Review Article

A Virtual Solution to Social Isolation in the Asian American Geriatric Community Post Covid-19 Pandemic

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Abstract

The COVID-19 pandemic highlighted and deepened key aspects of social gerontology, including mental health, mobility issues, and social isolation among elderly Asian Americans. This study examines the compounded effects of loneliness stemming from mobility limitations, health concerns, and heightened xenophobia during the pandemic, which have increased susceptibility to mental health issues such as depression, anxiety, and overall health decline. Existing solutions, including senior centers and generic applications, fail to adequately address the cultural and linguistic needs of Asian American seniors.

To address these gaps, this study introduces *"Bloom,"* an application targeted at geriatric Asian Americans. The *Bloom* interface comprises a mood tracker, recreational and cultural classes, games, chat rooms, and a location tracker to enhance socialization, well-being, and safety. Activities such as tai chi, knitting, mahjong, and karaoke are incorporated to align with cultural preferences, and the app's bilingual functionality mitigates language barriers.

A pre-designed survey consisting of 37 Chinese-speaking seniors from Los Angeles was surveyed prior to designing the app to understand their preferences and barriers to social activities. Following this, a pilot study with ten beta testers demonstrated the app's efficiency. Results demonstrated enhanced levels of social interaction, cognitive stimulation, and favorable user feedback, indicating the app's potential as a multipurpose solution to social exclusion.

This study supports the need to incorporate culturally sensitive technology interventions in combating social isolation among the elderly. *Bloom* aims not only to build caring interpersonal relationships but also to promote mental well-being and physical health. This work provides a roadmap for how digital innovation can support rights and appropriate care for marginalized senior groups. Future versions of the app should be designed to address the needs of other cultural groups, fulfilling its potential to meet the diverse needs of the aging population.

<u>Keywords:</u> *Social Isolation, Elderly Asian Americans, Culturally Tailored Technology, Mental Health Challenges, Bloom Application, Cognitive Engagement, COVID-19 Pandemic.*

1.0 Introduction

Social isolation has become a pervasive issue among the elderly population, particularly Asian Americans, due to a confluence of cultural, linguistic, and structural factors. This challenge has been exacerbated by the COVID-19 pandemic, which introduced heightened health risks, social restrictions, and a surge in anti-Asian violence. Such isolation carries severe consequences, ranging from physical health risks like cardiovascular diseases to mental health challenges such as depression and anxiety (CDC, 2021).

1.1 Why Social Isolation Must be Addressed
Social isolation and loneliness are increasingly recognized as critical public health issues for older adults. According to the National Institute on Aging (2019), social isolation is defined as *"having a low quantity and quality of contact with others,"* while loneliness refers to a subjective feeling of being alone. Asian American seniors face compounded risks due to cultural stigma, language barriers, and racism, leading to significantly higher levels of social isolation compared to other senior groups (Lai et al., 2020).

1.2 Worsening as a Result of Covid-19
The COVID-19 pandemic introduced new challenges to social interaction among elderly Asian Americans. Beyond health concerns, elderly individuals faced heightened fear due to the sharp rise in anti-Asian hate crimes. The Stop AAPI Hate organization recorded over 820 hate attacks on elderly Asian Americans between March 2020 and December 2021 (Jeung et al., 2022). This fear resulted in aversive

behaviors, including avoiding public spaces and social interactions (Quach et al., 2021). These findings emphasize the need for culturally sensitive programs targeting both the practical and psychological dimensions of loneliness.

Another significant set of obstacles affecting Asian American seniors includes communication barriers, limited English proficiency, and a lack of culturally competent materials. According to U.S. Census data, over 65 million Americans have limited English fluency, which significantly reduces social interaction and access to health services (Z & B, 2015). Cultural illnesses such as *'hwa-byung,'* a Korean term for stress and frustration, are often overlooked by Western healthcare systems, further exacerbating mental health challenges (Jeung et al., 2022). Moreover, social stigmas surrounding mental health prevent many seniors from seeking support, worsening their isolation (Lai et al., 2020).

1.3 Transportation and Health as Factors that Influence Disability

Transportation barriers significantly contribute to social isolation. Inadequate and unsafe public transportation systems in cities like Los Angeles limit seniors' mobility, in stark contrast to countries like Japan, where senior-friendly transit systems are in place (Georgia Tech, n.d.). Chronic illnesses, such as arthritis and cognitive disabilities, further restrict mobility and social participation (National Academies of Sciences, Engineering, and Medicine, 2020).

1.4 The Role of Technology

Technology offers potential solutions for social connection, as demonstrated during the COVID-19 pandemic. However, many current platforms, such as Facebook and Lumosity, do not cater to the cultural and linguistic needs of elderly Asian Americans. For example, Lumosity focuses on cognitive fitness but lacks cultural representation, while Televëda provides virtual activities but does not offer bilingual support (Fratiglioni et al., 2004; Televeda, n.d.).

1.5 Purpose of the Study

This research aims to design and implement a culturally sensitive solution to address social isolation among elderly Asian Americans. *Bloom* offers an opportunity to enhance communication, cognitive activity, physical fitness, and mental health through tailored virtual tools.

1.6 Research Objectives

The central objectives of this study are:

- To assess the level of social isolation among elderly Asian Americans.
- To explore how virtual platforms alleviate or exacerbate social isolation and mental health challenges.
- To develop culturally targeted interventions via an app tailored to the needs of this population.

Through achieving these objectives, this research will help advance the discussion on geriatric mental health and social connection in the context of post-pandemic interventions and interventions.

2.0 Literature Review

Thus, social isolation is a complex problem, which concerns elderly people, especially Asian American seniors due to cultural and linguistic barriers and systemic factors. The literature identifies key findings about the antecedents and outcomes of social isolation, as well as primary deficits of current interventions targeting this population.

2.1 Understanding Social Isolation

Social isolation refers to a lack of social connections, while loneliness is the subjective feeling of being alone (Freedman & Nicolle, 2020). Both are associated with increased risks of heart disease, depression, anxiety, and cognitive decline (CDC, 2021).

2.2 Factors Contributing to Social Isolation

- **Transportation Barriers:** Limited mobility due to inadequate public transportation and chronic illnesses restrict elderly individuals from participating in social activities.
- **Chronic Illnesses:** Physical and cognitive impairments limit engagement in social events and physical mobility.
- **Language and Cultural Barriers:** Limited English proficiency and cultural stigmas surrounding mental health prevent access to healthcare and community programs (Jang et al., 2021).

2.3 Consequences of COVID-19

The pandemic intensified isolation and fear among elderly Asian Americans, with hate crimes further discouraging public participation (Jeung et al., 2022). Social distancing measures and heightened fear of violence created additional barriers to social interaction. These factors collectively exacerbated mental health issues and underscored the need for culturally safe approaches (Lim et al., 2023).

2.4 Existing Interventions

1. **Senior Centers:** Activities such as tai chi and knitting are promoted to enhance physical and mental well-being. However, language barriers often limit Asian American seniors' active participation (California Healthline, 2002).
2. **Digital Platforms:** Apps such as Facebook, Lumosity, and Televëda provide virtual activities, but they fail to address cultural or linguistic barriers effectively. Facebook often exposes seniors to misinformation, while Lumosity lacks meaningful social interaction features (Brashier & Schacter, 2020; Televeda, n.d.).

2.5 Gaps in Existing Solutions

Despite the availability of senior centers and digital platforms, there are insufficient culturally competent resources tailored to Asian American seniors. Current programs do not adapt to linguistic, cultural, and mental health needs, leading to underutilization by this demographic (Huff, n.d.-a; Lai et al., 2020). Studies emphasize the effectiveness of culturally relevant strategies, including peer support and tailored digital applications, in reducing loneliness and improving well-being.

Many interactions require in-person communications, and with current challenges regarding in-person contact, virtual platforms present themselves as a potential solution. Research supports that technology can effectively combat loneliness by enabling participants to form meaningful connections through interactive games and virtual classes (Stillers, 2020; Iacovides & Mekler, 2019). However, these platforms must incorporate cultural and emotional considerations of target groups into their system designs (Depping & Mandryk, 2017).

The data provided different dimensions of social isolation among Asian American elders, including transportation issues, health

concerns, language barriers, and the effects of the COVID-19 pandemic. Current interventions only partially address these complex needs. This evidence supports the necessity for easily accessible, culturally relevant virtual social platforms such as the proposed *Bloom* application, which incorporates features designed to support social interaction, cognitive engagement, and cultural sensitivity.

3.0 Methodology

3.1 Research Design
This research seeks to address social isolation among the Asian American geriatric population and employs both quantitative and qualitative research data collection methods. The primary goal was to develop and assess the culturally appropriate *Bloom* application, focusing on pre-survey data collection, app development, pilot testing, and effectiveness evaluation.

3.2 Pre-Survey
A pre-survey was conducted to identify the needs, preferences, and constraints of the target group of Chinese-speaking seniors in Los Angeles. The survey was conducted in both traditional and simplified Chinese, with respondents aged 60 and above. The survey included 37 participants and gathered information about their daily routines, social interaction habits, and technical proficiency.

Key Survey Questions:
- How often do you leave your house?
- What transportation options do you use?
- Are you familiar with senior center activities?
- Do you live alone or with family members?
- How confident are you in using mobile applications?

Findings:
- Respondents identified tai chi and knitting as their most preferred leisure activities.
- Afternoon classes (1:00 PM–3:00 PM and 4:00 PM–6:00 PM) were the preferred time slots for activities.
- Voice communication was favored in virtual games and chatrooms.
- Safety concerns, stemming from recent anti-Asian hate incidents, limited their willingness to engage in outdoor activities (Jeung et al., 2022; Quach et al., 2021).

3.3 App Development Process
The *Bloom* app was designed based on pre-survey findings and integrates five core features aimed at reducing social isolation:

- **Mood Tracker:** Tracks mood daily and notifies loved ones if prolonged negative feelings are detected.
- **Recreational Classes:** Online classes in tai chi and knitting (led by Madhatter Knits founder Allison Greulich). These classes are culturally and linguistically tailored (Chiu, 2021).
- **Interactive Games:** Brain-challenging activities like mahjong, Chinese chess, karaoke, and bingo foster cognitive engagement and social interaction (Mandryk et al., 2020).
- **Virtual Chatroom:** Facilitates both group discussions and one-on-one conversations, moderated to ensure a friendly and safe environment (Depping & Mandryk, 2017).

- **Location Tracker:** Ensures seniors' safety while maintaining autonomy and facilitates caregiver communication.

These features were built with a focus on usability, cultural relevance, and senior accessibility.

3.4 Pilot Study
To evaluate the app's functionality and effectiveness, a three-month pilot study was conducted with ten seniors from the Tzu Chi Foundation, all aged 65 and older.

Objectives:
- Evaluate the usability and efficiency of the app interface.
- Assess social connectivity and emotional well-being improvements.
- Collect user feedback for future app improvements.

Data Collection Metrics:
- **User Retention:** Frequency of app downloads and sustained use.
- **Feature Engagement:** Participation rates in games, classes, and chatrooms.
- **Cognitive and Emotional Well-being:** Mood improvements tracked via the app's mood tracker.
- **User Feedback:** Satisfaction surveys and qualitative feedback on app performance.

3.5 Evaluation Framework
- **Social Connectivity:** Measured through frequency and depth of participation in virtual classes and chatrooms.
- **Cognitive Stimulation:** Assessed using performance improvements in brain-training games.
- **User Retention and Satisfaction:** Measured via feedback forms and participation statistics.
- **Safety and Privacy:** Ensured through encryption protocols and user education.

3.6 Ethical Considerations
- Informed consent was obtained from all participants.
- Data anonymity and confidentiality were strictly maintained.
- Participants received clear communication about the study's objectives and their rights.

3.7 Limitations and Adjustments
The initial survey sample primarily focused on seniors from a specific network, which may limit the generalization of findings. Future studies should broaden participation to include seniors from other regions, such as Monterey Park and Arcadia. Collaboration with established platforms, such as Televëda, could also address scalability and cultural adaptation challenges.

4.0 Results

The sources of information for this study included pre-survey data, feedback obtained from the *Bloom* app trial, and interaction data. These results help to explain how the loss of social contact can be

minimized, cognitive function can be enhanced, and mental health issues can be managed among Asian American seniors through the use of the app, while also pointing out recommended areas for modifications made to the app.

4.1 Engagement Metrics

Usage Patterns:

The pilot study findings revealed notable values and frequent engagement across all components of the app. Among the video inputs, games such as mahjong and karaoke received particularly high Viewer Engagement Index scores, reflecting the cultural preferences identified in the pre-survey. The culturally relevant game mahjong, in particular, encouraged engagement and positively impacted emotional well-being. These findings align with prior research indicating that culturally tailored games effectively foster social interaction and alleviate loneliness (Iacovides & Mekler, 2019; Marston & Kowert, 2020).

Similarly, activities such as tai chi and knitting demonstrated high levels of participation, consistent with survey results in which 70% of respondents expressed a preference for these classes. Tai chi stood out for its dual benefits to physical and mental health, including stress reduction and improved mobility. These outcomes are supported by existing studies that highlight how culturally familiar physical activities enhance social connectedness and overall well-being (Chiu, 2021; Fratiglioni et al., 2004).

Audio and Video Features:

Participants frequently utilized audio and video features to communicate during group activities, chatroom discussions, and recreational classes. These features effectively mimicked face-to-face interactions, which are critical in reducing feelings of isolation. Previous research supports the assertion that virtual communication tools, particularly video and audio calls, are highly effective in creating meaningful social connections (Heins et al., 2021).

4.2 Social Connectivity

Chatroom Usage:

The virtual chatroom was one of the most utilized features, contributing significantly to social bonding. Participants engaged in group discussions and one-on-one conversations, fostering a sense of connection. Moderators maintained a friendly and welcoming atmosphere, ensuring inclusivity, especially for participants hesitant to engage due to fear stemming from anti-Asian hate crimes (Jeung et al., 2022; Quach et al., 2021).

Primary and Secondary Communication:

Interactions in the chatroom reflected both group-oriented and individual communication patterns. Group discussions encouraged community building, while private messaging offered a safe space for personal conversations. These interactions align with existing research showing that moderated virtual interactions significantly enhance trust and emotional well-being in marginalized groups (Lai et al., 2020; Lim et al., 2023).

Message Board Engagement:

The app's message boards were interactive, with seniors frequently posting and responding to messages. Individual messaging allowed for deeper personal connections, particularly among those who were initially uncomfortable with group discussions.

4.3 Emotional Well-Being

Mood Tracker Effectiveness:

The mood tracker was one of the app's standout features. Seniors were encouraged to record their daily moods, which helped identify patterns of prolonged sadness or stress. Caregivers and loved ones could also monitor these trends and intervene when necessary. Participants reported feeling more emotionally supported and connected, consistent with studies highlighting the benefits of emotional monitoring tools in enhancing mental well-being (Freedman & Nicolle, 2020).

Reduced Loneliness:

At the end of the pilot study, participants expressed lower levels of loneliness and isolation. While some primarily used the app for individual tasks, group activities like virtual classes, chatroom discussions, and interactive games played a substantial role in creating a sense of community. Prior studies confirm that consistent virtual interaction can reduce loneliness and symptoms of depression (CDC, 2021; Deng et al., 2023).

4.4 Cognitive Stimulation

Game Features:

The interactive games, including Sudoku and memory puzzles, were well-received and demonstrated measurable improvements in cognitive function. Participants showed increased accuracy and faster completion times as they continued to play. Previous studies on brain-training apps, such as Lumosity, support these findings, showing that cognitive tasks enhance memory, focus, and problem-solving skills (Zelinski & Reyes, 2009; Fratiglioni et al., 2004).

Cultural Practices:

Mahjong and Chinese chess were particularly popular among participants. These games were culturally significant and promoted both cognitive engagement and emotional satisfaction. Research underscores the importance of culturally competent cognitive interventions in improving mental stimulation and cognitive health in diverse populations (Lai et al., 2020; Marston & Kowert, 2020).

4.5 User Satisfaction and Feedback

Ease of Use:

Participants appreciated the app's user-friendly design and bilingual interface. Many seniors reported feeling confident in navigating the app's features after initial onboarding. This aligns with observations from previous studies, showing that culturally and linguistically relevant designs significantly improve adoption and usability (Jang et al., 2021).

Safety Features:

The location tracker was well accepted for balancing user independence and caregiver support. Seniors and their families expressed increased confidence in their safety while using the app. Studies on digital tracking tools for seniors affirm these findings, highlighting their dual benefits of autonomy and safety (Ausbel, 2020).

Suggestions for Improvement:

Feedback from users included requests for additional languages, more cultural content, and intergenerational activities. Suggestions included storytelling sessions for children, Asian music classes, and collaborative family activities to enhance engagement further (Budiman & Ruiz, 2021).

4.6 Retention and Incentives

Badge System:
The badge reward system effectively motivated users to participate consistently in games, chatrooms, and classes. Seniors reported a sense of accomplishment upon receiving virtual rewards. Research supports that gamification strategies improve engagement and foster long-term participation in digital platforms (Depping & Mandryk, 2017; Molero et al., 2019).

Gift Card Rewards:
Gift card incentives further encouraged regular app usage. Users indicated that tangible rewards, when paired with meaningful virtual interactions, increased their loyalty to the platform. Previous studies highlight the effectiveness of combining extrinsic rewards with intrinsic motivations like community engagement (Chiu, 2021).

Overall Assessment:
The *Bloom* app successfully addressed emotional, cognitive, and social aspects of senior well-being. Its culturally tailored features provided meaningful engagement opportunities, reducing social isolation and promoting mental health. While areas for improvement remain, such as scalability and multilingual support, the pilot results suggest that *Bloom* is both effective and adaptable.

5.0 Discussion

This paper underscores the significant issue of social isolation among elderly Asian Americans, a problem exacerbated by the COVID-19 pandemic and rooted in cultural, linguistic, and systemic barriers. The *Bloom* app presents a targeted solution to address these challenges using culturally sensitive and technology-based approaches. This section discusses the strengths, limitations, and broader implications of the findings.

5.1 Strengths of the Bloom App

1. **Cultural Sensitivity and Diversity:**
    One of the most notable strengths of the *Bloom* app is its cultural sensitivity and focus on diversity. Unlike general digital platforms such as Lumosity or Televëda, *Bloom* specifically incorporates activities and features aligned with Asian American cultural practices, such as tai chi, knitting, mahjong, and karaoke (Auxier & Anderson, 2022; Lumosity, n.d.; Televeda, n.d.). These features align with pre-survey results, where participants expressed a strong preference for these activities. Cultural relevance is crucial for fostering a sense of belonging and active participation in social programs (Jeung et al., 2022; Lai et al., 2020).

2. **Technology as a Medium for Social Support:**
    The *Bloom* app successfully replicates the interactive and social aspects of senior centers through virtual classes, moderated chatrooms, and group activities. This creates a space for social bonding and cognitive engagement. Research supports the efficacy of such virtual interventions in promoting both social and mental well-being (Kahoot, n.d.; Auora, n.d.; Iacovides & Mekler, 2019). Games like mahjong and Chinese chess, when delivered in culturally familiar contexts, have shown positive effects on loneliness and social inclusion (Zelinski & Reyes, 2009).

3. **Ease of Use:**
    The app's design focuses on simplicity and accessibility, with a bilingual interface that supports both English and Chinese. This ensures that seniors, even those with limited technological proficiency, can navigate the platform confidently. Features like the mood tracker and emergency notifications also enhance the app's practicality, aligning with findings that accessibility and usability significantly influence adoption rates (Batalova & Zong, 2015; Freedman & Nicolle, 2020).

4. **Cognitive and Emotional Benefits:**
    Cognitive stimulation is integrated through culturally familiar games, puzzles, and educational activities. These tasks are proven to reduce the risk of dementia and improve mental agility (Fratiglioni et al., 2004; Marston & Kowert, 2020). Emotional benefits are supported by features such as the mood tracker and virtual chatrooms, which help users feel emotionally connected and supported.

5.2 Challenges and Limitations

1. **Outreach and Representation:**
    While the pre-survey and pilot study provided valuable insights, the sample was limited to participants from specific networks, such as the Tzu Chi Foundation. This introduces a potential bias in the results, limiting the generalization of findings. Future studies should expand outreach to include participants from senior centers and community hubs in areas like Monterey Park and Arcadia, where a high concentration of Asian American seniors reside (Quach et al., 2021; Penn Asian Senior Services, 2021).

2. **Transaction Costs:**
    Developing and maintaining an app with extensive features, such as *Bloom*, requires significant financial investment. Scaling the app while retaining its core cultural and linguistic focus may prove challenging. Partnerships with existing platforms, such as Televëda, could reduce costs while maintaining cultural relevance (Televeda, n.d.).

3. **User Retention:**
    While incentives like badges and gift cards effectively motivated participation during the pilot study, long-term retention strategies require continuous refinement. Research shows that retention in senior-focused digital platforms depends heavily on perceived usefulness and ongoing engagement opportunities (Brashier & Schacter, 2020; Davis, 2021).

4. **Lingering Pandemic Fear and Trauma:**
    The residual effects of anti-Asian hate crimes during the pandemic continue to impact seniors' willingness to engage in social activities, both in-person and online. This highlights the importance of fostering a sense of security within virtual spaces and designing activities that build trust and emotional resilience (Jeung et al., 2022; Lim et al., 2023).

5.3 Broader Implications

1. **Coping with Mental Health Stigma:**
   The findings emphasize the need to address mental health stigma in the Asian American senior community. Culturally sensitive digital interventions, such as *Bloom*, are uniquely positioned to reduce stigma by normalizing conversations around mental health. This aligns with broader public health objectives aimed at improving mental health literacy and reducing cultural barriers to care (Mushtaq et al., 2014).

2. **Cultural Tailoring of Technology:**
   Bloom serves as a successful model for how technology can address cultural barriers in senior care. By incorporating activities and tools that resonate with cultural values, the app creates a sense of familiarity and comfort for its users. This framework can be replicated for other minority communities to address their unique social and mental health needs (Chiu, 2021; National Academies Press, 2020).

3. **Intergenerational Engagement:**
   Future versions of the app could integrate features that promote intergenerational activities, such as virtual storytelling sessions or collaborative family games. These activities could reduce intergenerational trauma and strengthen family ties (Isobel et al., 2021).

4. **Policy Integration:**
   Findings from this study support the integration of culturally tailored digital interventions into senior care policies. Government health agencies and community organizations should prioritize funding for programs that address cultural, linguistic, and emotional barriers among seniors (Salant & Lauderdale, 2003; Batalova & Zong, 2015).

5.4 Future Research Directions

1. **Scaling and Expansion:**
   Future research should explore how the *Bloom* app can be scaled to serve diverse cultural groups while retaining its cultural specificity for Asian American seniors. Multilingual support and expanded cultural offerings will be critical to success (Budiman & Ruiz, 2021).

2. **Intergenerational Features:**
   Adding features that facilitate communication and activities between seniors and younger family members could significantly enhance user engagement and emotional well-being.

3. **Longitudinal Studies:**
   Long-term studies should assess the app's effectiveness over extended periods. Data on sustained user engagement, long-term mental health outcomes, and evolving social patterns will provide valuable insights (Deng et al., 2023).

5.5 Summary of Discussion

The *Bloom* app represents a culturally tailored digital intervention addressing the multifaceted issue of social isolation among elderly Asian Americans. Its strengths lie in cultural relevance, usability, emotional and cognitive benefits, and technological accessibility. However, limitations such as outreach challenges, retention issues, and financial constraints highlight areas for improvement.

The findings have significant implications for policy, healthcare systems, and future technological solutions designed for marginalized senior populations. Moving forward, expanding the app's reach, fostering intergenerational engagement, and conducting longitudinal evaluations will be critical in realizing its full potential.

6.0 Conclusion

The findings of this study emphasize the critical need to address social isolation among elderly Asian Americans, a problem exacerbated by the COVID-19 pandemic and rooted in cultural, linguistic, and systemic barriers. Social isolation has significant consequences on mental health, physical well-being, and overall quality of life, making it a pressing public health concern. The *Bloom* app emerges as an innovative and culturally tailored digital intervention designed to tackle these challenges directly.

The app addresses core aspects of senior well-being, including emotional health, cognitive engagement, and social connectivity, through features such as the mood tracker, culturally relevant recreational activities, interactive games, moderated virtual chatrooms, and a location tracker. These components collectively foster a sense of community, reduce loneliness, and empower seniors to maintain meaningful connections despite physical and social barriers.

6.1 Key Findings

1. **Cultural Relevance:**
   The *Bloom* app successfully bridges cultural gaps by integrating activities and games that reflect the cultural preferences of elderly Asian Americans, such as tai chi, knitting, karaoke, and mahjong. These culturally familiar activities encourage higher levels of engagement and foster emotional well-being (Chiu, 2021; Jang et al., 2021; Lai et al., 2020).

2. **Technological Accessibility:**
   The app's user-friendly design and bilingual interface significantly improve accessibility for seniors, many of whom face technological and language barriers. Video and audio communication tools effectively replicate face-to-face interactions, further enhancing user engagement (Heins et al., 2021; Quach et al., 2021).

3. **Cognitive Health:**
   Interactive games and educational activities within the app demonstrated measurable improvements in cognitive function. Features such as Sudoku and memory puzzles enhanced focus, problem-solving skills, and mental agility (Zelinski & Reyes, 2009; Fratiglioni et al., 2004).

4. **Emotional Well-Being:**
   Tools like the mood tracker and virtual chatrooms played a significant role in improving emotional health. Seniors reported feeling more supported, connected, and less lonely, aligning with previous findings on the emotional benefits of digital interventions (Freedman & Nicolle, 2020).

5. **User Retention and Engagement:**
   The integration of gamification features, including badges and gift card incentives, proved effective in maintaining user engagement. These reward systems motivated seniors to participate consistently in games, virtual classes, and chatrooms (Depping & Mandryk, 2017; Molero et al., 2019).

6.2 Policy and Practical Implications

1. **Integration into Public Health Frameworks:**

Policymakers and healthcare agencies should consider integrating culturally tailored digital interventions, like *Bloom*, into senior care policies. These platforms can complement traditional in-person services and expand outreach to underserved populations (Salant & Lauderdale, 2003; Batalova & Zong, 2015).

2. **Funding for Culturally Relevant Interventions:**
   Government and private funding should prioritize developing and scaling culturally sensitive technologies aimed at addressing social isolation and mental health challenges among seniors.

3. **Intergenerational Communication:**
   Future iterations of the app should explore features designed to foster stronger intergenerational connections, bridging communication gaps between seniors and younger family members (Isobel et al., 2021).

4. **Scalable Digital Solutions:**
   The success of *Bloom* offers a replicable framework for designing culturally sensitive interventions for other minority senior populations. Collaborative efforts with existing platforms, such as Televëda, could streamline scalability while retaining cultural specificity (Televeda, n.d.).

6.3 Future Directions

1. **Scaling and Expansion:**
   The app should be expanded to cater to other cultural and linguistic groups while retaining the cultural specificity that makes it effective. Multilingual support and additional culturally familiar activities should be prioritized (Budiman & Ruiz, 2021).

2. **Intergenerational Features:**
   Features facilitating family involvement and intergenerational activities, such as collaborative games, storytelling sessions, and virtual family meetups, should be explored.

3. **Longitudinal Research:**
   Future research should focus on long-term studies to evaluate the sustained impact of *Bloom* on social isolation, mental health, and cognitive function among elderly Asian Americans. Such studies would provide valuable insights into long-term engagement trends and user retention strategies (Deng et al., 2023).

6.4 Final Remarks

The *Bloom* app represents a significant advancement in addressing the complex issue of social isolation among elderly Asian Americans. By combining cultural sensitivity, technological accessibility, and evidence-based design, the app successfully fosters social connections, enhances emotional well-being, and promotes cognitive health.

While challenges such as scalability, outreach limitations, and long-term retention remain, the app serves as a scalable model for future interventions targeting similar issues in other minority communities. Policymakers, healthcare professionals, and technology developers must collaborate to build on the findings of this study, ensuring that digital innovations like *Bloom* continue to evolve and address the needs of diverse aging populations.

In conclusion, the *Bloom* app is not just a digital tool—it is a lifeline for many seniors who face isolation and loneliness. By respecting cultural identities, promoting social inclusion, and enhancing emotional and cognitive well-being, *Bloom* sets a precedent for future technology-driven solutions aimed at empowering marginalized senior communities.

Declarations

Authors' contributions

Not Applicable

Competing Interests

Author declares there is no competing interests.

Ethical approval

Not applicable.

Consent to participate

Not applicable.

Availability of data and materials

Available on corresponding author upon responsible request.

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