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Improving the Continuum of Elderly Care through ICOPE Mobile App – A Pilot Study among Lebanese Healthcare Practitioners

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Abstract. The world health organization (WHO) published the ICOPE (Integrated Care for Older People) mobile application in 2017, intended to screen for intrinsic capacity (IC) decline (mobility, vision, hearing, cognition, mood and , nutrition) and provide a comprehensive assessment and treatment plan. Using the technology acceptance model (TAM), this study looks at the potential for introducing the ICOPE app to healthcare professionals (HCPs) in Lebanon and the antecedents for adoption. We conduct our pilot study through a data collection survey from HCPs practicing across Lebanon. We built our statistical model on SMART PLS 3 based on initial hypotheses, after performing a descriptive analysis on the responses. The statistical analysis suggests that job relevance affects perceived usefulness of the ICOPE mobile app, the experience with technology influences perceived ease of use and perceived usefulness affects the intention to use the app. Given that the healthcare sector is increasingly adopting digital health tools, it is advised that the app be introduced on a bigger scale with complete training sessions to enable greater adoption and to improve the circle of care. This approach will help enhance the quality of geriatric care in Lebanon, encourage a multidisciplinary approach, and therefore promote healthy aging.

Keywords: ICOPE, digital health, intrinsic capacity, healthy aging, continuum of care, TAM.

1 Introduction

Older individuals tend to have a lower health-related quality of life, often without equal access to healthcare services¹. They may lack knowledge about their health, and one might view decline as a "natural part of aging." This can result in missed opportunities to reverse or delay declines through appropriate monitoring and care². Further, health

¹ <https://www.who.int/news-room/fact-sheets/detail/ageing-and-health>

² <https://apps.who.int/iris/handle/10665/353553>

care professionals (HCPs) may fail to recognize early indicators of intrinsic capacity decline, such as slowed movement or diminished muscle strength.

In response, the WHO published the Integrated Care for Older People (ICOPE) program in 2017³, to guide HCPs to carry out person-centered approach on the community level and engage the patient in their own care and self-evaluation. This program integrates a mobile App available free on the Google Play and Apple App Stores. The App is a doorway to a more comprehensive assessment of the health and social care needs of older people that leads to the creation of a tailored care plan (fig.1).

1.1 Motivation

During the current economic crisis in Lebanon, hospitals resort to ration their services and prioritize patients⁴, complicated by the exodus of nurses and physicians. ICOPE is to provide health services, anytime and anywhere, to anyone, by removing geographical, temporal, and other barriers. Real-world case studies from different countries demonstrate that ICOPE is implementable in various contexts³. Additionally, they highlight the importance of local co-design and modification to fit the local environment and maximize workforce involvement and training.

At the time of this study, ICOPE is still new to the medical field in Lebanon. We, therefore, find it beneficial to introduce the ICOPE app to HCPs and explore the factors related to its adoption. That is, we intend to answer the following question: What are the factors that can influence the intention to use of the ICOPE mobile app by HCPs in Lebanon?



Fig.1: ICOPE (Source: ICOPE Handbook for testing⁵, WHO, page 12)

³ <http://www.ncbi.nlm.nih.gov/books/NBK488250/>

⁴ <https://www.msf.org/healthcare-system-lebanon-crumbles-amidst-political-and-economic-crisis>

⁵ <https://www.who.int/publications/i/item/WHO-FWC-ALC-19.1>

2 Background

2.1 Digital Health

Digital health interventions have the potential to facilitate the integration of all health system levels, in terms of engaging various healthcare providers and caregivers [1]. Mobile health, a more portable component of digital health, accelerates health service provision, reduces the costs of service delivery, and decreases the risk of morbidity and mortality [2]. Today, limited digital health interventions were implemented in low-and middle-income countries, including Lebanon [3], where, the appetite for adoption of eHealth, may be favorable [4]. This is also in line with the national E-health program established by the ministry of public health (MOPH) according to decision No.1/227 of 04/03/2013⁶.

2.2 Healthy Aging and Intrinsic Capacity

Seniors require frequent doctor visits and checkups to monitor their health status. A delay consulting with a healthcare provider to assess their health state, leads to prolonged hospital stays once patients are admitted, while seeing a faster decline in their intrinsic capacity (i.e. Mobility, vision, hearing, cognition, mood, nutrition), which has been associated with the onset of autonomy decline, falls, and death during a 3-year follow-up [5]. This will generate more dependency and the need for caregivers and higher healthcare expenditure. Frailty is common among elderly residents of residential facilities [6] that increases the risk of poor health outcomes such as falls, incident disability, hospitalization, and mortality [7].

2.3 Adoption of ICOPE

The Integrated treatment for Older People (ICOPE) program, which the WHO issued in 2017, serves as a manual for HCPs on how to implement a person-centered approach at the community level and involve patients in their own treatment and self-evaluation. In low and middle-income countries, respondents to the WHO survey of readiness to adopt ICOPE at the services and systems level identified training to be especially important for the detection and evaluation of intrinsic capability declines, the assessment and control of the environment, and the creation of individualized care plans⁷.

3 Approach

We conduct a pilot study with healthcare professionals practicing all over Lebanon to assess the intention to use ICOPE mobile health tool in their practice, to screen and assess possible IC declines in elderlies.

⁶ <https://moph.gov.lb/en/Pages/6/2651/national-e-health-program>

⁷ <https://www.who.int/publications/i/item/WHO-FWC-ALC-19.1>

3.1 Research Model

Technology acceptance models (TAM) is a theoretical model to assess people's perceptions regarding the adoption of innovations [8]. According to TAM, a person's technology use behavior is influenced by their attitude toward using technology, which is predicted by how much they believe using a technology will improve their task performance (perceived usefulness) and how much they believe using a technology will require little to no significant effort (perceived ease of use). Studies using TAM have extended the model to cover multiple contexts (TAM2, etc.), for exploring usage and acceptance behavior towards technology [9]. Others have linked societal impact, user-friendly conditions, user attitudes, and user behavior to ease of use and usefulness when assessing users' intentions to use health information systems [10]. Lately, the Technology Acceptance Model (TAM) was used to evaluate adoption of digital apps in the case of Alzheimer dementia for example [11]. For our study, we used a modified TAM to achieve our objectives. We modified the model by eliminating the subjective norm since this construct is generally found to be a weak predictor of intentions [12]. We developed our model in figure 2, based on the extended model of Venkatesh and Davis [8] and following some similar studies conducted in similar contexts [13].

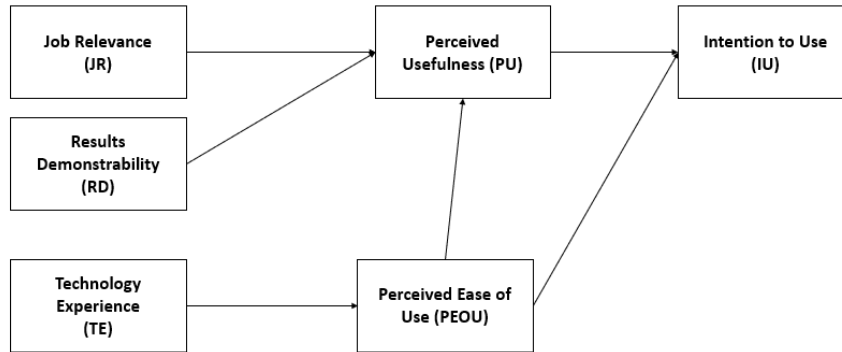


Fig. 2. Our Research Model for ICOPE adoption

3.1.1 Results Demonstrability

Results Demonstrability is the degree to which the results of using a system are tangible and communicable. A survey conducted among Quebec physicians identified that one of the factors that influenced the acceptance of using electronic health records was demonstrability of the results [14]. In our study, results demonstrability indicates the capability of ICOPE to assess for IC declines and to supply accurate information [15]. ICOPE focuses on optimizing the intrinsic capacity (IC) of the elderly and functional abilities as key to healthy aging. Moreover, the association between intrinsic capacity measured by the ICOPE App at baseline and the incidence of frailty in community-dwelling older adults was assessed during 1-year follow-up in 2021 [16]. Results have

shown that ICOPE App might identify individuals at higher risk of frailty, functional decline, and health adverse outcomes. At the level of population health, ICOPE's aim is to reduce the economic burden and influence national guidelines to support the inclusion of related services in primary care programs⁸. Findings have revealed that 69.1% of subjects experienced reductions in at least one IC measure with the use of this app [17]. In the survey, we focus on evaluating whether HCPs perceive ICOPE's capacity to assess declines in intrinsic capacity (IC) as apparent, its provision of accurate information, and their inclination to depend on the results generated by the application. Hence, our First hypothesis is:

H1: Results demonstrability of ICOPE mobile app affects its Perceived Usefulness.

3.1.2 Job Relevance

ICOPE provides a self-administered screening tool and assessment of a person's IC to engage patients in their own care and self-evaluation. ICOPE App's implementation would bridge the gap between health care professionals and their patients and will allow for self-screening by the elderly, their families or caregiver. The effects of Job Relevance (relevance to deliver of care and fit in examination routine) have been reviewed relative to technology acceptance [19; 20]. We evaluate the job relevance among HCPs by asking them whether they perceive the usage of ICOPE as relevant to care delivery and if they consider integrating it into their examination routine. We therefore hypothesize that:

H2: Job relevance of ICOPE mobile app affects its Perceived Usefulness.

3.1.3 Experience with Technology

ICOPE mobile app includes screening through questions and easy tests, to help a community health worker, family member, home caregiver, or social worker to test for IC decline as a first step⁸. A decline in one or more intrinsic capacity areas would sound an alarm, enabling the medical staff to act [21]. The second step of the app, which examines each IC alone, would determine if the elderly person should visit a primary care clinic for a more thorough evaluation – as a comprehensive assessment and development of the care plan usually require a trained health professional in a primary healthcare setting. The adoption of the ICOPE mobile application as a tool for geriatric care remains limited within the healthcare workforce, as findings from a cross-sectional study in Indonesia indicate [22]. The relatively recent introduction of the ICOPE application may be the reason for a slow adoption. In the survey, HCPs indicated how easily they could learn to use ICOPE, its potential interference with patient examinations, the clarity of interaction, willingness to use the app with adequate training, and data protection concerns. Therefore, our third hypothesis states:

⁸ <http://www.ncbi.nlm.nih.gov/books/NBK488250/>

H3: Experience in using Technology of ICOPE mobile app user affects its Perceived Usefulness.

3.1.4 Perceived Ease of Use and Perceived usefulness

According to TAM theory, perceived usefulness and perceived ease of use operate as a mediator between external variables (such system attributes, the development process, and training) and intention to use [8]. We asked HCPs to provide input on how easily they can achieve their goals with ICOPE; whether they believe using the ICOPE mobile app's initial step (taking about 6 minutes) will save them time; how ICOPE might enhance their assessment of elderly patients; and its overall usefulness in their practice. Accordingly, we assume the following:

H4: Perceived usefulness, indicated by the perception that the technology will serve the best interest of the user, in a rapid, self-examination, affects intention to use of ICOPE mobile app by HCPs.

H5: Perceived ease of use affects intention to use of mobile ICOPE mobile app by HCPs.

H6: Perceived ease of use affects perceived usefulness of ICOPE mobile app by HCPs.

3.2 Data Collection

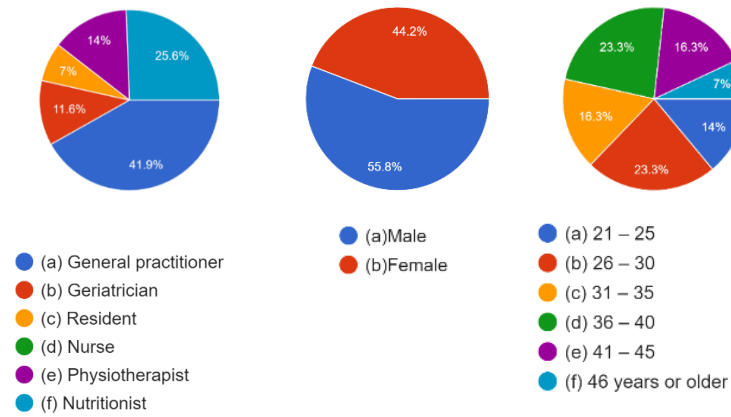
We performed a convenience sampling of multidisciplinary HCPs practicing in Lebanon with at least 2 years' experience providing care to older people, as recommended by the ready phase of WHO. Our sample size agrees with the 10 times (the number of inner or outer model connections that can point at any one latent variable in the model [23]). We collected the participant contact information from published emails on hospitals websites and through referrals from our contacts. We planned to collect data from 50 informants after we contact our potential list of HCPs (about 120). Recruitment was via email listing from websites of hospital across Lebanon. The data collection tool used is a questionnaire prepared for the study (see Appendix). Some questions were inspired from the WHO ICOPE ready phase⁹. The questionnaire is composed of three parts, the first part includes information about demographics such as age, gender, and title, the second part includes information about technology experience and the third segment is about the attitudes towards the ICOPE mobile app. After getting the approval of the USJ ethics committee in Jan 20 of 2023, we started with an initial pilot test study with 10 HCPs practicing all over Lebanon to test the questionnaire. This step is to assess the feasibility of the study and estimate the time needed for the survey.

We reformulated the questionnaire on Google docs (in English, which is not an issue since the Lebanese HCP population is fluent in English). We included an informative section on ICOPE, covering instruction for use and the different components.

⁹ <http://www.ncbi.nlm.nih.gov/books/NBK488250/>

4 Results

Respondents (43 HCPs participated) were a representative sample of healthcare professions, general practitioners (41.9%), followed by nutritionists (25.6%), physiotherapists (14%), geriatricians (11.6%), and residents (7%) (Figure 3). The respondents were 55.8% males and 44.2% being females (Figure 4). The age range of the respondents was diverse, with the largest proportion of respondents falling in the age range of 26-40 years. Specifically, 23.3% of respondents were between 26 and 30 years old, 16.3% were between 31 and 35 years old, 23.3% were between 36 and 40 years old. The age range of 21-25 years and 41-45 years had equal representation with 14% of respondents each, while 7% of the respondents were 46 years or older (Figure 5).



Informant Demographics - Fig. 3; Practice Fig. 4; Gender & Fig. 5. Age

We developed our model using SEM-PLS via Smart PLS 3.0. We first evaluate the measurement model (part of the model that examines relationship between the latent variables and their measures) and then the structural model to examine the relationship between the latent variables.

4.1 Evaluation of the Measurement Model

The model is a reflective construct; therefore, construct validation can be obtained through Confirmatory Factor Analysis (CFA) (i.e. convergent and discriminant validity) and reliability testing (i.e. Cronbach's Alpha) is appropriate [23]. We conduct a factor analysis on the construct to determine the validity (accuracy) and reliability (consistency).

Construct reliability indicates how much variance of each indicator is explained by the construct. Indicator reliability of greater than .707, means that 50% of the indicators' variance is explained by the construct. The construct reliability can be assessed from the Cronbach's alpha value and the composite reliability of each construct in table 2. The recommended composite reliability and Cronbach's alpha values are more than 0.7 [23]. However, for our construct of PEOU we accept a Cronbach Alpha of 0.652 since RhoA (0.751) and composite reliability (0.845) are higher. These values are acceptable by research [23]. The reliability test results in the table above show that all constructs have composite reliability.

	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
EXP w/ TECH	0.807	0.810	0.912	0.838
INTENTION	1.000	1.000	1.000	1.000
JOB RELEVANCE	0.877	0.877	0.942	0.890
PEOU	0.652	0.751	0.845	0.733
PU	0.908	0.916	0.943	0.845
RESULTS DEM	1.000	1.000	1.000	1.000

Table 2. Construct reliability

Discriminant Validity check is done to ensure that each concept of each latent variable is different from other latent variables. The results of discriminant validity testing using the AVE square value. The model has good discriminant validity if the AVE squared value of each exogenous construct (the value on the diagonal) exceeds the correlation between this construct and other constructs (values below the diagonal). We confirm Discriminant Validity by looking at the Fornell-Larcker Criterion Value are obtained as referred to in Table 3.

	EXP w/ TECH	INTENTION	JOB RELEVANCE	PEOU	PU	RESULTS DEM
EXP w/ TECH	0.915					
INTENTION	0.636	1.000				
JOB RELEVANCE	0.728	0.833	0.943			
PEOU	0.764	0.623	0.646	0.856		
PU	0.651	0.821	0.721	0.674	0.919	
RESULTS DEM	0.586	0.665	0.652	0.612	0.612	1.000

Table 3. Discriminant Validity - Fornell-Larcker Criterion.

We run our PLS algorithm and reduce the indicator variables to reach Convergent Validity and Reliability (PLS Algorithm), based on our literature reference, indicators with lower loadings are sometimes retained to maintain the validity of the construct (indicators < 0.40 are eliminated).

We complete the Convergent Validity by looking at the loading factor value of each indicator against the construct. A factor weight of 0.7 or more indicates sufficiently strong validation to explain latent constructs [23]. The minimum acceptable loading factor is 0.7, if the AVE value of each construct is > 0.5 (Hair et al., 2019) which it is in our case. In this study, the AVE value for each construct is above 0.5 and based on the estimation results of the PLS model in the picture below, all indicators have a loading factor value above 0.7 so that the model has met the convergent validity requirements.

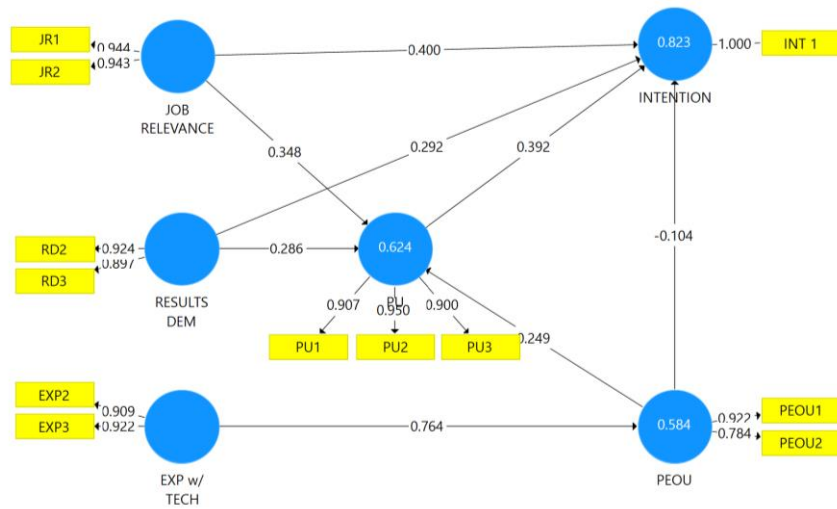


Fig. 3. Valid Model - with outer loading factors

4.2 Structural Model Analysis

Our model produced R² values of .823, .624 and .584 for intention to use, perceived usefulness, and perceived ease of use respectively. These moderate to substantial values reinforce the value of our study and the findings [23]. They indicate that 80% of the variability in the outcome in our model is explained by the variables in this study. We then conduct hypotheses testing (Bootstrapping) to identify the supported hypotheses: A p-value less than 0.05 (typically ≤ 0.05) is considered statistically significant [23].

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Values
EXP w/ TECH -> PEOU	0.764	0.770	0.059	13.036	0.000
JOB RELEVANCE -> INTENTION	0.400	0.404	0.124	3.224	0.001
JOB RELEVANCE -> PU	0.348	0.336	0.164	2.118	0.035
PEOU -> INTENTION	-0.104	-0.116	0.105	0.993	0.321
PEOU -> PU	0.249	0.271	0.129	1.925	0.055
PU -> INTENTION	0.392	0.391	0.136	2.895	0.004
RESULTS DEM -> INTENTION	0.292	0.301	0.121	2.419	0.016
RESULTS DEM -> PU	0.286	0.279	0.152	1.880	0.061

Table 4. Hypotheses Test.

4.2.1 Supported Hypotheses

Based on the information provided in table 4, we can analyze which hypotheses were supported by looking at the statistical significance and direction of the values for each variable. Overall, the statistical analysis provides some support for H2, H3 and H4:

Job relevance (JR) and perceived usefulness has a standard deviation of 0.164 and a p-value of 0.0035, which suggests that there is evidence to support H2. While Experience with technology and perceived ease of use has a standard deviation 0.059 and a p-value of 0.000 which suggests that there is strong evidence to support H3, and that experience with technology may be an important factor influencing the intention to use of the ICOPE mobile app among healthcare professionals in Lebanon. By observing the T-statistics, we find a very high degree of confidence of the predictor between experience with technology and PEOU (T much greater than 2) – which makes good sense in our case of adoption of mobile technology [23].

Finally, Perceived usefulness and intention to use has a standard deviation of 0.152 and a p-value of 0.004, which suggests that there is evidence to support H4 that connects the perception that the technology will serve the best interest of the user, in a rapid, self-examination, with the intention to use of ICOPE mobile app by HCPs.

5 Discussion

Community health and care professionals may implement the suggestions presented in the ICOPE Guidelines by the ICOPE guidance for person-centered evaluation and routes in primary care, also known as the ICOPE Handbook. The Handbook supports the development of individualized care plans by helping with goal-setting, screening for loss in a variety of intrinsic ability domains, and evaluating health and social care needs. Multiple interventions to manage decreases in intrinsic capacity, offer social care and support, encourage self-management, and assist caregivers may be included in the care plan. Cognitive decline, restricted movement, malnourishment, vision impairment, hearing loss, and depressive symptoms are among the areas of intrinsic ability. Our study demonstrated that HCPs have the intention to use the ICOPE mobile app. From these findings, we can draw a few observations linking the potential for improving ICOPE adoption through targeted training programs, building the awareness of ICOPE's benefits, limitations, among the care practitioners and emphasizing the social, managerial and organizational implications.

5.1 Training programs

We believe that to encourage healthcare practitioners in Lebanon to adopt and make use of the ICOPE mobile app, it is advised that training programs be put in place to improve the app's usability and experience. This is because of the significant correlation between the experience with technology variable and the app's perceived usefulness shown in table 4. Measures, such as planning extensive training sessions provided by the Ministry of Public Health, or other institutions, would to give healthcare personnel the knowledge and abilities they need to use the app efficiently. Such programs have shown to improve adoption of technology by how healthcare professionals [24]. In a study by [25], found that while most physicians had positive attitudes towards EMRs, their lack of training in using these systems was a significant barrier to their adoption. Training was also highlighted as particularly crucial for screening and assessment of declines in intrinsic capacity in the micro survey of the ICOPE ready phase¹⁰ and, for lower-middle-income countries, for the assessment and management of environment as well as the development of personalized care plans. Therefore, healthcare organizations in Lebanon may benefit from providing regular training opportunities to healthcare professionals to promote the adoption and successful use of the ICOPE guidelines through the mobile app.

5.2 Awareness of ICOPE's benefits, limitations

In order to improve healthcare workers' intention to use the ICOPE mobile app, we found that its relevance to their jobs (Table 4). Healthcare professionals can understand how the ICOPE app can improve their efficacy and efficiency in providing geriatric care by highlighting the app's connection to their jobs. For instance, showing how the app improves coordination of care among interdisciplinary teams, simplifies documentation procedures and improves communication with older persons and their families can show the app's immediate influence on their daily workflow. This then places ICOPE as an effective instrument for value co-creation that leverage multiple actors in the healthcare ecosystem in the care of patients [26]. Furthermore, demonstrating the app's assistance for evidence-based decision-making and its facilitation of customized care plans catered to the need of each older senior may increase its usefulness. This result is in line with earlier studies that stressed the significance of job relevance in encouraging technology adoption among healthcare practitioners [27]. The study findings suggest that the use of health information technology is a complex behavior that is influenced by a variety of factors, including user characteristics, perceived usefulness and ease of use, training and support, system quality, social influence, and external environment.

The ICOPE mobile app's result demonstrability is closely linked to the intention of healthcare professionals in Lebanon to use it. These results highlight the significance of effectively highlighting the app's features and practical advantages to healthcare professionals, as doing so directly affects their readiness to incorporate it into their regular

¹⁰ <http://www.ncbi.nlm.nih.gov/books/NBK488250/>

practices. Offering user-friendly resources, such as video tutorials, user guides, and testimonials, will help to further enhance HCPs understanding of the app's advantages and motivate their readiness to incorporate it into their routine practices. This in turn will ensure effective result demonstrability. For instance, AlQudah et al [28] discovered that result demonstrability had a substantial impact on how valuable people thought electronic health records (EHR) were. Similar to this, Gow et al. [29] study discovered that result demonstrability was one of the crucial variables influencing healthcare practitioners in Malaysia to utilize mobile health applications. These results highlight the value of reliable evidence and measurable results in encouraging the adoption of digital healthcare systems. It raises concerns about how transparency and an in-depth explanation of the app's capabilities can affect healthcare professionals' decisions.

5.3 Social, managerial and organizational implications.

The emergence of multi-sided platform services such as ICOPE, within the medical sectors an effective mechanism for promoting and facilitating multidisciplinary collaboration in the field of geriatrics. The app encourages a holistic approach to elderly care by bringing together knowledge from multiple professions, including geriatricians, nutritionists, nurses, physiotherapists, and more. A study in China by Ma et al, [17] found that the app effectively improves team member coordination and communication, enabling a seamless flow of information and the effective use of resources. The ICOPE app empowers various healthcare providers to collaborate effectively, ultimately resulting in improved patient outcomes and complete geriatric care, thanks to its user-friendly UI and real-time messaging features. Consistent attempts to simplify the interface to improve usability, accessibility and reduce the learning curve may need to be made in this context, so to improve the accessibility and adoption of ICOPE [30].

Inevitably, ICOPE and other mobile and accessible tools, promote the integration of care that enables coordination among practitioners to provide care that is understood by all. Instruments such as ICOPE would improve access to care by integrating into a digital care ecosystem [1] and promote caregiver interaction [26] by democratizing navigation and coordination of care among the patient's care circle. Health systems with effective patient care coordination through the necessary tools, culture, and leadership foster teamwork and communication between physicians and other experts. For patients, this means a smooth passage through the healthcare system and a continuity of care for an enhanced experience and improved outcome.

6 Conclusion

In conclusion, our study has revealed significant implications for the future adoption of digital health in the healthcare sector, particularly in the context of geriatric care in Lebanon. Healthcare professionals are willing to use the ICOPE mobile app in their practice. By promoting this integrated approach, and showing the results of this study, the ICOPE app has the potential for adoption that could maintain IC and slow down declines in Lebanese seniors, while at the same time remain cost-friendly to HCP users

considering the economic situation in Lebanon. The study did not only assess the acceptance potential among HCPs in using the ICOPE mobile app, but it also promoted the ICOPE guidelines. The findings of this study contribute to a better understanding of the acceptance and adoption of the ICOPE app in Lebanon, which in turn hold promises for future implementation.

The outcomes of this pilot study may serve as a roadmap for future initiatives aimed at removing obstacles and encouraging ICOPE app usage among HCPs. Improved testing, evaluation, and treatment strategies for intrinsic capacity decline in areas including mobility, vision, hearing, cognition, mood, and nutrition may result from this. Finally, by promoting healthy aging and reducing the effects of frailty and malnutrition, the successful integration of the ICOPE app into routine clinical practice has the potential to enhance the overall health and well-being of the aged population in Lebanon.

6.1 Contribution and limitations

This study is a first step toward realizing the potential of digital health solutions and building a more durable and efficient care environment for older people considering the ongoing challenges the healthcare system in Lebanon is continuing to face. The results highlight the significance of ongoing research and teamwork to remove obstacles and encourage the adoption of cutting-edge technologies in healthcare, in line with the objective of delivering comprehensive, integrated care for elderly people in Lebanon and worldwide.

It is important to consider both the strengths and limitations of our research. The study's inclusion of different healthcare specialties and geographical areas in Lebanon, is one of its key strengths. This variety improves the findings' generalizability and allows a deeper comprehension of HCPs' attitudes on app adoption. Additionally, the usage of an email-based questionnaire enables effective data gathering and analysis. However, there are limitations to consider. First off, the study's generalizability of the findings may be constrained by the very small sample size of 43 respondents. A bigger sample would give a more complete picture of the intentions to use of HCPs for the ICOPE app.

Another potential limitation of the study is that informants are approached via email only. There may be bias from the fact that the sample consists of individuals who are already digitally inclined, as email usage typically requires some level of technological proficiency. However, it is important to note that even though email is a digital platform, it does not necessarily imply universal ease of use of technology. Despite this limitation, the choice of email as a means of communication is justified due to its widespread availability and convenience for reaching many participants efficiently.

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Appendix: Survey Questions and Possible Answers

1. Gender: Male, Female
2. Age: 20 years or younger, 21 – 25, 26 – 30, 31 – 35, 36 – 40, 41 – 45, 46 years or older

3. Practice: General practitioner, Geriatrician , Resident, Nurse, Physiotherapist. Nutritionist
4. Governorate of practice, Akkar, Baalbeck-Hermel, Beirut, Bekaa, Mount Lebanon, North Lebanon, Nabatiyeh South Lebanon

The following questions follow a 5-Point Likert Scale –:

Strongly Disagree; Disagree; Neutral; Agree; Strongly Agree

5. The usage of ICOPE is relevant to the delivery of care.
6. Based on my understanding of ICOPE, I would fit it in my examination routine
7. The results of using ICOPE will be clear to me.
8. I would have difficulty explaining why using ICOPE may or may not be beneficial.
9. ICOPE is capable to assess for IC declines.
10. I will rely on the ICOPE mobile app results to supply accurate information.
11. I will easily acquire the skills to perform it
12. ICOPE will not interfere in my examination of the patient.
13. My interaction with ICOPE will be clear and understandable.
14. I will use ICOPE mobile app if I receive adequate training.
15. I am skeptical about data protection while using the ICOPE mobile app.
16. It will be easy to get ICOPE to do what I want it to do.
17. Given that completing the first step in ICOPE mobile app takes around 6 minutes, I believe it will save me time.
18. ICOPE will improve my assessment of elderly patients.
19. ICOPE could enhance my ability to achieve the desired result of the examination.
20. ICOPE could be useful in my job.
21. I intend to use ICOPE.