and learning in older adults contribute to enhancing psychological resilience and facilitate such adaptation. This review examines the role of educational participation in enhancing psychological resilience in older adults.

Methods: This study was conducted by searching PubMed, Scopus, Web of Science, and Google Scholar databases to identify the studies related to aging, psychological resilience resources, education, and learning. The available studies were analyzed and synthesized to investigate the association between educational participation and psychological resilience in the elderly.

Results: Findings showed that educational participation may help older adults adapt to the challenges through multiple pathways. The most reported mechanisms were social relationships, problem-solving, a sense of purpose and meaning in life, coping strategies for problems, self-efficacy and a sense of control, and self-confidence and a sense of competence. Overall, education and learning may help increase psychological resilience and ultimately promote healthy aging and psychological well-being by strengthening these psychological and social resources.

Conclusion: Education may help older adults to enhance resilience by boosting self-efficacy, sense of control, coping skills, social connections, and sense of purpose. Therefore, educational participation can support healthy aging and increase psychological resilience through potential pathways.

Introduction

The main challenge of aged populations is not only to increase the number of years of life, but also to provide conditions in which individuals can experience these years with psychological adaptation, a sense of meaning, and active social participation. Increased life expectancy, declining fertility rates, and advanced medical and social interventions have led to an increase in the number and proportion of older people in many societies (1). Nevertheless, increased

longevity alone does not necessarily guarantee healthy and satisfying old age (2). The later years of life may be associated with chronic diseases, functional limitations, bereavement, retirement, changing social roles, economic concerns, and reduced social participation. However, these challenges don't affect all older adults equally, some individuals may experience severe psychological disorders, while others can adapt to new conditions, maintain their well-being, and regain psychological balance after experiencing stressful events. This adaptive capacity is usually explained



by the concept of psychological resilience (3).

Resilience has received considerable attention in aging research in recent years. Among the theoretical perspectives explaining resilience, Richardson's resilience model conceptualizes resilience as a fixed individual characteristic and a dynamic process through which individuals gain the ability to adapt to problems, return to balance, and even grow after experiencing a crisis by utilizing their internal and external resources (4). In ageing, this adaptation process is influenced by a set of individual, social, and environmental factors that can strengthen individuals' capacity to face the changes and challenges of this period (5). A systematic review found that there are many different definitions of resilience, and most emphasize three main components: the presence of a stressor or adverse event, the individual's response to that event, and the resources and mechanisms that help individuals adapt. This describes resilience as a dynamic, context-dependent process rather than a fixed individual trait (6). The dynamic nature of resilience raises an important question: Can psychological resilience be enhanced through education and learning?

To answer this question, it can be stated that education and learning in older age have typically been examined in relation to cognitive health, social participation, and quality of life. Educational engagement refers to a broad range of learning experiences among older adults that include formal education (e.g., school-based courses), and informal learning (e.g., workshops and social learning programs, and self-directed study, art activities, and digital learning). This broad perspective recognizes learning as a lifelong process that extends beyond institutional education. A systematic review and meta-analysis reported that older adults' participation in formal educational or learning activities is associated with outcomes such as better cognitive function, greater life satisfaction, increased self-esteem, better quality of life, and a greater sense of belonging (7). However, the relationship between educational participation and psychological resilience has not yet been addressed as an independent and integrated issue.

Educational and learning activities may contribute to resilience from multiple perspectives. Learning can increase knowledge and skills to cope with stressful situations, enhance self-efficacy and a sense of control, provide opportunities for social interaction, stimulate cognitive and emotional activities, and help individuals experience greater meaning and purpose in life. Therefore, education is not simply a means of transmitting information, but can also serve as a psychological and social resource for coping with the challenges of aging (7, 8).

The purpose of this review is to examine the possible role of educational participation in enhancing psychological resilience in older adults. Rather than evaluating a specific educational intervention, this study aims to explain how learning help enhance resilience in the later years of life by combining theoretical perspectives and research evidence.

Methods

Given the purpose of this study, a conceptual approach was chosen to review the existing literature. To identify relevant studies, PubMed, Scopus, Web of Science, and Google Scholar databases were searched. The search was

conducted using a combination of keywords related to aging, psychological resilience, and education. The most important search terms included "older adults" OR "older people" OR "Aging" OR "Healthy Aging" AND "psychological resilience" OR resilience OR "psychological adaptation" OR "Well being" AND "education" OR "learning" OR "knowledge" OR "lifelong learning" OR "educational engagement" OR "educational activities" OR "learning engagement" OR "learning activities" OR "health education" OR "peer learning" OR "Group Learning" AND "Cognition" OR "Cognitive Function" OR "Self-Efficacy" OR "Sense of Control" AND "Coping Skills" AND "Social Participation". Also, references of relevant studies were reviewed to find other relevant sources. Included studies in this review addressed one or more of the following issues:

1. The concept and characteristics of psychological resilience in the elderly;
2. Factors affecting resilience in the later years of life;
3. The role of self-efficacy, sense of control, and coping skills in the adjustment of the elderly;
4. Participation of the older adults in educational and learning activities;
5. The relationship of learning with psychological well-being, cognitive function, and social participation;
6. The role of education and learning in adapting to the challenges and changes of aging.

Due to the nature of this article, the aim was not to comprehensively search, identify, and analyze all published studies in the manner of a systematic review. Instead, relevant and important data were reviewed to conceptually explain and thematically synthesize the available evidence. The study findings were categorized and analyzed based on main themes, including the role of education in increasing knowledge and skills, enhancing self-efficacy and sense of control, developing coping skills, increasing social connection, and enhancing meaning and purpose.

Review of Evidence

The concept of psychological resilience in old age

Resilience as A Dynamic Process

Psychological resilience is defined differently across various disciplines. Some researchers consider it a relatively stable individual characteristic, while others define it as a process or outcome of successful adaptation to difficult conditions (6, 9). This conceptual difference is important in the case of the elderly. Resilience in old age cannot be understood simply as a return to a previous state. Aging itself is accompanied by continuous physical, psychological, and social changes. Therefore, resilience does not involve "returning" to a previous state, but it refers to adapting to new conditions, rebuilding life, and developing new ways of functioning (6, 10). Based on a systematic review, resilience in the elderly involves exposure to a trauma or adverse event or condition, the individual's ability to respond to it, and the resources and mechanisms that enable adaptation to it. This view emphasizes the dynamic and context-dependent nature of resilience (6). Therefore, if resilience is a process related to adaptation, education and learning may influence this process by providing knowledge, skills, new perspectives



and social resources (7).

Resilience is not merely characterized by the absence of psychological distress

A misinterpretation of resilience is that a resilient person never feels sad, anxious, or stressed. Not only is this perception not consistent with new perspectives on resilience, but it is also recognized that a resilient older person may feel sad after the loss of a spouse, anxious during an illness, or confused after retirement. Resilience does not merely mean the absence of these feelings; rather, it refers to the capacity of a person to gradually adapt to the new conditions, finding new ways to continue living, and maintaining or regaining well-being (11). For example, an older adult who has lost his/her spouse may experience intense grief; thus, resilience does not mean the absence of grief, but may include the ability to adapt to loss, maintain connections with others, and rebuild meaning and purpose in life (12). Accordingly, educational programs or learning activities should not be designed to encourage older adults to avoid negative emotions or to force positive thinking. Education provides psychological resources and skills that help individuals better cope with the inevitable challenges of life (13, 14).

Resilience, Healthy Aging and Education

As previously stated, psychological resilience is considered an important capacity associated with healthy aging. A systematic review and meta-analysis of the relationship between resilience and successful aging showed a positive association between the two concepts, although there were differences in the definition and measurement of resilience across studies (15).

Resilience can contribute significantly to healthy aging. More resilient older adults may be more likely to maintain social relationships, engage in meaningful activities, seek help from others when needed, adapt to physical limitations, maintain a sense of purpose, use effective coping strategies, and feel a greater sense of control over their lives (16, 17). Education potentially strengthens several of these resources simultaneously (see Figure1).

Psychological resilience resources

The resources associated with psychological resilience can be broadly categorized into intrapersonal and interpersonal resources. Intrapersonal resources include self-efficacy, sense of control, coping skills, cognitive resources, and meaning and purpose in life, whereas interpersonal resources involve social connections, peer learning, and supportive learning environments.

Sense of Independence, Confidence and Agency

Unlike the traditional view, education and learning in older age are not merely associated with university or formal education, but older adults' educational participation take a wide variety of forms, including participation in university courses, community-based education programs, health education, digital skills training, language learning, learning about arts and cultural activities, self-management education,

peer-based learning, psychological group training, online courses, informal learning through social and community-based activities (18). Education should therefore be broadly understood as a process through which people acquire knowledge, develop new skills, reflect on their experiences, and connect with others.

This broad perspective is important because the psychological benefits of education are not limited to the academic content of a course, and the learning process itself can also affect older adults' mental health. For example, an older adult who learns a new language may gain greater self-confidence and opportunities for social interaction in addition to acquiring new cognitive skills. Similarly, an older adult who participates in a disease management program may gain a greater sense of control over their life and health status, in addition to increasing their knowledge about their illness. Although the extent to which educational participation enhances resilience may vary among older adults depending on individual characteristics, including baseline literacy, cognitive status, motivation, and available social support.

Self-Efficacy and Sense of Control

Self-efficacy is one of the most important mechanisms through which learning may contribute to resilience. According to Bandura's self-efficacy theory, the most important source of self-efficacy formation is the mastery experience. When older adults learn and practice a new skill, solve a problem, complete a task, and consequently see progress, receive positive feedback, and boost their self-confidence, their belief in their abilities strengthens. In fact, a person with higher self-efficacy sees challenges as manageable, not insurmountable. For older adults, this process is particularly important because aging may be associated with the experience of decreased control. Physical limitations, retirement, dependence on others, or chronic illnesses may reduce a person's sense of agency. Therefore, when educated older adults face such difficult events, they are more likely to adapt, and this is what is referred to in the resilience literature as successful adaptation (5, 19, 20). Learning creates a different experience: "I can still learn." This experience can be psychologically very important.

Developing Coping Skills

As previously defined, resilience is closely related to how people respond to stressful situations. Education may help strengthen resilience by teaching coping skills. These skills include problem-solving, stress management, emotion regulation, cognitive reappraisal, help-seeking, effective communication, planning, relaxation techniques, and acceptance of out-of-control situations. For example, an educational program can teach older adults to break down a complex problem into smaller, and more manageable steps—a skill that also help them with everyday problems. This skill can be used not only in the educational context, but also in dealing with other life problems (20-23). The process is described as follows:

Learning coping strategies → practicing strategies → increasing feelings of empowerment → responding more adaptively to stress



Meaning, Purpose, and Personal Growth

Learning may help to strengthen the resilience of older adults by fostering a sense of meaning and purpose (24). Many older adults, even in their later years, continue to seek personal growth, intellectual stimulation, creativity, and new experiences. Therefore, education and learning provide them with opportunities to continue to grow and progress, and give them a sense of usefulness, empowerment, and purpose (25, 26). This is important because aging is sometimes mistakenly viewed as just a stage of life that is associated with declining abilities and limitations, while older adults still have the capacity to learn, grow, and experience new things. As a result, participation in educational activities may help them to take a more active view of life and to be more adaptable and resilient in the face of the challenges and changes of aging.

Social Connection

Social connections play an important role in older adults' health, resilience, and well-being. Maintaining social relationships can provide important resources for coping in old age by providing emotional and practical support, enhancing a sense of belonging, and reducing the risk of loneliness and social isolation. In a study of resilience in old age, larger social network size and more positive quality of close relationships were associated with fewer depressive symptoms and greater life satisfaction in older adults who had experienced multiple negative events, a result that supports the role of social relationships as a protective factor in older adults' resilience (27). Additionally, a systematic review of factors associated with older adults' resilience to disasters identified social support and social networks as important factors associated with resilience (28). Therefore, social relationships may not only help reduce negative outcomes such as loneliness and social isolation, but also strengthen older adults' capacity to cope with and adapt to difficult situations by providing necessary support and resources. In this regard, educational programs contribute to resilience using educational content and social engagement. As illustrated by the examples above, English language and digital skills courses can teach both skills and social interaction. In such situations, the class itself is part of the intervention.

Mindfulness-Based Learning

Mindfulness-based programs help seniors better understand their thoughts and feelings, face these experiences more calmly instead of reacting to them immediately, and respond more appropriately to difficult situations. For this reason, mind-body approaches have been considered as one of the possible pathways to enhance resilience in older adults, as these programs help people better control their reactions when faced with stress and difficult situations. From an educational perspective, one of the important advantages of these programs is that participants are not only trained in the program sessions, but also learn skills and exercises that they can use independently and in their daily lives after the sessions. However, the effectiveness of these programs is not the same for everyone and depend on factors such as the

duration of the program, the number of sessions, the ability and skill of the trainer, the level of participation of the participants, and the continuation of the exercises after the program ends (29-32). The proposed conceptual model of the research and the potential role of education and learning in strengthening resources related to resilience in the elderly is presented in Figure 1.

How can education enhance psychological resilience?

An unknown situation can increase psychological stress. When people do not understand a situation or do not know how to deal with it, they may feel helpless and stressed. Education may reduce this uncertainty by providing appropriate information and strategies. For example, health education can help older adults learn more about symptoms of chronic diseases, and managing medications, doing proper physical activities, having suitable nutrition, communicating with health care providers, managing daily limitations. Although this knowledge does not eradicate the disease completely, it is able to reduce uncertainty and increase the individual's preparedness (20, 33-35). This process is illustrated as:

Knowledge → Better understanding → Reduced uncertainty
→ Greater preparedness → Better adaptation → Resilience

Thus, education may contribute to resilience by increasing the psychological resources available to an individual when faced with difficulties.

Learning as an Active Process

The possible relationship between learning and resilience becomes more important when learning is done in an active and participatory manner. Active learning provides opportunities to practice new skills, solve problems, receive feedback, overcome small challenges, interact with others, and experience personal growth. These experiences may help increase resilience by strengthening self-efficacy, which is a person's belief in their ability to manage and overcome challenges. (25, 36). For example, an older adult may initially believe that learning to use a smartphone is impossible. Then, through practice and gradual learning, she/he can acquire skills such as sending messages, making video calls or using online services. Experiencing success in learning and overcoming these challenges increases her/his self-efficacy and strengthens the belief that "I can learn new things and handle unfamiliar situations." This belief can be extended to other life situations and help the elderly to face new challenges with more confidence.

Self-Management Education

Older adults suffering from chronic conditions often have to deal with a variety of issues every day, such as symptoms, medication, lifestyle changes, and decisions about their health. Self-management education teaches them how to take a more active role in these situations. For example, to better control their symptoms, they take their medications correctly, communicate more effectively with health care professionals, set goals for their health, and make decisions about their own



care. This education is important not only in improving disease management, but also psychologically. Chronic diseases make individuals feel like their diseases are controlling their lives and they have little control over their situations. However, when older adults learn how to manage parts of their disease and daily lives, they feel in control of

their lives and decisions again and take an active role in their health care. This sense of control helps them better adapt to the challenges of chronic illness and become more resilient (37-40).

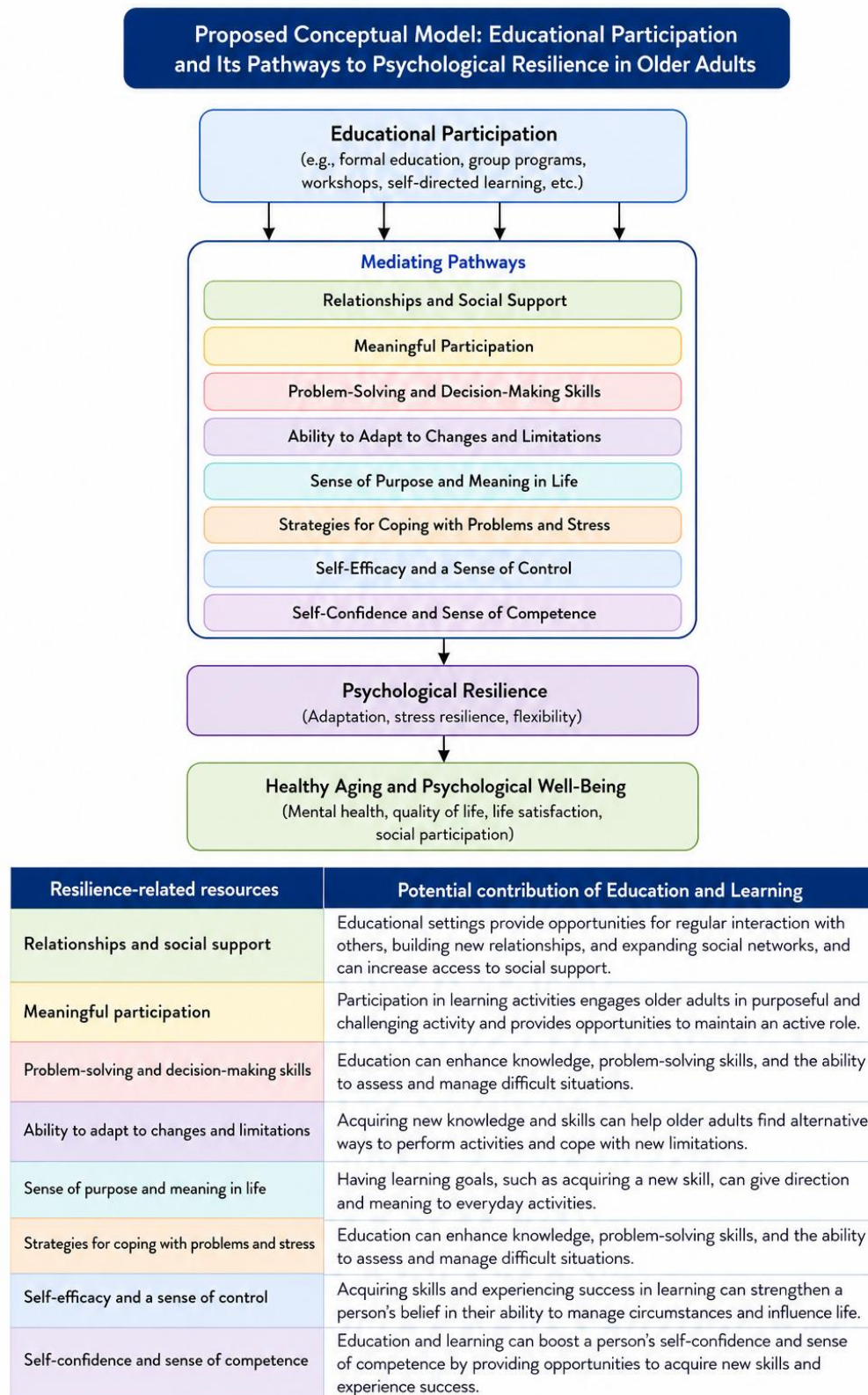


Figure1. Proposed Conceptual Model: Educational Participation and Its Pathways Psychological Resilience in Older Adults



Cognitive Stimulation and Strengthening Psychological Resources

Learning requires cognitive engagement. New learning experiences engage attention, memory, problem solving, creativity, and mental flexibility. This shows that learning is not only passively receiving information, but when older adults really learn something, their brains must actively work with the information (41). For example, if an older adult wants to learn how to use a smartphone, he/she must pay attention to explanations and steps, remember the steps, solve problems when they face them, and try new ways to do things, as well as use creativity, and be flexible if the previous method doesn't work (42-45). Moreover, to investigate the effects of learning a new language, studies found that engaging older adults in new and challenging activities over a six-month period improved their cognitive functions (41, 46, 47). These cognitive processes may indirectly support psychological resources associated with resilience, meaning that learning a new skill, especially when accompanied by an experience of success, helps older adults perform better; therefore, experiencing success in learning can theoretically work in the opposite direction of the negative beliefs of "I'm old, and I can't learn anymore" (42, 48, 49). However, evidence regarding the long-term effects of cognitive stimulation programs on psychological outcomes remains unknown, as their effectiveness may depend on factors such as intervention intensity, duration, participant engagement, and individual differences in cognitive status (50, 51).

Group training

Group training is particularly important for strengthening the psychological resilience of older adults, because in this type of training, the person also communicates with other people while learning new skills. Participants can share their experiences and problems and realize that they are not alone in facing these problems and others are also experiencing similar situations (52). In addition, they are able to learn new ways to deal with challenges by observing how others deal with challenges, receive feedback from other group members, and benefit from mutual support (53). Therefore, group training is not only an environment for transferring knowledge and training skills, but also provides a social space in which people can communicate, receive support, and learn from each other's experiences; factors that help strengthen psychological resilience.

Peer-based learning

In peer learning, individuals with similar conditions or experiences participate in the learning process. For older adults, this type of learning is helpful because they may feel that someone who has experienced similar conditions can better understand them. These types of programs encourage people to cope better with problems by creating shared experiences and mutual understanding. On the other hand, connecting with people who have similar experiences reduces feelings of loneliness and make an individual feel like they belong to a group (54-56).

Education as a Resource for Adapting to Changes in the Elderly

During old age, people may face a series of changes in their physical, mental, social, and daily life conditions, including retiring, experiencing grief, and losing social relationships.

Retirement

Retirement does not just mean the end of work; it also brings about significant changes in the life of an older adult, including losing a job, part of their previous identity, daily schedule, and communication with colleagues. As a result, they feel that they do not have a clear purpose in life (57). These changes make it difficult to adjust to retirement. Participation in educational activities helps the elderly to compensate for some of these gaps. For example, participating in a training course gives their life a regular schedule, provide an opportunity to meet and interact with other people, keep their mind active, and create opportunities for learning and personal growth. Also, they define new roles and goals for themselves by learning new skills. Thus, education can help older adults find new sources of identity, meaning, and purpose in life after retirement, rather than just seeing their previous identity and purpose as lost (25, 58).

Grief and loss of social relationships

The loss of a spouse, friends, or family member profoundly alters an older adult's social world. This means that an older adult may not only experience emotional grief after the death or loss of an important person, but may also experience a decrease in social relationships and daily activities, leading to increased loneliness (59).

Education cannot eliminate grief and loss and is not intended to replace the person who has been lost or cure grief, but educational environments provide opportunities to build new relationships and engage in meaningful activities. For example, an older adult in a classroom meets new people, interact with them, and pursue an activity that is interesting and valuable to them. This is important because resilience does not depend solely on an individual's own internal capabilities. An individual's social environment also influences their resilience. Therefore, if the older adult has the opportunity to establish new relationships and participate in meaningful social activities after experiencing loss, this supportive environment helps them better adapt to loss and life changes (60).

Technological changes

Technology is changing rapidly, and older adults who can't keep up with these changes may feel left behind or unable to take advantage of new opportunities like others. For example, many things can be done with a phone or the internet these days: video calling family, making doctor's appointments, checking bank accounts, accessing



government services, or finding health information. If older adults don't know how to use these technologies, they may become more dependent on others to do their daily tasks and feel less independent. Digital education helps them learn these necessary skills. As a result, they feel they still have the ability to learn and do new things "I can do this" and increase their sense of competence (42, 61, 62).

Critical Discussion

Evidence suggests that however the education can help to enhance the psychological resilience of older adults through a variety of pathways, all educational activities don't show to have the same effect. Activities that encourage older adults to actively learn, problem-solve, connect with others, and experience success are likely to provide greater opportunities to strengthen-related resources (63). Another important point is that resilience should not be viewed just as a result of education, older adults with greater social support, self-confidence, or a sense of empowerment may be more likely to participate in educational activities (64). Therefore, the association between education and resilience may be bidirectional, and education isn't necessarily interpreted a direct cause of increased resilience. Rather, education can be one of the effective and modifiable factors in supporting the resilience of older adults, but its effect also depends on the individual's conditions and the type of educational experience. This suggests that the value of education in old age is not just in transferring knowledge, but also in providing opportunities to stay active, learn, connect with others, and experience empowerment.

Conclusion

Psychological resilience is an important resource for older adults to adapt to changes and challenges in life. Although resilience is influenced by various individual, social, and environmental factors, education provides an important opportunity to acquire knowledge, skills, and psychological resources. Learning may help strengthen resilience by increasing self-efficacy, sense of control, coping skills, emotion regulation, social connection, and sense of purpose. From this perspective, education in older adults should not be limited to simply transferring information or filling free time. Learning is an active process that helps older adults acquire new abilities, communicate with others, adapt to changes, and feel that they are still able to grow and progress.

Therefore, educational participation can be considered one of the potential pathways to support healthy aging and enhance psychological resilience. Future programs should focus on the quality of the learning experience, active participation, social interaction, self-efficacy, and relevance of education to the real-life challenges of older adults, rather than focusing solely on educational content. Ultimately, learning represents not only a means of acquiring new knowledge, but also maintaining a sense of empowerment, purpose, and the possibility of growth in the later years of life.

Recommendations for Future Research

Future research should examine the relationship between educational engagement and psychological resilience more

directly, and identify which types and levels of educational engagement have the greatest impact on resilience. Also, examining the role of self-efficacy and social interaction, comparing group and individual learning, and assessing the capacity of digital learning to enhance resilience and reduce social isolation could help to understand this relationship better.

Acknowledgement

The authors declare that no funding was received for the preparation of this manuscript.

Funding

This research received no specific grant.

Ethical approval

This study is a review of previously published literature and does not involve primary data collection from human participants or animals. Therefore, ethical approval and informed consent were not required.

Conflict of Interests

The authors declare no conflicts of interest.

References

1. Gianfredi V, Nucci D, Pennisi F, Maggi S, Veronese N, Soysal P. Aging, longevity, and healthy aging: the public health approach. *Aging clinical and experimental research*. 2025;37(1):125. <https://doi.org/10.1007/s40520-025-03021-8>.
2. Brown GC. Living too long: the current focus of medical research on increasing the quantity, rather than the quality, of life is damaging our health and harming the economy. *EMBO reports*. 2015;16(2):137-41. <https://doi.org/10.15252/embr.201439518>.
3. Chmitorz A, Kunzler A, Helmreich I, Tüscher O, Kalisch R, Kubiak T, et al. Intervention studies to foster resilience - A systematic review and proposal for a resilience framework in future intervention studies. *Clinical psychology review*. 2018;59:78-100. <https://doi.org/10.1016/j.cpr.2017.11.002>.
4. Richardson GE. The metatheory of resilience and resiliency. *Journal of clinical psychology*. 2002;58(3):307-21. <https://doi.org/10.1002/jclp.10020>.
5. Windle G. What is resilience? A review and concept analysis. *Reviews in Clinical Gerontology*. 2011;21(2):152-69. <https://doi.org/10.1017/S0959259810000420>.
6. Angevaere MJ, Roberts J, van Hout HPJ, Joling KJ, Smalbrugge M, Schoonmade LJ, et al. Resilience in older persons: A systematic review of the conceptual literature. *Ageing research reviews*. 2020;63:101144. <https://doi.org/10.1016/j.arr.2020.101144>.
7. Noble C, Medin D, Quail Z, Young C, Carter M. How Does Participation in Formal Education or Learning for Older People Affect Wellbeing and Cognition? A Systematic Literature Review and Meta-Analysis. *Gerontology & geriatric medicine*. 2021;7:2333721420986027. <https://doi.org/10.1177/2333721420986027>.
8. Zhu M, Ding X, Gu J, Xie Y, Ding X, Li Z. Interventions for Improving Coping Strategies in Older Adults: A Systematic Review and Meta-Analysis. *Worldviews on evidence-based nursing*. 2025;22(4):e70068. <https://doi.org/10.1111/wvn.70068>.
9. Färber F, Rosendahl J. Trait resilience and mental health in older adults: A meta-analytic review. *Personality and mental health*. 2020;14(4):361-75. <https://doi.org/10.1002/pmh.1490>.
10. Baltes PB, Baltes MM. Psychological perspectives on successful aging: The model of selective optimization with compensation. *Successful aging:*



Perspectives from the behavioral sciences. New York, NY, US: Cambridge University Press; 1990. p. 1-34.

11. Rutten BP, Hammels C, Geschwind N, Menne-Lothmann C, Pishva E, Schruers K, et al. Resilience in mental health: linking psychological and neurobiological perspectives. *Acta psychiatrica Scandinavica*. 2013;128(1):3-20. <https://doi.org/10.1111/acps.12095>.
12. Wilson CA, Walker D, Saklofske DH. Developing a model of resilience in older adulthood: a qualitative meta-synthesis. *Ageing and Society*. 2021;41(8):1920-42. <https://doi.org/10.1017/S0144686X20000112>.
13. Richer MJ, Grenier S, Lupien S, Plusquellec P. Increasing stress resilience in older adults through a 6-week prevention program: effects on coping strategies, anxiety symptoms, and cortisol levels. *Frontiers in psychology*. 2024;15:1499609. <https://doi.org/10.3389/fpsyg.2024.1499609>.
14. Wu YC, Shen SF, Chen LK, Tung HH. A Web-Based Resilience-Enhancing Program to Improve Resilience, Physical Activity, and Well-being in Geriatric Population: Randomized Controlled Trial. *Journal of medical Internet research*. 2024;26:e53450. <https://doi.org/10.2196/53450>.
15. Trică A, Golu F, Sava NI, Licu M, Zăfirescu Ș A, Adam R, et al. Resilience and successful aging: A systematic review and meta-analysis. *Acta psychologica*. 2024;248:104357. <https://doi.org/10.1016/j.actpsy.2024.104357>.
16. Wilson CA, Plouffe RA, Saklofske DH. Assessing Resilience in Older Adulthood: Development and Validation of the Resilience Scale for Older Adults. *Can J Aging*. 2022 Jun;41(2):214-229. <https://doi.org/10.1017/s0714980821000155>.
17. Wu C, Li YX, Marron MM, Odden MC, Newman AB, Sanders JL. Quantifying and Classifying Physical Resilience Among Older Adults: The Health, Aging, and Body Composition Study. *The journals of gerontology Series A, Biological sciences and medical sciences*. 2020;75(10):1960-6. <https://doi.org/10.1093/geronol/gz247>.
18. Villar F, Celdrán M. Learning in later life: participation in formal, non-formal and informal activities in a nationally representative Spanish sample. *European journal of ageing*. 2013;10(2):135-44. <https://doi.org/10.1007/s10433-012-0257-1>.
19. Bandura A. Self-efficacy: The exercise of control. New York, NY, US: W H Freeman/Times Books/ Henry Holt & Co; 1997. ix, 604-ix, p.
20. Lorig KR, Ritter P, Stewart AL, Sobel DS, Brown BW, Jr., Bandura A, et al. Chronic disease self-management program: 2-year health status and health care utilization outcomes. *Medical care*. 2001;39(11):1217-23. <https://doi.org/10.1097/00005650-200111000-00008>.
21. Chojak A. Effectiveness of ACT-based intervention in compliance with the model for sustainable mental health: A cluster randomized control trial in a group of older adults. *Journal of Contextual Behavioral Science*. 2023;28:48-59. <https://doi.org/10.1016/j.jcbs.2023.03.007>.
22. Wu X, Li J, Zhang C, Zhou X, Dong X, Cao H, et al. The effects of modified problem-solving therapy on depression, coping, and self-efficacy in elderly nursing home residents. *Frontiers in psychology*. 2022;13:1030104. <https://doi.org/10.3389/fpsyg.2022.1030104>.
23. Richer MJ, Grenier S, Lupien S, Plusquellec P. Increasing stress resilience in older adults through a 6-week prevention program: effects on coping strategies, anxiety symptoms, and cortisol levels. *Front Psychol*. 2025 Jan 6;15:1499609. <https://doi.org/10.3389/fpsyg.2024.1499609>.
24. AshaRani PV, Lai D, Koh J, Subramaniam M. Purpose in Life in Older Adults: A Systematic Review on Conceptualization, Measures, and Determinants. *International journal of environmental research and public health*. 2022;19(10). <https://doi.org/10.3390/ijerph19105860>.
25. Narushima M, Liu J, Diestelkamp N. Lifelong learning in active ageing discourse: its conserving effect on wellbeing, health and vulnerability. *Ageing Soc*. 2018;38(4):651-75. <https://doi.org/10.1017/s0144686x16001136>.
26. Jenkins A, Mostafa T. The effects of learning on wellbeing for older adults in England. *Ageing and Society*. 2015;35(10):2053-70. <https://doi.org/10.1017/S0144686X14000762>.
27. Fuller-Iglesias H, Sellars B, Antonucci TC. Resilience in Old Age: Social Relations as a Protective Factor. *Research in Human Development*. 2008;5(3):181-93. <https://doi.org/10.1080/15427600802274043>.
28. Timalina R, Songwathana P. Factors enhancing resilience among older adults experiencing disaster: A systematic review. *Australasian emergency care*. 2020;23(1):11-22. <https://doi.org/10.1016/j.auec.2019.12.007>.
29. Verhaeghen P, Aikman SN, Mirabito G. Mindfulness Interventions in Older Adults for Mental Health and Well-Being: A Meta-Analysis. *The journals of gerontology Series B, Psychological sciences and social sciences*. 2025;80(4). <https://doi.org/10.1093/geronb/gbae205>.
30. Wu YC, Shen SF, Lee SY, Chen LK, Tung HH. The effectiveness of mind-body approaches for enhancing resilience in older adults: A systematic review and network meta-analysis. *Archives of gerontology and geriatrics*. 2023;109:104949. <https://doi.org/10.1016/j.archger.2023.104949>.
31. O'Connor M, Stapleton A, O'Reilly G, Murphy E, Connaughton L,

- E, et al. The efficacy of mindfulness-based interventions in promoting resilience: A systematic review and meta-analysis of randomised controlled trials. *Journal of Contextual Behavioral Science*. 2023;28:215-25. <https://doi.org/10.1016/j.jcbs.2023.03.005>.
32. Zhang J, Mao Y, Wang Y, Zhang Y. The relationship between trait mindfulness and resilience: A meta-analysis. *Personality and mental health*. 2023;17(4):313-27. <https://doi.org/10.1002/pmh.1581>.
33. Mishel MH. Uncertainty in illness. *Image the journal of nursing scholarship*. 1988;20(4):225-32. <https://doi.org/10.1111/j.1547-5069.1988.tb00082.x>.
34. Huang Y, Li S, Lu X, Chen W, Zhang Y. The Effect of Self-Management on Patients with Chronic Diseases: A Systematic Review and Meta-Analysis. *Healthcare (Basel, Switzerland)*. 2024;12(21). <https://doi.org/10.3390/healthcare12212151>.
35. Kim SH, Youn CH. Efficacy of Chronic Disease Self-management Program in Older Korean Adults with Low and High Health Literacy. *Asian Nursing Research*. 2015;9(1):42-6. <https://doi.org/10.1016/j.anr.2014.10.008>.
36. Gegenfurtner A, Vauras M. Age-related differences in the relation between motivation to learn and transfer of training in adult continuing education. *Contemporary Educational Psychology*. 2012;37(1):33-46. <https://doi.org/10.1016/j.cedpsych.2011.09.003>.
37. Cheng C, Chen X. The Mediating Role of Resilience in the Association Between Self-Efficacy for Medication Management and Psychological Distress in Older Adults. *Clinical nursing research*. 2026;35(2-3):75-83. <https://doi.org/10.1177/10547738261429342>.
38. Jerant A, Moore M, Lorig K, Franks P. Perceived control moderated the self-efficacy-enhancing effects of a chronic illness self-management intervention. *Chronic Illn*. 2008;4(3):173-82. <https://doi.org/10.1177/1742395308089057>.
39. Jonker AAGC, Comijs HC, Knipscheer KCPM, Deeg DJH. Benefits for elders with vulnerable health from the Chronic Disease Self-management Program (CDSMP) at short and longer term. *BMC Geriatrics*. 2015;15(1):101. <https://doi.org/10.1186/s12877-015-0090-4>.
40. Elzen H, Slaets JJP, Snijders TAB, Steverink N. Evaluation of the chronic disease self-management program (CDSMP) among chronically ill older people in the Netherlands. *Social Science & Medicine*. 2007;64(9):1832-41. <https://doi.org/10.1016/j.socscimed.2007.02.008>.
41. Brouwer J, van den Berg F, Knooihuizen R, Loerts H, Keijzer M. The effects of language learning on cognitive functioning and psychosocial well-being in cognitively healthy older adults: A semi-blind randomized controlled trial. *Neuropsychology, development, and cognition Section B, Aging, neuropsychology and cognition*. 2025;32(2):270-306. <https://doi.org/10.1080/13825585.2024.2384107>.
42. Lagana L. Enhancing the Attitudes and Self-Efficacy of Older Adults Toward Computers and the Internet: Results of a Pilot Study. *Educational gerontology*. 2008;34(9):831. <https://doi.org/10.1080/03601270802243713>.
43. Park DC, Lodi-Smith J, Drew L, Haber S, Hebrank A, Bischof GN, et al. The impact of sustained engagement on cognitive function in older adults: the Synapse Project. *Psychological science*. 2014;25(1):103-12. <https://doi.org/10.1177/0956797613499592>.
44. Chung S, Kim BR, Moon S, Kim GH. Effects of a 12-Week Hybrid Analog-Digital Cognitive Training on Cognitively Unimpaired Older Adults: A Pilot Single-Blind Randomized Controlled Trial. *Dementia and neurocognitive disorders*. 2025;24(4):301-10. <https://doi.org/10.12779/dnd.2025.24.4.301>.
45. Wilson-Menzfeld G, Gates JR, Moreland M, Raw H, Johnson A. Learning digital skills online: empowering older adults through one-to-one, online digital training provision. *Front Psychol*. 2023 May 5;14:1122277. <https://doi.org/10.3389/fpsyg.2023.1122277>.
46. Wong PCM, Ou J, Pang CWY, Zhang L, Tse CS, Lam LCW, et al. Language Training Leads to Global Cognitive Improvement in Older Adults: A Preliminary Study. *Journal of speech, language, and hearing research : JSLHR*. 2019;62(7):2411-24. https://doi.org/10.1044/2019_jslhr-1-18-0321.
47. Che Y, Huang L. Foreign language learning for active aging: Cognitive and psychosocial benefits of Chinese older adults learning English. *Educational gerontology*. 2026;1-18. <https://doi.org/10.1080/03601277.2026.2647775>.
48. Levy BR, Pilver C, Chung PH, Slade MD. Subliminal strengthening: improving older individuals' physical function over time with an implicit-age-stereotype intervention. *Psychological science*. 2014;25(12):2127-35. <https://doi.org/10.1177/0956797614551970>.



49. Hess TM, Auman C, Colcombe SJ, Rahhal TA. The impact of stereotype threat on age differences in memory performance. *The journals of gerontology Series B, Psychological sciences and social sciences*. 2003;58(1):P3-11. <https://doi.org/10.1093/geronb/58.1.p3>.
50. Gómez-Soria I, Iguacel I, Cuenca-Zaldivar JN, Aguilar-Latorre A, Peralta-Marrupe P, Latorre E, et al. Cognitive stimulation and psychosocial results in older adults: A systematic review and meta-analysis. *Archives of gerontology and geriatrics*. 2023;115:105114. <https://doi.org/10.1016/j.archger.2023.105114>.
51. Reijnders J, van Heugten C, van Boxtel M. Cognitive interventions in healthy older adults and people with mild cognitive impairment: a systematic review. *Ageing research reviews*. 2013;12(1):263-75. <https://doi.org/10.1016/j.arr.2012.07.003>.
52. Treichler EBH, Glorioso D, Lee EE, Wu T-C, Tu XM, Daly R, et al. A pragmatic trial of a group intervention in senior housing communities to increase resilience. *International Psychogeriatrics*. 2020;32(2):173-82. <https://doi.org/10.1017/s1041610219002096>.
53. Lai DWL, Li J, Ou X, Li CYP. Effectiveness of a peer-based intervention on loneliness and social isolation of older Chinese immigrants in Canada: a randomized controlled trial. *BMC Geriatr*. 2020;20(1):356. <https://doi.org/10.1186/s12877-020-01756-9>.
54. Chen W-C, Kuo C-C, Lin C-C, Wu C-C. A preliminary study on the effects of the Peer-Led Self-Management (PLSM) program on self-efficacy, self-management, and physiological measures in older adults with diabetes: A block randomized controlled trial. *Geriatric Nursing*. 2021;42(2):386-96. <https://doi.org/10.1016/j.gerinurse.2021.01.011>.
55. Joo Jh, Xie A, Choi N, Gallo JJ, Zhong Y, Ma M, et al. A Mixed Methods Effectiveness Study of a Peer Support Intervention for Older Adults During the COVID-19 Pandemic: Results of a Randomized Clinical Trial. *The American Journal of Geriatric Psychiatry*. 2025;33(4):389-401. <https://doi.org/10.1016/j.jagp.2024.09.013>.
56. Lai DWL, Li J, Ou X, Li CYP. Effectiveness of a peer-based intervention on loneliness and social isolation of older Chinese immigrants in Canada: a randomized controlled trial. *BMC Geriatrics*. 2020;20(1):356. <https://doi.org/10.1186/s12877-020-01756-9>.
57. Shin O, Park S, Kim B, Wu CF. Retirement Transition Sequences and Well-Being Among Older Workers Focusing on Gender Differences. *Journal of gerontological social work*. 2025;68(4):415-45. <https://doi.org/10.1080/01634372.2024.2413880>.
58. Istance D. Learning in Retirement and Old Age: an agenda for the 21st century. *European Journal of Education*. 2015;50(2):225-38. <https://doi.org/10.1111/ejed.12120>.
59. Carr D, House JS, Kessler RC, Nesse RM, Sonnega J, Wortman C. Marital quality and psychological adjustment to widowhood among older adults: a longitudinal analysis. *The journals of gerontology Series B, Psychological sciences and social sciences*. 2000;55(4):S197-207. <https://psycnet.apa.org/doi/10.1093/geronb/55.4.S197>.
60. Li X, Ge T, Dong Q, Jiang Q. Social participation, psychological resilience and depression among widowed older adults in China. *BMC Geriatr*. 2023;23(1):454. <https://doi.org/10.1186/s12877-023-04168-7>.
61. Lee H, Lim JA, Nam HK. Effect of a Digital Literacy Program on Older Adults' Digital Social Behavior: A Quasi-Experimental Study. *International journal of environmental research and public health*. 2022;19(19). <https://doi.org/10.3390/ijerph191912404>.
62. Zhao X, Wang L, Ge C, Zhen X, Chen Z, Wang J, et al. Smartphone application training program improves smartphone usage competency and quality of life among the elderly in an elder university in China: A randomized controlled trial. *International journal of medical informatics*. 2020;133:104010. <https://doi.org/10.1016/j.ijmedinf.2019.104010>.
63. Wu YC, Shen SF, Chen LK, Tung HH. A Web-Based Resilience-Enhancing Program to Improve Resilience, Physical Activity, and Well-being in Geriatric Population: Randomized Controlled Trial. *Journal of medical Internet research*. 2024;26:e53450. <https://doi.org/10.2196/53450>.
64. Sun J, Sugisawa H. Predictive power of psychosocial factors on learning practices among older Japanese adults based on organismic integration theory. *Educational gerontology*. 2025;51(8):916-24. <https://doi.org/10.1080/03601277.2024.2418395>.

