Research Article,

Functional Assessment of Currently Employed Technology Scale (FACETS) 4.0: Update on a Brief Intake Instrument to Facilitate Treatment Planning and Communication with Patients

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Abstract:

In the absence of data indicating that older adults utilize information technology (IT) for communicating with health care providers or insurers, Medicare, private insurers and providers of health care have increasingly defaulted to use of websites and IT for patient communication. The Functional Assessment of Currently Employed Technology Scale (FACETS) assesses an individual's use of various information technologies (its). Research using FACETS has demonstrated that use of the internet and other IT declines significantly with increasing age beyond 60 years, especially for accessing health care. In the context of the current COVID-19 crisis, the default use of IT for accessing health care is discussed as a barrier to care. Recommendations are made for increasing access to care, as well as increasing the use of FACETS to assess which media are most available to older adults for accessing health care.

Introduction

The quality of health care outcomes hinges on the quality of the communication between patients and health care providers [1, 2]. Over the last 20 years, Medicare and private insurers have made increasing use of information technology (IT) for communication with patients [3, 4, 5]. Increasing use of IT for patient contact has been mirrored by hospitals, regional health centers, university teaching hospitals, and local medical clinics [6, 7]. The trend toward the default use of IT for communication with patients has increased in the absence of data demonstrating that patient populations, especially older adults, have fluency with IT [8]. Although the Center for Medicare and Medicaid Services (CMS) tracks potential access to care issues including economic disparity [9], internet and IT fluency have not been addressed. Although internet and information technology (IT) utilization has increased among all demographic groups over the past thirty years, older adults continue to utilize the internet and IT at least 20% less than younger age cohorts [10-12], consistent with the findings of the U.S. Census Bureau and Bureau of Labor Statistics in 1990 [11, 13, 14] shown in Table 1.

Table 1: IT Access and Utilization by Age: Data from U.S. Census Bureau, 2016

	Age in Years	Access to home High speed internet	
	18-34	79.2%	
	35-44	83.2%	
	45-64	79.1%	
	65 and older	59.2%	

The U.S. Department of Health and Human Services [15] and the U.S. Census Bureau [16] estimate that by year 2060, the number of American adults over the age of 65 will more than double from 46.5 million today to over 98 million, potentially 25% of the population. The costs associated with an aging population are significant. Health care for people over the age of 65 is utilized at a significantly higher rate than that for younger age cohorts: 136% for Emergency Department admissions, 263% for inpatient discharges, and 241% for outpatient office visits [17]. Overall, health cares for people age 65 and older costs 167% as much as that for people age 64 and younger [18]. Data demonstrating disparities in IT utilization between demographic groups [10-12, 19-23] suggest that the use of IT for communicating with all patients creates a barrier to care for some patient populations. The potential consequence is that patient populations most in need of health care (including older adults) will find it most difficult to access [8]. Assessment of patient fluency with IT, or patient utilization of IT for the purpose of communication with health care providers and insurers, has largely been overlooked. Health care protocols for working with older adults have not included IT utilization as a specific area of assessment or treatment [24]. The American Psychological Association's (APA's) 21 Guidelines for psychologists working with older adults [25] do not include assessment and treatment of information technology barriers for older adults as a guideline [8]. To help determine patient IT fluency, the Functional Assessment of Currently Employed Technology Scale (FACETS) was specifically designed to assess frequency of IT utilization in various technical domains [26]. FACETS results can be evaluated across various independent variables, including age. Results of FACETS outcome research will be presented in this paper, followed by a discussion of their relevance in the context of the current COVID-19 health crisis, as well as general application for facilitating better communications with patients.

FACETS: Description, Use, Reliability and Validity:
The Functional Assessment of Currently Employed Technology Scale (FACETS, version 4.0, appendix 1) has been used to identify patterns of IT use by older adults for communicating with

health care providers, as well as accessing social contact, financial management, and other business functions [8]. FACETS is a 10-item questionnaire that can be completed in less than three minutes, which asks two questions in each of 5 functional domains: Home, Social, E-commerce, Health Care, and Technical. Each domain except the Technical domain assesses internet utilization. There are 6 optional answers for each question, measuring the respondent's use of specific types of information technology. Summing the scores for the two questions in each functional domain produces a subtotal score for that domain. The sum of all five domain subtotal scores produces an overall FACETS score. Higher FACETS scores indicate more frequent use of technologies across domains. FACETS have demonstrated high reliability and validity including Cronbach's alpha coefficient, mcdonald's omega, confidence intervals for alpha and omega, and multiple group factor analysis [27].

FACETS Research and Outcome Data:
In FACETS research, age has been a significant independent variable. For the purpose of exploring age differences in IT utilization, age cohorts were separated into groups. The youngest age group ranged from age 18 to 29. Subsequent age groups were determined by decade, e.g., 30 to 39, 40 to 49, and so on up to age 80 and over. FACETS age group cut points are indicated in Table 2.

Table 2: Age Group Cut Points

Group	Age in years
1	18 to 29
2	30 to 39
3	40 to 49
4	50 to 59
5	60 to 69
6	70 to 79
7	80 or older

FACETS outcome data indicate that with increasing age, older adults use IT less than younger age cohorts, especially for accessing health care. FACETS scores indicate that 95 – 98% of people under the age of 50 prefer to use IT to communicate with health care providers and insurers. Conversely, FACETS scores indicate that only 7% of people over the age of 70 and only

2% of people over the age of 80 do so (as indicated in Table 3).

Table 3: IT Utilization of Health Care by Age

Domain	Age under 29	Age 30 to 39	Age 40 to 49	Age 50 to 59	Age 60 to 69	Age 70 to 79	Age over 80
Health Care	95	98	95	68	40	7	2

In other words, 95.5% of adults over the age of 70 do not use IT for communicating with health care providers or insurers. The decline in the use of IT for accessing health care beyond the age of 70 is more dramatically apparent when viewed graphically. The decline in the use of IT for accessing health care with increasing age is indicated in Figure 1.

Figure 1: Frequency of IT Use for Accessing Health Care by Age Group
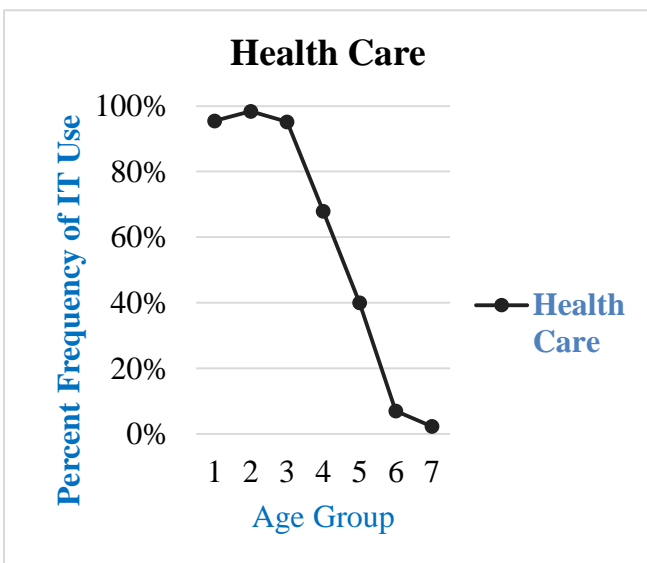
COVID-19, CMS, IT and Access to Care:
In the context of COVID-19, older adults belong to the cohort most at risk for serious and potentially fatal reactions to COVID-19. Along with people who have serious underlying health conditions, the Center for Disease Control and Prevention (CDC) most strongly recommends shelter in place for older adults. The CDC encourages people over age 65 not to leave their homes to purchase groceries or perform other routine tasks, but only to leave their homes in the case of a physical emergency [28]. Between February and April of 2020, in response to shelter

in place measures intended to reduce exposure to COVID-19, CMS made several policy changes intended to make telehealth more accessible to older adults. The changes included the decision not to enforce policies limiting patient location to approved rural facilities, and requiring HIPAA compliance for audio-visual platforms used for telehealth communications [29, 30]. The changes have increased access to care for Medicare subscribers with IT fluency. However, those changes did not address access to care for Medicare subscribers who lack IT fluency. As the FACETS data demonstrate, 95.5% of people over the age of 70 lack IT fluency. More specifically, 95.5% of Medicare subscribers over the age of 70 do not use the internet to communicate with health care providers. Instead, they rely entirely on face-to-face or telephone contact for communication with health care providers [8]. On April 30, 2020, in response to appeals from the American Psychological Association, CMS/Medicare announced that it will reimburse telephonic routine care delivery, including physician visits and psychotherapy [31]. This important change in Medicare policy makes health care accessible to 95.5% of Medicare subscribers over the age of 70.

Discussion and Conclusions:
The COVID-19 health crisis and shelter in place provided an alarming demonstration of the blind spot in health care regarding assessment of patient utilization of IT for the purpose of communicating with health care providers and insurers. The CDC's admonition to the public to utilize virtual communications for access to health care provides a viable alternative for younger age cohorts. However, FACETS research data demonstrate that older adults make very limited use of, and/or have very limited access to, IT for the purpose communicating with health care providers. While the discrepancy in internet and IT use between younger age cohorts and people aged over 65 is generally about 20% [10-12], mean utilization of IT (internet, web-based interaction) for access to health care by people over the age of 70 is only about 4.5% [8]. In other words, during shelter in place, 95.5% of people over the age of 70 rely exclusively on telephonic contact for access to health care. This finding is of special concern because older adults belong to the cohort most at risk for serious illness reactions to COVID-19 [28]. CMS's decision to reimburse telephonic

psychotherapy is an important acknowledgement of the potential barriers to health care IT represents for older adults. FACETS are a valid and reliable instrument for assessing which media people use for accessing health care [27]. Instruments like FACETS can be employed in order to determine the most effective means through which patients can access health care. Such assessment is especially important for older adults and other populations with limited IT fluency and/or access to IT or high-speed internet. Although the duration of shelter in place and the future trajectory of COVID-19 remain uncertain, the data suggest that substantial and permanent CMS policy changes allowing reimbursement for telephonic access to health care for older adults will be increasingly important in the near future.

Declarations

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Appendix 1:

Functional Assessment of Currently Employed Technology Scale (FACETS)

Age: _____ ◯Male/◯ Female ◯Hispanic ◯African American ◯Asian ◯Other
Household Income: ◯< $25,000 ◯< $50,000 ◯< $100,000 ◯< $150,000 ◯>$150,000
Degree: ◯N/A ◯High School ◯some college ◯AA ◯Bachelor's ◯Post graduate

A.	Home Domain						
1.	I send email...	◯ Never	◯ A few times a year	◯ A few times a month	◯ Once a week	◯ A few times a week	◯ Daily
2.	I find, open & close files in my computer...	◯ Never	◯ A few times a year	◯ A few times a month	◯ Once a week	◯ A few times a week	◯ Daily
	Home Domain Subtotal						
B.	Social Domain						
3.	I send text messages using a smart phone…	◯ Never	◯ A few times a year	◯ A few times a month	◯ Once a week	◯ A few times a week	◯ Daily
4.	I post on social media (e.g., facebook, twitter)…	◯ Never	◯ A few times a year	◯ A few times a month	◯ Once a week	◯ A few times a week	◯ Daily
	Social Domain Subtotal						

C.	E-Commerce Domain						
5.	I manage my banking and credit card	○	○	○	○	○	○
		I	it didn't work	but didn't help	help	but prefer not to	Prefer to
6.	I pay bills and make purchases via the internet…	○ Never	○ Tried, but it didn't work	○ Got help but didn't work	○ Only with help	○ Can but prefer not to	○ Prefer to
	E-Commerce Domain Subtotal						
D.	Health Care Domain						
7.	I communicate with my doctor or clinic online…	○ Never	○ Tried, but it didn't work	○ Got help but didn't work	○ Only with help	○ Can but prefer not to	○ Prefer to
8.	I communicate with my health insurance company online…	○ Never	○ Tried, but it didn't work	○ Got help but didn't work	○ Only with help	○ Can but prefer not to	○ Prefer to
	Health Care Domain Subtotal						
E.	Technical Domain						
9.	I have installed components (monitors, speakers, mice)…	○ Never	○ Tried, but it didn't work	○ Got help but didn't work	○ Only with help	○ Myself, with difficulty	○ Myself easily
10.	I have reset a modem or router in my home…	○ Never	○ Tried, but it didn't work	○ Got help but didn't work	○ Only with help	○ Myself, with difficulty	○ Myself easily
	Technical Domain Subtotal						
	Total FACETS Score						

Instructions: Check the response that most accurately completes each statement.

Access to a computer at home? ○ Yes/ ○ No   **Access to internet at home?** ○ Yes/ ○ No

Functional Assessment of Currently Employed Technology Scale (FACETS):

Purpose of Use:
Technology has grown rapidly over the last three decades, insinuating itself into almost every aspect of daily life. The ability to understand and interact with digital technologies is fast becoming necessary for functioning in multiple everyday contexts. The Functional Assessment of Currently Employed Technology Scale (FACETS) was developed to provide a quick, structured assessment of how frequently the respondent employs various information technologies. FACETS are not intended as a comprehensive assessment of technological proficiency. FACETS is intended as a brief clinical instrument that provides a general sense of the extent to which the respondent employs commonly used current technologies, and suggests which of those technologies are available to the respondent as resources. FACETS can be completed and scored in a few minutes, and in a clinical context can be used as part of an initial intake evaluation.

Administration and Scoring Guidelines:
The questions are given to the respondent on paper on a clipboard, or on a computer screen for self-administration, or can be read aloud to the respondent either in person or over the phone. If the respondent has a physical limitation, an informant may be employed to assist in administration. FACETS ask 10 questions, representing 5 functional domains: Home, Social, E-commerce, Health Care, and Technical. Each question has 6 optional answers that characterize how frequently the respondent employs a specific type of information technology. Scoring is assigned as follows:

Response	Score
Never	0
A few times a year/Tried, but it didn't work	1
A few times a month/Got help but didn't work	2
Once a week/only with help	3
A few times a week/Myself, with difficulty/Can but prefer not to	4
Daily/Myself easily/Prefer to	5

The scores for the two questions in each functional domain are added to produce a subtotal for that domain.

Each domain is scored on a continuous scale from 0 – 10. Higher scores suggest greater frequency using the information technologies in that domain. FACETS domain subtotal scores differentiate with the following cut-points:

- Very Infrequent IT Use 0 – 2
- Infrequent IT Use   3 – 4
- Moderate IT Use   5 – 6
- Frequent IT Use   7 – 8
- Very Frequent IT Use   9 – 10

FACETS domain subtotal scores provide a functional assessment of the respondent's relationship with specific technologies.

The five domain subtotal scores are then added to produce an overall total score.

A. Home Domain Subtotal (Questions 1, 2)	
B. Social Domain Subtotal (Questions 3, 4)	
C. E-commerce Domain Subtotal (Questions 5, 6)	
D. Health Care Domain Subtotal (Questions 7, 8)	
E. Technical Domain Subtotal (Questions 9, 10)	
TOTAL FACETS SCORE	

Total FACETS scores range on a continuous scale from 0 – 50. Higher scores suggest greater frequency using information technologies across domains. FACETS total scores differentiate with the following cut-points:

- Very Infrequent IT Use   0 – 14

- Infrequent IT Use   15 – 24
- Moderate IT Use   25 – 34
- Frequent IT Use   35 – 44
- Very Frequent IT Use   45 – 50

Total FACETS scores provide a functional assessment of the respondent's relationship with technologies across domains.

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