Are We Ready to be e-Social Service Practitioners for Older Adults? Potential of Taiwanese Social Service College Students

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ABSTRACT The digitalization of society has changed the practices of social service professionals. The primary objective of this study was to explore knowledge of mobile health apps (mHealth), specifically a government-owned My Health Bank app, among Taiwanese social service college students. Whether these students can be the facilitators to promote mHealth apps’ adoption for older adults was examined as well. The results showed that their awareness of this government-owned mHealth app was low. However, their perceptions and attitudes toward the My Health Bank app and older adults were very positive. The findings of the present study indicated that the potential of promoting mobile health apps’ adoption for Taiwanese older adults through the support of prospective social service practitioners is reachable. The importance of mHealth adoption during the Coronavirus disease (COVID-19) pandemic was also discussed. Finally, the findings of this study provided several suggestions and research directions to support current and future social service practitioners to be well-prepared for the challenges of the digital society.

INDEX TERMS mHealth, older adults, social service, Taiwan

I. INTRODUCTION

Taiwan had a population of roughly 23.6 million in 2019, of which 3.6 million of them (approximately over 15.2%) reached 65 years old [1]. However, the population of Taiwan’s older adults reaching age 65 and above is projected to increase to 21% in 2026 [2]. Taiwanese older adults heavily rely on a National Health Insurance (NHI) system, which was introduced in 1995, in order to support public health for all people. In 2016, the “My Health Bank” app was launched via the National Health Insurance mobile app (NHI mobile app), which provides a wide range of services, such as a recent record of doctor visits and examination and test results. These services allow people to access their personal health information more effectively through their mobile devices.

When examining the Taiwan 2018-2019 National Health Insurance Annual Report, it noted that “as of June 30, 2018, [My Health Bank app] had approximately 715,000 users” [3, p. 59]. Another report indicated that “more than 920,000 people have registered to use [My Health Bank app] and demographics showed that 46% of users are aged between 31 and 50” [4]. The above references indicated that the majority of the 3.6 million Taiwanese older adults did not use the My Health Bank app, or they were unaware of it. To support older adults to access their personal health information, the NHI added the feature of family member management to the My Health Bank app. This ensures that people can access their older relatives’ health information. However, this family member management function is not an ideal solution for solitary elders [5].

During the COVID-19 pandemic in 2020, the My Health Bank introduced new features, such as purchasing face masks online. As a result, the registered users increased to five million as of September 2020 [6]. The above information illustrated the importance of promoting mobile health (mHealth) adoption, especially My Health Bank app, among
Taiwanese older adults in order to ensure that they can obtain their health information more effectively.

The importance of adopting mHealth and digital technologies by social service practitioners to provide effective services for clients is an emerging issue that has attracted attention by related professionals [7]-[9]. Some researchers have mentioned that it is crucial to develop a team of care services that consists of medical doctors, nurses, and social workers when building a virtual mobile health system [10]. Therefore, the potential of promoting mHealth awareness and adoption for older adults may be achievable if social service practitioners can teach them, especially during their regular contacts and visits. However, limited research has been conducted to examine the associations of knowledge of mHealth and service delivery for older adults among future social service practitioners who pursue related undergraduate degrees, including Taiwan. Therefore, the primary purpose of this study was to explore how future Taiwanese social service practitioners were educated about mHealth and how they perceived its association with older adults.

II. LITERATURE REVIEW

A. DIGITAL NATIVES AND DIGITAL IMMIGRANTS

The concept of Digital Natives versus Digital Immigrants was identified by Prensky [11]. According to [11], digital natives are people who were born in the era where “they have spent their entire lives surrounded by and using” different digital technologies such as computers, videogames, digital music players, and Internet (p. 1). On the contrary, digital immigrants are people who were born before those technologies were available, and they have to learn and adopt those technologies in their later lives. Based on the Digital Natives portion of this conceptual theory, current social service college students should have a great experience in terms of using digital technologies. This would allow them to have the potential for adoption of mHealth, which would further improve their future human service practice, specifically in terms of digital social service delivery competence.

B. NATIONAL HEALTH INSURANCE APP AND MY HEALTH BANK APP

Taiwan’s Health Insurance (NHI) system was introduced in 1995. The calculations of insurance premiums are based on six major job categories: civil servants, occupational union members, farmers and fishermen, inmates, low-income households, and veterans and dependents of deceased veterans. Due to human rights and social fairness, NHI coverage is also available to immigrant residents, foreign white-collar workers, international students, and citizens who live abroad. The improvement of cloud computing technology helps to connect insureds, health agencies, and the National Health Insurance Administration (NHIA). For example, the NHI MedCloud System provides several features of query systems for medical professionals to make quick judgments and clinical services, such as retrieval of dental treatment and drug allergy records [3].

The NHIA also introduced the “My Health Bank” app through the NHI mobile app for its insureds in 2016. This mHealth app provides a wide range of search services that include, but are not limited to: (1) inpatient, (2) outpatient, (3) dental records, (4) vaccinations, (5) allergic reactions, (6) prescribed drug use records, (7) examination reports, (8) organ donation preferences, (9) hospice care preferences, (10) reminders for recommended health checkups, and (11) self-input tracking system for height, weight, and blood pressure. In addition, during the COVID-19 pandemic in March of 2020, the National Health Insurance mobile app (NHI mobile app) introduced several new features to its users, including: (1) locations of nearby pharmacies where face masks are available, (2) online face mask purchases, and (3) a mask distribution system for legal foreigner residents [12][13]. All of these features provided by the “National Health Insurance mobile app” and its sub-app, the “My Health Bank,” ensure that users can access important health information more efficiently through their mobile devices.

C. MOBILE HEALTH (MHEALTH) FOR SOCIAL SERVICE

Many studies were conducted to explore mHealth from different perspectives. For example, some studies were conducted to examine features of hospital-owned mobile apps [14], awareness and attitudes toward smartphone-mediated mobile health held by the public [15], and promotion of exercise behaviors through mHealth [16]. The digitalization of society has also changed the ways of health care and social service delivery. For instance, some researchers emphasized the importance of adopting mHealth by social workers in order to support minority groups to solve their language barriers when seeking health services [8]. Other professionals noted that it is crucial to include the use of technology for practice into human service curricula for the purpose of enhancing the knowledge and competence of future social work practitioners [7]. The concept of mHealth apps and digital services specifically designed for social service practitioners has attracted attention by both social service and technology-related professionals [7, 9, 17 & 18]. As a result, the digitalization of society has promoted the concept of “e-Social Work” or “digital Social Work” in the social service field in order to meet the needs of clients more effectively [7 & 9].

D. ATTITUDES TOWARD ADAPTING AND PROMOTING MHEALTH APPS

Many mHealth apps have been created by both public [6 & 19] and private sectors [12 & 20] for the primary purpose of promoting health management and benefits. Some researchers have examined how the general public perceives practical issues of mHealth apps [15]. Other researchers have explored the factors that may improve the intention of mHealth adoption based on the concept of the Technology Acceptance Model (TAM), such as health benefits, perceived ease of use, and perceived usefulness [21].
Similarly, users’ feelings (e.g., autonomy, relatedness, perceived usefulness, and satisfaction) on the continued use of mHealth apps based on Self-Determination Theory were also examined [22]. Finally, the usability and usefulness of mHealth apps based on the Affordable Theory were explored to find out how people decide and select IT artifacts to actualize what they need and want [23]. The main goals of those research mentioned above were just a few samples to illustrate methods explored to promote the adoption of mHealth apps more effectively by their target population.

Studies were also conducted to explore whether different professionals can be regarded as the facilitators to promote the adoption of mHealth apps. For example, [24] and colleagues examined attitudes of French general practitioners in terms of their motivations (e.g., facilitate medical work and monitor follow-up care) and concerns (e.g., data privacy and certification of apps) about the prescription of mHealth apps for their patients. Similar research was also applied to Spanish nurses [25]. Also, researchers have explored if students can promote mHealth apps, such as Korean nursing students [26] and Saudi Arabian college students from public health, nursing, pharmacy, applied medical and medical programs [27].

Unlike students and professionals from medical and related backgrounds who are regarded as the pioneers to touch the issues of mHealth apps’ education and adoption, there is limited research about how social workers can use mHealth apps to improve their behavioral health services [17]. Some researchers have mentioned the importance of including mHealth and relevant technologies into social work practice [7]-[9]. However, [28] found that technology education in social service mainly focuses on distance education technology, visual media/devices, and communication technology (e.g., email and telemedicine), with less attention in mHealth apps. Thus, it is necessary to explore social service students’ knowledge of mHealth apps and their attitudes toward promoting them.

E. EXAMINING ATTITUDES TOWARD OLDER ADULTS
Developed by Gordon Allport, the concept of Contact Hypothesis was outlined in his book of The Nature of Prejudice, which was published in 1954 [29]. The original concept of Contact Hypothesis emphasizes that people may reduce their prejudice about the specific racial groups through contact experience [30]. The Contact Hypothesis was implemented in different studies concerning immigrants and foreign nationals, religious groups, and people with disabilities [13]. When translating the above concept of the Contact Hypothesis into the human service field, social service college students may be more knowledgeable in terms of useful functions of mHealth to meet the health needs of older adults due to their regular contacts and visits.

Due to the growth of the aging population, some researchers have explored attitudes and behaviors toward older adults held by college students and practitioners from health care and social service fields [31][32]. For example, [33] conducted a thorough literature review of 20 studies in terms of gerontological knowledge, ageist attitudes, and willingness to work in the field of aging held by students and current practitioners with social work and nursing backgrounds. Other investigators noted that it is essential to examine the roles of nurses, social workers, and physicians in relation to care management for older adults since they support them in different domains, such as care coordination and social needs assessment [34].

The Positive Education about Aging and Contact Experiences (PEACE) model was also developed to stress the importance of promoting accurate information about the aging process and intergenerational contact experience to reduce stereotypes, aging anxiety, and discrimination related to older adults [35]. For instance, the results of a study indicated that attitudes toward older adults could be changed through positive personal contact experience [36]. The above reviews are examples to demonstrate the importance of examining attitudes toward older adults held by health care and social service students and practitioners since they may have a higher possibility of being exposed to this population. Their attitudes toward older adults may more or less influence their current and future service delivery to them.

III. PURPOSE OF STUDY
As mentioned previously, while many studies were conducted to explore the adoption and promotion of mHealth apps among medical-related students and practitioners, there is very limited research from social service students and workers [17]. Therefore, the primary objective of this study was to explore the knowledge and attitude toward a government-owned mHealth app, “My Health Bank”, among Taiwanese social service college students. In addition, their attitudes toward older adults and whether they can be the facilitators to promote mHealth adoption for them were also examined and explored. Three research questions were developed to guide the purpose of the present study.

1. Are Taiwan social service college students aware of the My Health Bank app?
2. What are the general attitudes in terms of the importance of the primary functions of the My Health Bank for self and older adults held by social service college students?
3. What are the attitudes in terms of social value, service, and compassion toward older adults held by social service college students?

IV. METHOD
A. PARTICIPANTS
To better match the goals of this study, a purposive sampling technique was used to obtain valuable and appropriate information [37], “the reason for purposive sampling is the better matching of the sample to the aims and objectives of the research” (p. 2). A medium private teaching-oriented university in central Taiwan was selected to recruit...
participants to represent the perspectives of Taiwanese social service students. The total enrollment of this university was approximately 15,100 students in the spring semester of 2021. The researchers provided a thorough description of the study to the department heads and teachers of Social Work and Golden-Ager Industry Management. Upon agreement, willing professors and instructors contacted and recruited students who volunteered to join this anonymous study in their classes. One hundred ninety-four (194) university students from Departments of Social Work (n = 124) and Golden-Ager Industry Management (n = 70) participated in the study. Among these 194 participants, 35 (18%) were male, and 159 (82%) were female with a mean age of 19.4 years. One hundred twenty-nine (129) participants (66.5%) were (82%) were female with a mean age of 19.4 years. One hundred twenty-nine (129) participants (66.5%) were

B. MEASURES

1) ATTITUDES TOWARD MY HEALTH BANK APPLICATION (AMHB)

| Characteristic                                      | N   | Percent |
|-----------------------------------------------------|-----|---------|
| What are the most frequent mobile devices you use? (Mark all that apply) |     |         |
| Smartphone                                         | 192 | 99.0    |
| Laptop                                             | 154 | 79.4    |
| Tablet                                             | 148 | 76.3    |
| What types of mHealth apps do you use mostly? (Pick only one) |     |         |
| Women's health                                     | 93  | 48.0    |
| Exercise                                           | 41  | 21.1    |
| Diet and nutrition                                 | 23  | 11.9    |
| None                                               | 29  | 14.9    |
| Others (My Health Bank, Lifestyle)                 | 8   | 4.1     |
| What issues do you worry or are concerned about in terms of mHealth? (Mark all that apply) |     |         |
| Personal information security and privacy           | 146 | 73.5    |
| Ease of use                                        | 114 | 58.8    |
| Payment mechanism                                  | 99  | 51.0    |
| Software stability                                 | 60  | 30.9    |
| Hardware stability                                 | 27  | 13.9    |
| Have you heard of My Health Bank app?              |     |         |
| Never heard                                        | 157 | 80.9    |
| Heard but not downloaded                           | 32  | 16.5    |
| Heard and downloaded                               | 5   | 2.6     |
| Have you taken any mobile health informatics courses at school? |     |         |
| No                                                  | 187 | 96.4    |
| Yes                                                 | 7   | 3.6     |
| Have you taken any social service course related to older adults at school? |     |         |
| Yes                                                 | 118 | 60.8    |
| No                                                  | 76  | 39.2    |
| Have you completed an internship or were a volunteer in senior care facilities or related institutions for older adults? |     |         |
| Yes                                                 | 141 | 72.7    |
| No                                                  | 53  | 27.3    |

According to [38], mHealth can be defined “as the use of mobile devices [including] mobile phones, patient monitoring devices, personal digital assistants (PDAs) and wireless devices for medical and public health practice” (p. 27). In addition, the functions of mHealth can be grouped into three major types: accessing/providing health services, accessing/providing health information, and collecting health information.

The functions of mHealth apps are various depending on whether they are governmentally sponsored/operated or privately developed in a specific cultural or environmental context. For example, some researchers [15] developed a survey to measure the public’s general attitudes toward mHealth functions in Singaporean cultural context based on World Health Organization’s 3rd Global Survey on eHealth. Their survey items covered seven significant categories: managing appointments, accessing health records, health information/education, general health and fitness tracking, disease monitoring, medication management, and contacting healthcare professionals.

Similarly, the AMHB, which includes eleven items, was developed based on the primary functions of the My Health Bank created by the National Health Insurance System. These eleven items can be used to examine the important level of these functions perceived by the participants (see Table II). The eleven features are (1) inpatient, (2) outpatient, (3) dental records, (4) vaccinations, (5) allergic reactions, (6) prescribed drug use records, (7) examination reports, (8) organ donation preferences, (9) hospice care preferences, (10) reminders for recommended health checkups, and (11) self-input tracking system for height, weight, and blood pressure. These eleven items are meeting three significant mHealth functions defined by the World Health Organization mentioned above. All items were scored with 1 = Unimportant to 5 = Very Important. The AMHB has two subscales, and participants rate each item (stated function) in terms of the importance level for self and then for older adults. Content validity was confirmed by knowledgeable professionals who have experience with mHealth, gerontology, and human service backgrounds. In this study, an internal consistency reliability analysis of two dimensions of the AMHB produced Cronbach’s alpha values of .89 for the Important for Self subscale and .92 for the Important for older adults.

2) GERIATRIC ATTITUDES SCALE (GAS)

Developed by Reuben and colleagues, the GAS includes 14 items that examine four dimensions in terms of attitudes toward older adults [36][39]. The four dimensions are: (1) perceived social value of older adults (e.g., In general, older adults act too slow for modern society), (2) medical care provided to geriatric patients (e.g., Treatment of chronically ill older adults is hopeless), (3) compassion toward older adults (e.g., It is interesting listening to older adults’ accounts of their past experiences), and (4) distribution of societal
resources for older adults (e.g., _Older adults do not contribute much to society_).

Two items residing in the dimension of Distribution of Societal Resources for Older Adults were removed due to the differences between health care systems in the United States and Taiwan. These two items are _The federal government should reallocate money from Medicare to research on AIDS or pediatric diseases_, and _Medicare for older adults uses up too much human and material resources_. The remainder of the items were moved to the dimension of Perceived Social Value of Older Adults. In addition, three terms, “medical care,” “older people,” and “geriatric patients,” were changed to “service” and “older adults” in order to meet the objective of the study.

As a result, the Perceived Social Value of Older Adults dimension (PSOA) has four items, and the Compassion toward Older Adults dimension (CTOA) contains four items (see Table III). All twelve (12) items of the GAS were scored with 1 = _Strongly Disagree_ to 5 = _Strongly Agree_, and negative statements were reverse coded for scoring. An overall item mean score higher than 3 indicates that participants have positive attitudes toward older adults [36]. The higher item and overall mean scores indicate that participants have more positive attitudes toward older adults [40].

In this study, the results produced a Cronbach’s alpha value of .72 for the entire GAS. An internal consistency reliability analysis of three dimensions of GAS produced acceptable Cronbach’s alpha values of .68 for Perceived Social Value of Older Adults dimension (PSOA), .60 for Service Provided to Older Adults dimension (SPOA), and .68 for Compassion toward Older Adults (CTOA). Finally, a confirmatory factor analysis (CFA) was carried out to inspect the consistency of the GA scale. The criteria of convergent validity were set for at least .50 for factor loadings [41]. Results indicated that only one item (Item 7) in the Service Provided to Older Adults (SPOA) dimension did not meet the minimum criteria of factor loadings.

C. PROCEDURE

The Geriatric Attitudes Scale (GAS) was translated from English to Mandarin via the double translation technique. This ensures translations made by professionals who have proper knowledge in terms of related issues as well as language ability in English and Mandarin [42][43]. Due to academic backgrounds, students from two departments, Social Work and Golden-Ager Industry Management, were invited to participate in this anonymous study voluntarily through the assistance of department heads. The objective of this study was described in a letter with two surveys and one demographic sheet in which an informed consent statement was presented.

D. STATISTICAL ANALYSIS

To answer question one, descriptive data analysis was used to report background information associated with mHealth awareness among participants. To answer question two, data analysis procedures included several steps. At the beginning, the item means and standard deviation of two subscales (importance for self and importance for older adults) of the Attitudes toward My Health Bank app (AMHB) were calculated. Later, an Independent sample t-test was used to explore whether three demographic factors (gender, academic program, and year of study) influence participants’ general attitudes toward AMHB’s two subscales, respectively. The Independent sample t-test was used because each of these three demographic factors had only two categories. Finally, a Spearman correlation was also implemented to confirm the findings found from the Independent sample t-tests, respectively.

To answer question three, item mean, standard deviation, and a Geriatric Attitude Scale (GAS) composite score were calculated to examine attitudes toward older adults. The midpoint was set at 3.0 for all GAS items [39][40]. A one-way ANOVA was applied to explore whether three demographic factors (gender, academic program, and year of study) influenced participants’ overall attitudes toward older adults. Later, a series of independent sample t-tests were used to explore whether these three demographic features influenced attitudes toward older adults based on three subscales of the GAS, respectively. Similarly, an independent sample t-test was used to examine whether contact experience can influence participants’ overall attitudes toward older adults based on the entire Geriatric Attitudes Scale (GAS). A series of independent sample t-tests were implemented to examine possible influence of attitudes toward older adults based on the three subscales of the GAS.

V. RESULTS

A. AWARENESS OF MY HEALTH BANK APP

Several questions were included in the demographic sheet (see Table I) to examine awareness of the _My Health Bank_ app among our participants. Descriptive data analysis was used to report frequencies and percentages of categorical data. Firstly, the demographic information showed that our participants are “Digital Natives,” as almost all of 194 participants reported using a smartphone (n = 192), followed by a laptop (n = 154), and a tablet (n = 148) frequently. A high smartphone adoption (99%) may equip them to be facilitators to demonstrate and promote mHealth apps for older adults when they have opportunities to visit them in person. However, the results indicated that the majority of participants (80.9%) were unaware of “_My Health Bank_,” and a tiny proportion of the participants (2.6%) had heard about it and downloaded this app on their devices.

While a very low _My Health Bank_ awareness was found, it is significant to note that about 85% of all participants use different mHealth apps, such as women’s health (48%),...
exercise (21.1%), and diet and nutrition (11.9%). This information uncovered that our participants are comfortable using various mHealth apps. Finally, although our participants had a high adoption rate to mHealth apps, the majority of them did not take any mobile health informatics courses (96.4%) in school. A lack of enrollment in such classes from a human service perspective could be a potential barrier that may prevent future service practitioners from promoting appropriate mHealth apps to their clients, especially for older adults.

B. GENERAL ATTITUDES TOWARD MY HEALTH BANK FUNCTIONS (AMHB)

Participants perceived high levels of importance in terms of the 11 primary functions of the My Health Bank app. Most importantly, participants perceived that these 11 functions are more important for older adults ($M = 4.48, SD = .46$) than for themselves ($M = 4.15, SD = .51$). The results of a dependent $t$-test showed that this difference was statistically significant, $t(193) = 10.17, p < .001$. When examining the primary functions of the My Health Bank endorsed by the participants, they perceived that allergic reactions ($M = 4.42, SD = .70$), examination reports ($M = 4.38, SD = .64$), and as prescribed drug use records ($M = 4.26, SD = .70$) were the top three important functions for themselves. In addition, participants perceived that examination reports ($M = 4.72, SD = .50$), reminders for recommended health checkups ($M = 4.68, SD = .54$), and prescribed drug use records ($M = 4.63, SD = .59$) were the top three most important functions for older adults. The detailed information is presented in Table II.

Whether three demographic factors (gender, academic program, and year of study) were associated with the general attitudes of participants toward My Health Bank functions were examined as well. Due to the small sample size, two sophomore year students and six senior year students were regrouped into freshman and junior, respectively. Thus, the year of study was classified into freshman and junior. The results of an independent sample $t$-test showed that gender $t(193) = .19, p = .85$, academic program $t(193) = .88, p = .38$, and year of study $t(193) = -.92, p = .36$ did not influence participants’ general attitudes toward the subscale of Importance for Self that resided in AMHB. To confirm the findings found from an independent sample $t$-test mentioned above, a Spearman correlation was applied, and the results were identical. The results indicated that gender ($p = .05, p = .47$), academic program ($p = .06, p = .44$), and year of study ($p = .05, p = .47$) were not associated with the Importance for Self subscale.

We also examined whether these three demographic factors were associated with the Importance for Older Adults subscale. Identically, the findings of an independent sample $t$-test indicated that gender $t(193) = -.82, p = .42$, academic program $t(193) = .32, p = .75$, and year of study $t(193) = -1.19, p = .23$ did not influence participants’ general attitudes toward the subscale of Importance for Older Adults as well. Similarly, a Spearman correlation was used again and the outcomes were the same, indicating that gender ($p = .03, p = .66$), academic program ($p = .02, p = .83$), and year of study ($p = .06, p = .43$) were not associated with the Importance for Older Adults subscale. In summary, participants perceived all of these 11 primary functions of the My Health Bank app as important, especially for older adults, regardless of their demographic backgrounds.

C. ATTITUDES TOWARD OLDER ADULTS (GERIATRIC ATTITUDES SCALE)

The results (see Table III) showed an overall item mean of 3.49 for the entire Geriatric Attitudes Scale (GAS) and factor means for each of the following: Perceived Social Value of Older Adults (3.25), Service Provided to Older Adults (3.23), and Compassion toward Older Adults (3.78). The composite mean score for the GAS was 41.82, with a standard deviation of 5.39. The results indicated that participants have positive attitudes toward older adults, as the mean score of their overall GAS was over the midpoint of 3.0 ($M = 3.49, SD = .82$). Among these 12 items, item 12 was rated the highest, with $M = 4.20$, whereas item 6 was rated the lowest, with $M = 2.67$. The above information indicated that participants have high positive attitudes in terms of compassion toward older adults while having a negative perception concerning cognitive ability when people grow older. The detailed information is presented in Table III.

Later, a one-way ANOVA was used to examine whether gender, academic program, and year of study influence participants’ overall general attitudes toward older adults on the entire Geriatric Attitudes Scale (GAS). The results showed that gender ($F = 1.90, p = .17$) and academic program ($F = .03, p = .86$) were not associated with the GAS, except for the "year

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### TABLE II. Item analysis of the importance of my health bank functions (AMHB)

| App function | Important for Self | Important for Older Adults |
|--------------|-------------------|---------------------------|
|              | Mean (SD) Rank    | Mean (SD) Rank            |
| 1. Inpatient | 4.10 (.69) 7      | 4.47 (.68) 6              |
| 2. Outpatient| 4.09 (.71) 8      | 4.41 (.69) 9              |
| 3. Dental records | 3.88 (.74) 11  | 4.17 (.76) 11             |
| 4. Vaccinations | 4.20 (.67) 5   | 4.46 (.69) 7              |
| 5. Allergic reactions | 4.42 (.70) 1 | 4.62 (.64) 4              |
| 6. Prescribed drug use records | 4.26 (.70) 3 | 4.63 (.59) 3              |
| 7. Examination reports | 4.38 (.64) 2 | 4.72 (.50) 1              |
| 8. Organ donation | 3.94 (.82) 9 | 4.22 (.84) 10             |
| 9. Hospice care preferences | 3.93 (.79) 10 | 4.44 (.73) 8             |
| 10. Reminders for recommended health checkups | 4.24 (.69) 4 | 4.68 (.54) 2              |
| 11. Self-input tracking system for height, weight, and blood pressure | 4.18 (.71) 6 | 4.50 (.74) 5              |

Overall: 4.15 (.51) 4.48 (.46)

Note: Cronbach’s alpha is .89 for the Important for Self subscale; Cronbach’s alpha is .92 for the Important for Older Adults subscale.
TABLE III. Item analysis for the geriatric attitudes scale (GAS)

| Subscales & Items                      | Mean | SD  | Rank | Cronbach’s alpha |
|----------------------------------------|------|-----|------|------------------|
| **Perceived Social Value of Older Adults (PSOA)** |      |     |      |                  |
| 1. Older adults don’t contribute their fair share toward paying for their health care. | 3.26 | .86 | 3    | .68              |
| 2. In general, older adults act too slow for modern society. | 3.24 | .97 | 4    |                  |
| 3. It is society’s responsibility to provide health services for its older adults. | 3.30 | 1.03 | 2  |                  |
| 4. Older adults do not contribute much to society. | 3.96 | .95 | 1    |                  |
| **Compassion toward Older Adults (CTOA)** |      |     |      |                  |
| 5. If I have the choice, I’d rather see younger than older ones. | 3.32 | 1.06 | 2   |                  |
| 6. As people grow older, they become less organized and more confused. | 2.67 | .96 | 4    |                  |
| 7. Taking a medical history from older adults is frequently an ordeal. | 2.89 | .87 | 3    |                  |
| 8. Treatment of chronically ill older adults is hopeless. | 4.05 | .86 | 1    |                  |
| **Service Provided to Older Adults (SPOA)** |      |     |      |                  |
| 9. Most older adults are pleasant to be with. | 3.56 | .83 | 4    |                  |
| 10. Older adults tend to more appreciative of the services I provide than the younger clients. | 3.75 | .79 | 2    |                  |
| 11. I tend to pay more attention and have more sympathy toward my older clients than my younger clients. | 3.62 | .90 | 3    |                  |
| 12. It is interesting listening to older adults’ accounts of their past experiences. | 4.20 | .74 | 1    |                  |
| **Overall** | 3.49 | .82 |      | .72              |

Note: The response ranges from 1 (strongly disagree) to 5 (strongly agree). Negative statements were reverse coded for scoring (1, 2, 4, 5, 6, 7, and 8).

TABLE IV. Results of t-test and one-way ANOVA on subscale of gas by demographic features

| Subscales & Items                      | Gender | M   | SD  | df | t    | p    | One-way ANOVA |
|----------------------------------------|--------|-----|-----|----|------|------|--------------|
| Perceived Social Value of Older Adults (PSOA) | Male   | 13.00 | 2.72 | 192 | 1.38 | .17  | 1.90 .17     |
|                                         | Female | 13.90 | 2.72 | 192 | 1.83 | .07  |              |
| Compassion toward Older Adults (CTOA)   | Male   | 15.17 | 2.62 | 192 | -.13 | .89  |              |
|                                         | Female | 15.11 | 2.28 | 192 | 1.08 | .28  |              |

Note: PSOA= Perceived Social Value of Older Adults, CTOA= Compassion toward Older Adults

Later, an independent sample t-test was used to study whether these three demographic features influenced participants’ attitudes toward older adults based on three subscales of the GAS, respectively. The results showed that only “year of study” (t(192) = 2.85, p < .05) was statistically significantly associated with the subscale of Perceived Social Value of Older Adults (PSOA). This finding indicated that junior students had more positive attitudes toward the social value of older adults compared with first-year students (see Table IV).

Finally, we also explored whether previous contact experiences influence participants’ attitudes toward older adults. One hundred forty-one participants who reported they had completed an internship or were a volunteer in a senior care facility or an institution for the older adults were divided into two groups: freshmen (n = 86) and juniors (n = 55). The results of an independent sample t-test indicated that the “juniors” group (t(139) = 2.29, p < .05) was statistically significantly associated with the entire Geriatric Attitudes Scale (GAS). The results of another independent sample t-test showed that the “juniors” group (t(139) = 2.74, p < .05) was statistically significantly associated with the subscale of Perceived Social Value of Older Adults (PSOA). The above findings confirmed that participants (juniors) who were exposed to older adults and related issues longer tend to have more positive attitudes toward this population, especially in terms of their social value.

VI. DISCUSSION

A. AWARENESS OF MY HEALTH BANK APP AND AGING EDUCATION
Participants reported that their awareness of My Health Bank was low (see Table I). However, the majority of our participants (85.1%) reported that they had used different mHealth apps (e.g., women’s health, exercise, diet, and nutrition). This information indicated that the adoption rate of mHealth apps among our digital native generation is high. Therefore, it would be necessary for the National Health Insurance Administration (NHIA) to emphasize advertising for My Health Bank to the public. Advertising and promoting the government-owned mHealth apps would also serve many purposes, including educating and improving public health awareness and assisting the public to accommodate to digital social and health care service.

Fortunately, Taiwan NHIA has utilized TV commercials to promote the functions of the National Health Insurance mobile app and My Health Bank for the purpose of disseminating useful information during the COVID-19 pandemic in 2020, such as: where face masks are available in the nearby pharmacies, how to order face masks online, and how to access personal health information through the government-owned mHealth apps [12][13]. These should be a great start to help stakeholders understand the importance of the adoption of mHealth apps, especially during this public health emergency time.

Finally, among these 194 participants, 141 (72.7%) reported that they had completed an internship or were volunteers in a senior care facility or an institution for older adults. Also, 118 participants (60.8%) indicated that they had taken social service courses related to older adults. This information confirmed that our participants might have higher opportunities to deliver social services for older adults in the near future. However, only 7 participants (3.6%) reported that they had taken mHealth and related courses. This finding indicated that providing informatics courses of mHealth to social service college students would function as an important channel to increase their knowledge in digital service. This may ultimately benefit older adults when these prospective social service practitioners have the opportunity to promote digital service adoption to them. Older adults and their caregivers may also benefit from adopting mHealth apps that would allow them to access health information and needed services more effectively.

B. GENERAL ATTITUDES TOWARD MY HEALTH BANK FUNCTIONS (AMHB)

The results of AMHB scale indicated that our participants rated high levels of these 11 functions of the My Health Bank, as their overall mean scores exceeded the 4 point level for the Important for Self subscale and Important for the Older Adults subscale. Most significantly, they perceived that these functions are more important for older adults than for themselves, and a dependent t-test test showed that this difference was statistically significant. Among these 11 functions, participants perceived that prescribed drug use records (Item 6) and examination reports (Item 7) are two of the top three most important features of the My Health Bank for older adults and for themselves (see Table II). Overall, the findings provide valuable information about the potential of adopting My Health Bank by social service college students and promoting it to older adults. This mHealth adoption may also help students be well-prepared when serving in a mobile health service management team that consists of medical doctors, nurses, and social workers [10].

Since our participants rated high importance levels of these 11 functions of the My Health Bank, it is recommended that a focused effort on building a strong foundation in terms of the availability of mHealth courses for these social service students be developed. This would be one of the most effective methods for promoting mHealth knowledge. In addition, the information in terms of mHealth apps (e.g., health care, mental health, children, older adults, and people with disabilities) and digital services that are specifically designed for social service educators and future practitioners are available in books and journals [7, 9, 17 & 18]. Those would be valuable resources to enhance mHealth knowledge for prospective Taiwan social service practitioners. Finally, a course related to the government-owned mHealth apps should be available for social service students. This may also enable them to understand how to incorporate digital government resources to deliver social services, especially for clients with specific health concerns or medical needs.

C. ATTITUDES TOWARD OLDER ADULTS (GERIATRIC ATTITUDES SCALE)

The findings (see Table III) were encouraging because participants held positive attitudes toward older adults, especially in terms of compassion (Item 12), treatment of chronically ill (Item 8), and their contribution to society (Item 4). The compassion toward Older Adults (CTOA) subscale was rated highest by participants, which could be considered one of the potential indicators of their willingness to work with them in the future. However, two specific concerns were also identified. For example, participants agreed that when people grow old, they become less organized and more confused (Item 6). They also agreed that retrieval of medical history from older adults is frequently an ordeal (Item 7).

The above findings showed that an association of cognitive decline with aging could be a prevailed ageist belief among our participants. Aging stereotypes in terms of functional limitations frequently mentioned in Taiwan’s school textbooks could be one of the possible reasons [44]. Nevertheless, these findings demonstrated the importance of promoting adoption about the My Health Bank app for older adults as well as to the prospective social service practitioners because it may help all stakeholders to access medical history in a more effective manner. Also, some strategies can be used to reduce stereotypes among college students toward the older adults, such as: providing positive education about aging [35][45] and using posters, handbooks, and brochures to deliver proper aging knowledge [46].
Finally, participants who were junior students had more positive attitudes toward older adults than first-year students, specifically in terms of social value to them (see Table IV). Similarly, junior students who had completed an internship or were a volunteer in an organization for older adults also had more positive attitudes toward older adults than first-year students about social value. This finding also paralleled another study where the GAS was used to examine attitudinal differences toward older adults between geriatric faculty and first and second-year residents [39]. Thus, the findings mentioned above might confirm the effects of the Contact Hypothesis. In other words, having more intergenerational contact experiences with older adults, as well as having a more extended period of time to be exposed to aging education, might be the main methods to enhance participants’ positive attitudes toward older adults due to being more knowledgeable concerning this population [47].

VII. IMPLICATIONS FOR PRACTICE

The results of the present study demonstrated that the potential of facilitating mHealth apps’ adoption for Taiwanese older adults through the support of prospective social service practitioners is achievable. Social service students can be considered as a means to help older adults, especially for solitary elders, learn to adopt the My Health Bank when they conduct their internships in senior care facilities and related institutions.

Since participants reported a high importance level of the My Health Bank app functions, incorporating the basic concept of mobile health apps and digital technologies into the social service curriculum would be a great start. For example, online mask purchases began to be available in Taiwan under the umbrella of the National Health Insurance Administration’s mobile app during the Coronavirus disease (COVID-19) outbreak in the March of 2020 [13]. This app feature not only reduces time waiting in a long line to purchase masks but is also a great example to help students to realize the connection between mHealth and social services that may allow older adults to receive services and meet their needs more conveniently.

It would also be a good idea to promote mHealth through the assistance of senior learning centers since there were 474 of them available in 2019 [48]. Also, directors of academic departments with degrees in social work or related programs (i.e., gerontology, human services, rehabilitative service) should examine students’ attitudes toward older adults and provide proper aging education for the purpose of reducing stereotypes concerning associations of functional limitations and aging [35], [45], [47]. Providing proper aging education would also help future social service practitioners to be well-prepared for serving the aging society.

VIII. LIMITATIONS AND FUTURE RESEARCH

The findings of this study should not be generalized to represent the majority of Taiwanese social service students’ perceptions toward mHealth and older adults since over a dozen schools are providing similar academic degrees. Also, the mean age of participants in the present study is 19.4 years, which limits the generalizability of opinions for older undergraduate students, graduate students, and current social service practitioners. Researchers should explore similar perceptions from the perspectives of senior students as well as experienced social service practitioners. The results may be valuable to explore what kinds of strengths and challenges they may encounter when they are thinking about delivering mHealth and related services in this digital society.

The reasons for the low adoption rate of the My Health Bank app among the older adults in Taiwan may be influenced by their technological knowledge and personal need [49]. This study did not explore specific theories or models related to mHealth adoption among our participants, such as Technology Acceptance Model (TAM), Self-Determination Theory, and Affordable Theory mentioned in the literature. However, results indicated that the perceived usefulness of My Health Bank functions is the primary key factor that may facilitate adoption and promotion from the perspectives of Taiwanese social service students.

Therefore, researchers should examine how social service students, related practitioners, and older adults perceive mHealth apps and their technology readiness and acceptance levels, especially whether the COVID-19 pandemic has impacted their intention of mHealth adoption. Those research directions would also help software engineering and social services professionals create easy and useful mHealth apps specifically designed for social service practitioners and older users in their cultural contexts. This might be helpful to facilitate and promote the concept of e-social service for serving the elderly better in different places.

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