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REVIEW

Cultural Determinants of Assistive Health Technology Acceptance in Asian Older Adults in Low- and Middle-Income Countries: A Mixed-Methods Systematic Review with Evidence Predominantly from East Asia

Dhika Dharmansyah[1,2], Laili Rahayuwati[3], Iqbal Pramukti[3], Kuswandewi Mutyara[4]

[1]Doctoral Program in Medicine, Faculty of Medicine, Universitas Padjadjaran, Sumedang, West Java, Indonesia; [2]Department of Nursing, Faculty of Sport and Health Education, Universitas Pendidikan Indonesia, Bandung, Indonesia; [3]Department of Community Health Nursing, Faculty of Nursing, Universitas Padjadjaran, Sumedang, West Java, Indonesia; [4]Department of Public Health, Faculty of Medicine, Universitas Padjadjaran, Sumedang, West Java, Indonesia

Correspondence: Laili Rahayuwati, Department of Community Health Nursing, Faculty of Nursing, Universitas Padjadjaran, Sumedang, West Java, Indonesia, Email laili.rahayuwati@unpad.ac.id

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Purpose: This mixed-methods systematic review synthesizes evidence on how cultural determinants influence acceptance of assistive health technologies (AHTs) among older adults aged 60 years and over in Asian low- and middle-income countries (LMICs). Despite increasing availability of digital health technologies, adoption rates among elderly populations in these settings remain critically low, and the dominant technology acceptance frameworks, developed in Western contexts, may inadequately account for cultural dimensions prevalent in Asian societies.

Methods: Following a protocol pre-registered on the Open Science Framework (DOI: 10.17605/OSF.IO/8E9CD), systematic searches were conducted across PubMed, Scopus, IEEE Xplore, and Web of Science. From 488 records identified, 20 underwent full-text screening against five eligibility criteria. The most critical criterion required that cultural factors be explicitly investigated as a variable or theme. Six studies met all criteria. Quality assessment used design-matched tools: the JBI Critical Appraisal Checklist for Qualitative Research (10 items), the JBI Checklist for Analytical Cross-Sectional Studies (8 items), and the Mixed Methods Appraisal Tool (MMAT, 5 items). Synthesis followed a convergent integrated approach per JBI methodology.

Results: Six studies (3 qualitative, 2 quantitative, 1 mixed-methods) from China (n=4), India (n=1), and Thailand (n=1) were included. Five overarching cultural themes emerged: (1) family and filial piety as a double-edged enabler; (2) stigma and face culture (mianzi); (3) collectivist social norms; (4) trust and traditional health beliefs; and (5) digital literacy as a culturally mediated gap. Methodological quality was good: qualitative studies scored 8/10 to 10/10, the cross-sectional studies scored 6/8 and 8/8, and the mixed-methods study scored 5/5.

Conclusion: Cultural determinants exert pervasive influence on AHT acceptance. Current acceptance frameworks require cultural adaptation. The evidence is geographically concentrated in East Asia, predominantly China, indicating an urgent need for studies from Southeast and South Asian LMICs.

Keywords: cultural determinants, assistive health technology, older adults, technology acceptance, Asian LMIC, filial piety, mixed-methods systematic review

Introduction

The older adult population in Asian low- and middle-income countries (LMICs) is growing at an unprecedented rate. By 2050, the number of people aged 60 years and over in Asia is projected to exceed 937 million, with Southeast Asia alone

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expected to see its elderly population rise from 77.4 million in 2020 to 173.3 million.[1,2] This demographic shift creates an urgent need for assistive health technologies (AHTs), including wearable health monitors, telehealth platforms, mobile health (mHealth) applications, assistive devices, and smart home health monitoring systems, to support functional independence and quality of life among aging populations.[3]

Despite the increasing availability of these technologies, adoption rates among older adults in Asian LMICs remain critically low. The World Health Organization reports that as few as 3% of individuals in some low-income countries have access to the assistive products they need, and unmet demand in LMICs is estimated to be ten times larger than the current supply.[4] While technological, economic, and infrastructural barriers have been widely studied, a growing body of evidence suggests that cultural factors, including collectivism, family dynamics, stigma towards aging, and social hierarchies, significantly influence health technology acceptance.[5,6]

The dominant theoretical frameworks for studying technology acceptance, namely the Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT), were developed primarily within Western, industrialized contexts.[7] These frameworks may inadequately account for cultural dimensions prevalent in Asian societies. UTAUT in particular has been criticized for its limited capacity to capture culturally specific moderators when applied across national contexts, and extensions incorporating trust, risk, and culturally rooted normative pressure have been proposed to improve its explanatory power.[8] Hofstede's cultural dimensions, including collectivism, power distance, and long-term orientation, have likewise been used to interpret cross-national variation in older adults' technology uptake, suggesting that constructs such as filial piety, face culture (mianzi), and collectivist decision-making are inadequately represented in standard Social Influence measures.[9]

No existing systematic review has comprehensively synthesized evidence on how culture-specific determinants in Asian LMICs shape older adults' acceptance of AHTs. To verify this gap, the PROSPERO register and adjacent reviews of gerontechnology acceptance in East Asian contexts were screened prior to protocol registration. This review addresses that gap by conducting a mixed-methods synthesis integrating quantitative data (determinants and effect sizes) with qualitative data (lived experiences and cultural perceptions) to generate a holistic understanding of the phenomenon. The primary research questions, structured using the PICo (Population, Interest, Context) framework, are: (1) What are the cultural determinants that influence acceptance of assistive health technologies among older adults aged ≥60 years in Asian LMICs? (2) How do these cultural factors interact with individual, technological, and contextual variables to shape acceptance or rejection of AHTs?

Methods

Protocol and Registration

This mixed-methods systematic review was conducted in accordance with the Joanna Briggs Institute (JBI) methodology for mixed-methods systematic reviews and reported following the PRISMA 2020 Statement[10] and the ENTREQ framework for the qualitative component. The protocol was pre-registered on the Open Science Framework using the Generalized Systematic Review Registration Form (GSRRF v1.00; DOI: 10.17605/OSF.IO/8E9CD).[11]

Search Strategy

Systematic searches were conducted across four electronic databases: PubMed/MEDLINE, Scopus, IEEE Xplore, and Web of Science Core Collection. The search query combined terms across five concept blocks: (1) population — ("older adult*" OR "elderly" OR "aged" OR "aging" OR "geriatric" OR "senior citizen*"); (2) technology — ("assistive technolog*" OR "health technolog*" OR "mHealth" OR "eHealth" OR "telehealth" OR "telemedicine" OR "wearable" OR "smart home" OR "remote monitoring"); (3) acceptance — ("acceptance" OR "acceptability" OR "adoption" OR "intention to use" OR "TAM" OR "UTAUT"); (4) culture — ("cultur*" OR "belief*" OR "value*" OR "norm*" OR "tradition*" OR "collectivis*" OR "famili*" OR "stigma"); and (5) context — ("Asia" OR "low-income" OR "middle-income" OR "LMIC" OR "developing countr*" OR specific country names). The search was restricted to English-language publications from January 2014 to March 2026.

Eligibility Criteria

Inclusion and exclusion criteria were established using the PICo framework adapted for mixed-methods reviews. Inclusion criteria comprised: (a) older adults aged ≥60 years or studies explicitly identifying participants as "older adults" or "elderly"; (b) investigation of acceptance, adoption, or intention to use AHT with at least one cultural factor examined as a determinant, barrier, or facilitator; (c) conducted in an Asian LMIC as classified by the World Bank; (d) quantitative, qualitative, or mixed-methods empirical design; (e) published in English from January 2014 onward. Eligible AHTs comprised digital and assistive devices that support functional independence, health monitoring, or care delivery for older adults, including mobile health (mHealth) applications, telehealth and telemedicine platforms, wearable health monitors, smart home health systems, and physical assistive devices such as wheelchairs. Eligible study designs comprised cross-sectional surveys, structural equation modelling studies, ethnographies, case studies, focus group studies, and mixed-methods designs. Cultural constructs were operationalized broadly to include explicitly named cultural values (eg., filial piety, collectivism, mianzi), beliefs (eg., traditional health beliefs, stigma), norms (eg., gender roles, intergenerational obligation), and practices (eg., family-mediated decision-making), provided they were investigated as a variable, theme, or analytic construct rather than mentioned only as background. Exclusion criteria included: studies in high-income countries (E2), studies not examining cultural factors as a variable (E5), non-elderly populations without separable data (E1), conference abstracts, editorials, and systematic reviews (E6).

Screening

Screening was conducted in three stages. First, deduplication was performed using Zotero, removing 5 duplicate records from 488 identified. Second, title and abstract screening of 483 records was conducted independently by two reviewers in Rayyan with blinding activated, yielding 20 articles for full-text assessment. Third, full-text screening evaluated each article against all five eligibility criteria. The most critical filter, E5 (explicit examination of cultural factors as a variable or theme, not merely mentioned in background or discussion), was applied rigorously. Discrepancies at both title/abstract and full-text stages were resolved through consensus discussion between the two reviewers, with a third reviewer available for unresolved disagreements; in practice, no third-reviewer adjudication was required. A formal interrater reliability statistic (eg., Cohen's kappa) was not pre-computed, which is acknowledged as a methodological limitation. Exclusion reasons were recorded using standardized codes (E1–E9) as specified in the protocol.[11]

Data Extraction

Data were extracted in two stages. Pilot extraction was conducted on five purposively selected studies representing diverse designs to test and refine the extraction form. Full extraction covered: metadata (authors, year, country, DOI), study characteristics (design, framework, sample size), population characteristics (age range, gender, setting), technology characteristics (type, function), cultural determinants (specific variables, measurement), outcomes (acceptance measures, key findings), and quality indicators. Extraction was performed independently by two reviewers using a standardized Microsoft Excel form.

Quality Assessment

Methodological quality was appraised using design-appropriate tools: the JBI Critical Appraisal Checklist for Qualitative Research (10 items) for qualitative studies, the JBI Critical Appraisal Checklist for Analytical Cross-Sectional Studies (8 items) for cross-sectional quantitative studies, and the Mixed Methods Appraisal Tool (MMAT version 2018) for mixed-methods studies.[12,13] Because these instruments use non-comparable scoring scales, results are reported by instrument rather than as a unified range. Two independent reviewers conducted appraisal. Studies were not excluded based on quality scores; however, quality informed the interpretation of findings.

Synthesis

Synthesis followed a convergent integrated approach in accordance with JBI methodology for mixed-methods systematic reviews.[14] Quantitative data were transformed into narrative textual descriptions (qualitized), preserving reported effect

sizes, path coefficients, and model fit indices within each thematic narrative so that the magnitude and direction of quantitative associations remain interpretable alongside qualitative findings. Qualitative data were retained in thematic form. Integrated data were then coded inductively to identify descriptive themes, which were organized into analytical themes. Findings were synthesized within a matrix organizing cultural determinants by type (values, beliefs, norms, practices), level of influence (individual, family, community, societal), and direction of influence (facilitator versus barrier). Meta-analysis was not undertaken because of the heterogeneity of designs, technologies, cultural constructs, and outcome measures across the included studies and the small number of comparable quantitative effect estimates; this is acknowledged as a limitation of the synthesis.

Results

Study Selection

A total of 488 records were identified across four databases: PubMed (n=121), Scopus (n=63), IEEE Xplore (n=180), and Web of Science (n=124). After removing 5 duplicates, 483 records were screened at the title and abstract level, of which 463 were excluded. Twenty full-text articles were assessed for eligibility. Of these, 14 were excluded: 11 for lacking explicit cultural factors as variables (E5), 1 for unclear country context combined with no cultural factor (E2/E5), 1 for including a high-income country with participants aged <60 years and no cultural factor (E2/E1/E5), and 1 for lack of cultural factor combined with an age threshold starting at 50 years (E5/E1). Six studies met all inclusion criteria and were included in the synthesis. The PRISMA flow diagram is presented in Figure 1.

Characteristics of Included Studies

The six included studies were published between 2021 and 2026, conducted in China (n=4),[15–18] India (n=1),[19] and Thailand (n=1).[20] Three employed qualitative designs (focused ethnography, case study, focus groups),[15,17,18] two used quantitative cross-sectional designs (PLS-SEM and SEM),[16,20] and one was a mixed-methods study.[19] Technologies examined included digital health/smart home systems, mHealth applications, wheelchairs (assistive devices), telehealth platforms, AI-enabled wearable medical devices, and smart home products. Sample sizes ranged from 12 to 355 participants. All studies focused on older adults aged ≥60 years. The characteristics of included studies are summarized in Table 1.

Quality Assessment

All six studies demonstrated adequate methodological quality. Among the three qualitative studies assessed using the JBI Checklist for Qualitative Research (maximum 10), two scored 10/10[15,17] and one scored 8/10 (lacking a cultural positioning statement and unclear researcher reflexivity).[18] The two quantitative studies assessed using the JBI Cross-Sectional Checklist (maximum 8) scored 8/8[20] and 6/8 (with unclear confounder identification).[16] The mixed-methods study scored 5/5 on the MMAT (maximum 5).[19] Because the three instruments are scored on non-comparable scales, results should be interpreted by instrument rather than as a single unified range. Overall risk of bias was low to moderate across the included set. Quality assessment results are presented in Table 2.

Convergent Integrated Synthesis

The convergent integrated synthesis identified five overarching cultural themes influencing AHT acceptance among older adults in Asian LMICs A thematic map of these findings is presented in Figure 2. The cultural determinants identified across all five themes, including their type, level of influence, direction, and strength of evidence, are summarized in Table 3.

Theme 1: Family and Filial Piety as Double-Edged Enabler

The most pervasive cultural determinant across the included studies was the family system rooted in Confucian filial piety Intergenerational technology support, that is, adult children's willingness and ability to provide technology guidance, significantly predicted elderly smart home adoption intention in China[16] Family members served as essential cultural bridges

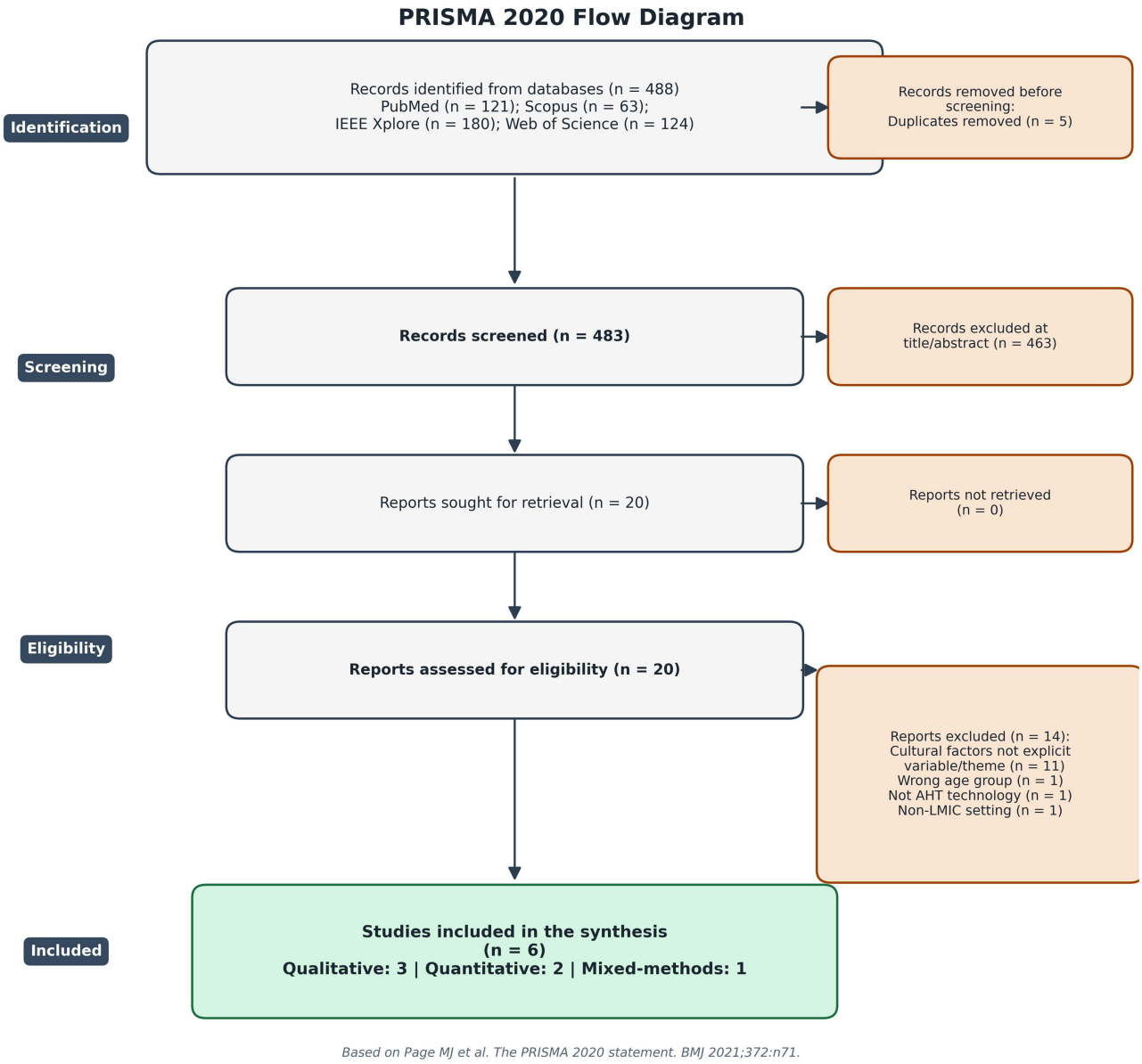

Figure 1 PRISMA 2020 flow diagram of study identification, screening, and inclusion. From 488 records identified across four databases, 5 duplicates were removed, 483 records were screened at the title/abstract level, 463 were excluded, 20 underwent full-text assessment, 14 were excluded with documented reasons, and 6 studies met all eligibility criteria and were included in the synthesis.

for telehealth access in rural India, reflecting the joint family structure[19] However, filial piety also created barriers: elderly adults internalized guilt about "burdening" children with technology assistance needs,[17] while empty-nest households in rural China left elderly individuals without the family scaffolding necessary for sustained technology use[15] This dual role, enabler when present and barrier when absent, positioned family dynamics as the most critical cultural determinant of AHT acceptance.

Theme 2: Stigma and Face Culture (Mianzi)

Stigma operated at multiple levels across the included studies In the Chinese context, wheelchairs functioned as visible stigma symbols encoding disability and dependence, deeply embedded in Confucian notions of family burden and social labeling.[17] Face culture (mianzi) created a motivation divide where elderly adults avoided using digital health technology in front of others to prevent perceived incompetence and loss of social standing. Self-deprecating beliefs, expressed as "rotten wood that cannot be carved", reflected internalized ageism reinforced by cultural expectations.[15] Thai collectivism similarly amplified gerontechnology anxiety, as public technology failure triggered culturally-mediated shame.[20]

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Table 1 Characteristics of Included Studies (n=6)

Study	Country/ Setting	Design	Framework	Sample (n)	Age	Technology	Cultural Determinants Examined	Key Findings
Zhang et al, 2026[15]	China (rural Chongqing)	Qualitative (focused ethnography)	Three-level Digital Divide + Grounded Theory	42 (24 elderly)	60-80+	Digital health/ Smart home (IoT sensors, wearables, telehealth)	Face culture (mianzi), filial piety, thrift/frugality, collectivist norms, empty-nest dynamics, stigma of incompetence	Four usage divide dimensions: skills, motivation, support, persistence Cultural factors pervade all dimensions
Zhou et al, 2024[16]	China (community)	Quantitative (SEM)	Extended TAM	236	≥60	Smart home products	Intergenerational technology support (filial piety-derived family dynamics)	Intergenerational support significantly predicts smart home adoption intention Family role mediates acceptance
Chu et al, 2025[17]	China (urban Hubei)	Qualitative (case study)	Health Stigma & Discrimination Framework	59 (15 elderly)	60-80	Wheelchair (assistive device)	Confucian filial piety, disability stigma, face culture, social labeling, collectivist family burden	Five themes: symbolic identity impact, visual aesthetics, environmental/functional adaptability, ease of operation Design reinforces or mitigates stigma
Xing et al, 2021[18]	China (national)	Qualitative (focus groups)	Thematic analysis (socio-technical)	9 focus groups (families, providers, organizations)	Ageing population	AI wearable medical devices	Socio-cultural barriers, family attitudes, trust, healthcare system culture, collaboration barriers	16 barriers identified Lack of collaboration (culturally rooted) is most critical Family attitudes, trust, and privacy as cultural barriers.
Rasekaba et al, 2022[19]	India (rural Karnataka)	Mixed-methods (survey + interviews)	eHEALS/ Digital-Health Literacy	150	≥60	Telehealth	Family support as cultural enabler, community norms, gender roles, social support networks	Very low digital/health literacy Family as cultural bridge for telehealth Gender disparities linked to cultural norms.
Chopvitayakun et al, 2025[20]	Thailand (community)	Quantitative (PLS-SEM)	UTAUT + STAM	355	≥60	mHealth (nutritional tracking)	Thai collectivist culture, gerontechnology anxiety (culturally mediated), social influence in collectivist context	Gerontechnology anxiety moderates adoption within collectivist framework Social influence is strong predictor

Abbreviations: AHT, assistive health technology; AI, artificial intelligence; eHEALS, eHealth Literacy Scale; IoT, internet of things; LMIC, low- and middle-income country; mHealth, mobile health; n, sample size; PLS-SEM, partial least squares structural equation modeling; SEM, structural equation modeling; STAM, Senior Technology Acceptance Model; TAM, Technology Acceptance Model; UTAUT, Unified Theory of Acceptance and Use of Technology.

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Table 2 Quality Assessment Results

Study	Design	Tool	Score	Risk of Bias	Key Strengths	Key Limitations
Zhang et al, 2026[15]	Qualitative	JBI-Qualitative	10/10	Low	Extensive fieldwork (186 sessions), triangulation, audit trail, member checking	Single district (Bishan); researcher as outsider
Zhou et al, 2024[16]	Cross-sectional	JBI-Cross-Sectional	6/8	Moderate	Explicit cultural variable; adequate sample (n=236)	Confounders unclear; possible urban bias
Chu et al, 2025[17]	Qualitative	JBI-Qualitative	10/10	Low	Multi-stakeholder triangulation, member checking, ethics approval	Urban only; manual wheelchair users only; snapshot design
Xing et al, 2021[18]	Qualitative	JBI-Qualitative	8/10	Low-Moderate	Socio-technical depth; multi-perspective (9 focus groups)	No cultural positioning statement; researcher reflexivity unclear
Rasekaba et al, 2022[19]	Mixed-methods	MMAT	5/5	Low-Moderate	Mixed-methods integration; rural LMIC focus; eHEALS validated	Small sample (n=150); convenience sampling; 2 sites only
Chopvitayakun et al, 2025[20]	Cross-sectional	JBI-Cross-Sectional	8/8	Low	Adequate sample (n=355); validated instruments; explicit cultural framing	Cross-sectional design; self-report bias; single country

Abbreviations: eHEALS, eHealth Literacy Scale; JBI, Joanna Briggs Institute; JBI-Cross-Sectional, JBI Critical Appraisal Checklist for Analytical Cross-Sectional Studies; JBI-Qualitative, JBI Critical Appraisal Checklist for Qualitative Research; LMIC, low- and middle-income country; MMAT, Mixed Methods Appraisal Tool; n, sample size.

Theme 3: Collectivist Social Norms and Community Influence

In collectivist Asian LMIC societies, technology adoption was not an individual decision but a socially embedded process. Thai elderly adoption was strongly driven by social influence from family and peers within a collectivist framework,[20] while Indian elderly relied on community networks, neighbors and local health workers, as cultural enablers of telehealth readiness.[19] Chinese elderly experienced both positive (neighbor modeling of technology use) and negative (social comparison causing shame) effects of collectivist norms.[15]

Theme 4: Trust, Traditional Health Beliefs, and Technology Skepticism

A pattern of technology mistrust intersected with traditional health-seeking behaviors. Chinese elderly in rural areas expressed preference for face-to-face medical encounters over telemedicine, rooted in traditional beliefs that physical co-presence is necessary for genuine healing.[15,18] Privacy fears about smart devices and false alarms eroding trust compounded this skepticism.[18] Indian elderly similarly displayed a passive health orientation, "seek medical help only when sick", creating misalignment with proactive digital health monitoring.[19]

Theme 5: Digital Literacy as a Culturally-Mediated Gap

Low digital literacy among elderly in Asian LMICs was not merely a skills deficit but a culturally-rooted phenomenon. In rural China, thrift values (jieyue) caused elderly to fear damaging expensive devices, limiting exploration and learning.[15] Gender disparities in India restricted women's technology access through cultural norms rather than economic barriers alone.[19] Dialectal barriers in rural China prevented effective interaction with standard-language technology interfaces.[15] These findings reframed digital literacy as a cultural literacy challenge requiring culturally-tailored interventions rather than generic technology training.

Discussion

The aim of this review was to synthesize evidence on how cultural determinants shape acceptance of assistive health technologies among older adults in Asian LMICs, a population for which culturally specific drivers of acceptance had not previously been integrated across study designs. By focusing on studies that explicitly investigated cultural factors as

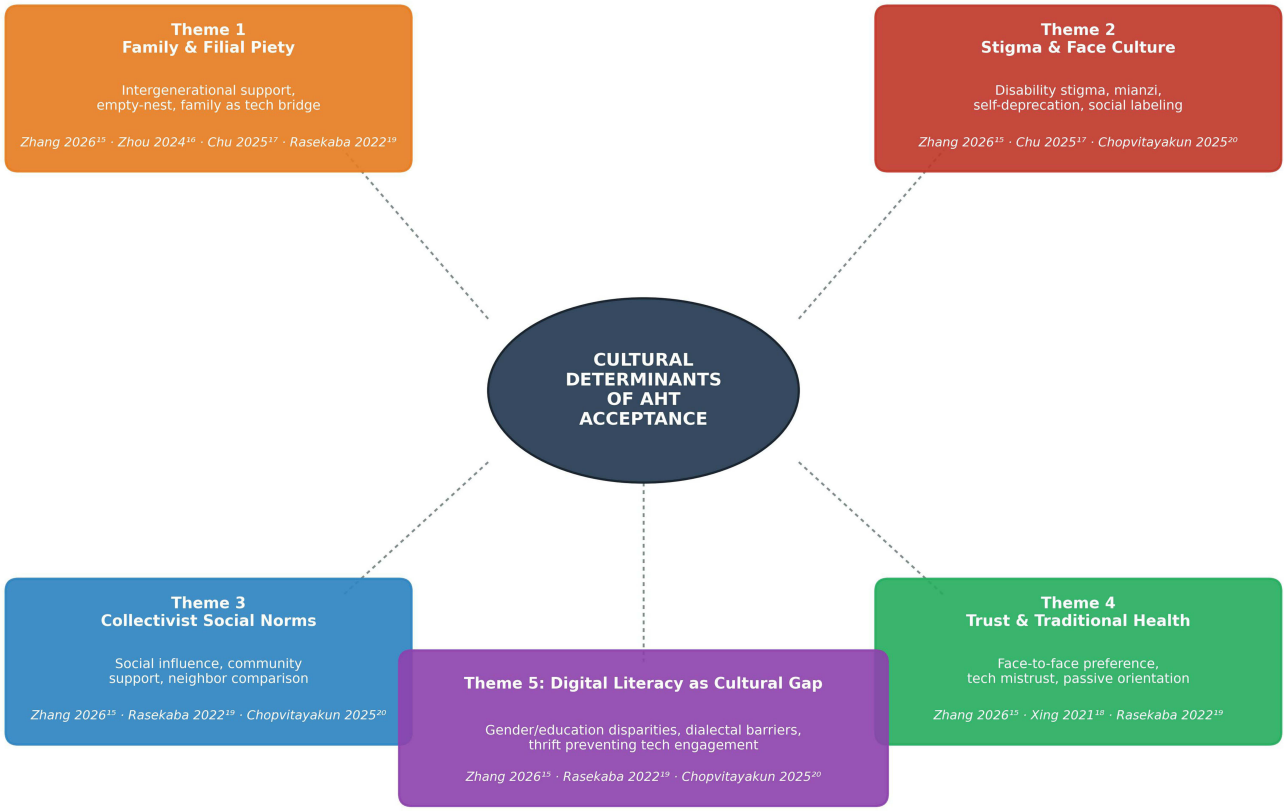

Figure 2 Convergent integrated synthesis theme map Visual summary of the five overarching cultural themes that influence assistive health technology acceptance among older adults in Asian LMICs (family and filial piety; stigma and face culture; collectivist social norms; trust and traditional health beliefs; digital literacy as a culturally-mediated gap), with their levels of influence (individual, family, community, societal) and direction (facilitator and/or barrier) The studies supporting each theme are indicated within each panel by first author and publication year followed by the corresponding superscript reference number from the reference list (Zhang et al, 2026,[15] Zhou et al, 2024,[16] Chu et al, 2025,[17] Xing et al, 2021,[18] Rasekaba et al, 2022,[19] Chopvitayakun et al, 2025).[20]

variables or themes, the review addresses a gap that earlier acceptance research, dominated by Western-derived TAM and UTAUT applications, has not systematically engaged with. Five overarching themes were identified through convergent integrated synthesis, each representing culturally-embedded mechanisms that current technology acceptance frameworks fail to adequately capture.

The finding that filial piety functions as both enabler and barrier represents a paradox that Western-derived frameworks such as TAM and UTAUT cannot accommodate within their linear facilitator-barrier dichotomies. In the UTAUT

Table 3 Convergent Integrated Synthesis Matrix: Cultural Determinants by Theme, Level, and Direction

Cultural Theme	Type	Level of Influence	Direction	Supporting Studies	Strength of Evidence
Family & Filial Piety	Values, Norms	Family, Individual	Facilitator & Barrier	Zhang et al (2026),[15] Zhou et al (2024),[16] Chu et al (2025),[17] Rasekaba et al (2022)[19]	Strong (4 studies)
Stigma & Face Culture (Mianzi)	Beliefs, Norms	Individual, Community	Barrier	Zhang et al (2026),[15] Chu et al (2025),[17] Chopvitayakun et al (2025)[20]	Strong (3 studies)
Collectivist Social Norms	Norms, Practices	Community, Societal	Facilitator & Barrier	Zhang et al (2026),[15] Rasekaba et al (2022),[19] Chopvitayakun et al (2025)[20]	Strong (3 studies)
Trust & Traditional Health Beliefs	Beliefs, Practices	Individual, Community	Barrier	Zhang et al (2026),[15] Xing et al (2021),[18] Rasekaba et al (2022)[19]	Strong (3 studies)

(*Continued*)

Table 3 (Continued).

Cultural Theme	Type	Level of Influence	Direction	Supporting Studies	Strength of Evidence
Digital Literacy as Cultural Gap	Values, Norms, Practices	Individual, Family, Community	Barrier	Zhang et al (2026),[15] Rasekaba et al (2022),[19] Chopvitayakun et al (2025)[20]	Strong (3 studies)

Notes: Citations are presented as first author et al (year) followed by the corresponding reference number from the reference list Strength of evidence classified as: Strong (≥3 studies of high-to-moderate quality), Moderate (2 studies), Emerging (1 study), per GSRRF-57 protocol criteria.

framework, Social Influence is conceptualized as a unidirectional positive predictor of behavioral intention,[7] yet the present findings demonstrate that family influence in Confucian societies operates bidirectionally, simultaneously enabling adoption through intergenerational technology support[16] and inhibiting it through guilt and burden avoidance.[15,17] This is consistent with the cultural cognition perspective advanced by Zhao et al,[5] who demonstrated that cultural values play a non-negligible role in shaping health-related technology attitudes through both direct and moderating effects.

The prominence of stigma and face culture in shaping technology avoidance behaviors extends beyond what technology anxiety scales typically measure While gerontechnology anxiety has been recognized as a barrier to adoption,[20] the present review reveals that the underlying mechanism is not simply unfamiliarity with technology but rather a culturally-specific fear of public incompetence that threatens social standing within collectivist communities.[15] This finding has important implications for intervention design: technology training programs for elderly populations in Asian LMICs should incorporate private, shame-free learning environments and peer-based rather than public demonstration approaches.

The reframing of digital literacy as a culturally-mediated gap represents a significant conceptual contribution. Standard digital literacy interventions assume that skills training alone will bridge the adoption gap. However, the present findings suggest that thrift values preventing device exploration,[15] gendered technology access norms,[19] and dialectal barriers[15] require culturally-situated solutions, including dialect-compatible interfaces, family-mediated learning, and low-cost practice devices, that address the cultural roots of digital exclusion rather than treating it as a simple skills deficit.

Taken together, these findings indicate the direction in which TAM and UTAUT need to be culturally adapted for Asian LMIC contexts. Specifically, they support: (i) disaggregating Social Influence into separable family and peer pressure components that can be modelled bidirectionally rather than as a single positive predictor; (ii) incorporating validated cultural constructs such as filial piety (eg., the Dual Filial Piety Scale by Yeh and Bedford) and face concern as moderators of Performance Expectancy and Behavioural Intention; and (iii) re-specifying technology anxiety as culturally mediated shame within collectivist settings.[9] Full development and psychometric validation of such an extended model lies beyond the scope of this synthesis and is signposted as a priority for future primary research, as outlined in the Implications for Future Research section.

It should also be noted that one included study, Zhang et al (2026, rural Chongqing),[15] contributes findings to all five themes, reflecting both the cultural richness of its focused ethnographic design and the small overall evidence base Its scope limitations, a single rural district, snapshot design, and researcher position as a cultural outsider, were considered when weighting its contribution to the synthesis, and themes that depended substantially on this study are explicitly cross-referenced to convergent or corroborating evidence from other included studies where available.

Implications for Practice and Policy

The findings have several practical implications First, AHT design should incorporate culturally-sensitive features such as dialect support, simplified interfaces that minimize the visibility of user errors, and aesthetic design that reduces assistive device stigma[17] Second, implementation strategies should leverage existing cultural structures, particularly

family networks and community health workers, as channels for technology introduction rather than relying solely on formal training programs[19] Third, policymakers in Asian LMICs, particularly in China where the bulk of available evidence originates and in countries with comparable Confucian and collectivist contexts, should move beyond access-focused strategies to address the usage divide, recognizing that technology availability does not equate to effective utilization among culturally diverse elderly populations.[15]

Limitations

This review has several limitations First, geographic concentration is a concern: four of six included studies were conducted in China, with only one each from India and Thailand No studies from Southeast Asian LMICs (Indonesia, Vietnam, Cambodia, Philippines) met all inclusion criteria, limiting the generalizability of findings across the diverse cultural landscape of Asia Second, the strict interpretation of the cultural factor criterion (E5) excluded papers that discuss cultural context descriptively but do not formally investigate it as a variable or theme. While methodologically consistent with the registered protocol, this may have introduced a form of selection bias by under-representing studies in which cultural factors operate implicitly rather than explicitly, and may have reduced the breadth of the evidence base. Third, the small number of included studies (n=6) limits the depth of subregional comparison across South, Southeast, and East Asian contexts. Fourth, the heterogeneity of technologies examined (mHealth, smart home, telehealth, wearable, assistive device) strengthens generalizability but limits technology-specific sub-analysis. Fifth, although the review protocol specified grey literature searches, only peer-reviewed studies ultimately met inclusion criteria, raising the possibility of publication bias. Sixth, screening discrepancies were resolved through consensus discussion rather than a pre-computed interrater reliability statistic such as Cohen's kappa; while consensus resolution is consistent with the registered protocol, the absence of a formal reliability coefficient is acknowledged as a methodological limitation. Seventh, the absence of meta-analytic pooling, while methodologically appropriate given the heterogeneity of designs and outcomes, means that quantitative effect sizes are summarized narratively and cannot be statistically integrated across studies.

Implications for Future Research

Future research should prioritize studies from underrepresented Asian LMICs, particularly Indonesia, Vietnam, the Philippines, and South Asian countries beyond India. There is a critical need for primary studies that explicitly operationalize cultural variables within technology acceptance frameworks, moving beyond standard UTAUT/TAM constructs to incorporate dimensions such as collectivism scales, filial piety measures, and stigma inventories. Longitudinal designs are needed to capture how cultural determinants evolve over time as elderly populations gain technology exposure. Additionally, culturally-adapted versions of TAM and UTAUT that include constructs such as "face threat sensitivity", "intergenerational technology support", and "cultural health beliefs" should be developed and validated across multiple Asian LMIC contexts.

Conclusion

Cultural determinants exert pervasive influence on assistive health technology acceptance among older adults in Asian LMICs. Five themes were synthesized: filial piety and family dynamics, stigma and face culture, collectivist social norms, trust in traditional health practices, and culturally-mediated digital literacy gaps. These factors operate at individual, family, community, and societal levels and frequently exhibit dual directionality, simultaneously facilitating and inhibiting adoption. Because the available evidence is concentrated in East Asian LMIC settings, predominantly China, with only single studies from India and Thailand, the most defensible inference is that culturally-sensitive AHT design and implementation strategies are urgently warranted in East and South Asian LMIC settings, with cautious extrapolation to other Asian LMIC contexts pending further primary evidence. For framework development, the most actionable next steps are: (i) disaggregating UTAUT's Social Influence construct into separable family and peer components that can be modelled bidirectionally; (ii) integrating validated cultural constructs (eg., Dual Filial Piety Scale, face concern, gerontechnology anxiety) as moderators within UTAUT-style structural models; and (iii) prospective psychometric validation of these culturally adapted models in Southeast and South Asian LMIC samples.

Abbreviations

AHT, Assistive Health Technology; JBI, Joanna Briggs Institute; LMIC, Low- and Middle-Income Country; mHealth, Mobile Health; MMAT, Mixed Methods Appraisal Tool; PICo, Population, Interest, Context; PLS-SEM, Partial Least Squares Structural Equation Modeling; PRISMA, Preferred Reporting Items for Systematic Reviews and Meta-Analyses; SEM, Structural Equation Modeling; STAM, Senior Technology Acceptance Model; TAM, Technology Acceptance Model; UTAUT, Unified Theory of Acceptance and Use of Technology.

Data Sharing Statement

All data supporting the findings of this review are available from the OSF project page (https://osf.io/73a4v), including search result files, screening decisions, extraction spreadsheets, quality appraisal forms, and the PRISMA flow diagram.

Ethics Approval and Consent to Participate

As this study is a systematic review of previously published research, no ethics approval or participant consent was required.

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Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

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Disclosure

The authors report no conflicts of interest in this work.

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