ORIGINAL RESEARCH

Refugee smartphone access to health care in Canada: Concept analysis

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ABSTRACT

Objective: With the ever-changing smartphone healthcare technology also comes nurses' responsibilities to recognize its ethical implications particularly among vulnerable population. The aim of this paper is to explore what we know about the use of smartphone to access health care among refugees and new immigrants.

Methods: We were guided by Walker and Avant (2011) concept analysis methodology. Concept analysis is a rigorous method to better understand ethical implications, meaning, attributes, antecedents and consequences of smartphone access to health care. Diverse databases were included such as CINAHL, Journals@Ovid, ProQuest Nursing & Allied Health Source, ProQuest Psychology Journals, PsychINFO, ERIC, and Education Full Text.

Results: The concept analysis retrieved 23 studies. Overarching themes included the physical (e.g. income, geographical location) and social (generation; access to regular internet; digital literacy; relationship with practitioners) that were attributed to refugee and new immigrant access to health care.

Conclusions: Some of the ethical implication when using smartphone to access health care technology with refugees and new immigrants are discussed and the skills needed for nursing practice are identified and recommendations for nurse education and research are made.

Key Words: Refugee, Smartphone, Health care, Ethical implication

1. INTRODUCTION

While the increased use of smartphone technology in nursing education and practice is inevitable, researchers, educators, and clinicians are asking how to raise awareness of its ethical implications. Smartphones are defined as palm pile (hand held) mobile phones with computer functional capability (e.g., can run software applications [apps] such as social media apps, email, video recording/conferencing/e-booking/e-counselling, e-health, m-health, websites and monitoring technology). In some cases, an app can even be used without internet connectivity. According to Statistics Canada (2017), 94% of 15 to 34 years old surveyed reported owning a smart-

phone, 77% reported that smartphone technology helped them to communicate with others, 66% said it saved time, 52% said it helped to make more informed decisions, and 36% felt that it helped them be more creative.[1] Although it is beyond the scope of this paper to review all available smartphone education and health care practice app some key nursing examples include the Personal Digital Assistants (PDA) were early versions of smartphone that allowed practitioners to handle point of care resources.[2] Drug resources apps (e.g., Epocrates) were the type most often listed as essential for nurse practitioners.[3] There are also interdiscipline communication apps,[4] wound care resources,[5] and translation

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and patients monitoring technology.[6,7] Challenges of using smartphones apps in nursing practice and education include technical difficulties, a source of infection, and an distraction to nurses at work and school.[8–12] However, little has been written about how to recognize and measure smartphone use and the ethical implications when smartphone app technology is developed and used with vulnerable populations in health care.

Our overall goal is not to argue for or against the use of smartphone app technology but to highlight the ethical implications for nursing clinicians and educators when working with students, clients and their family. The Office of the United Nations High Commissioner for Refugees reported that in 2017 Canada has admitted the largest number of refugees in a single year in nearly four decades.[13] The value of the smartphone was highlighted when Wind Mobile provided refugees arriving to Toronto with free mobile phones and basic mobile services for 24 months.[14] Smartphone technology permeates many aspects of the Canada's health care system to support access to health care services for refugees, new immigrants, and populations living in remote community and populations needing translation services.[6,15,16] While health related apps promise easy access to health information and services, it becomes paramount to help nursing student ask how and if smartphone really facilitates and accommodate access to health care services for vulnerable population. Increasing nursing clinical and community placements provide opportunities for nursing students to care for refugees and new immigrants with the help of smartphone technology. Yet there are limited studies exploring refugees and new immigrants perspectives on using their smartphones to access health care. In collaborating with faculty, clinician and nursing students we wanted to know what we know about smartphone access to health care for refugees and new immigrants.

Despite increased use of smartphone technology in health care several refugees and new immigrants demographic characteristics points to the lack of access to health care. Women and girls made up 49.6% of the refugees and most were in the caregiving roles.[17,22] Although the majority of refugees have been living in Quebec (21.4%) and Ontario (43.7%), others have been settling in urban areas. Statistic Canada (2016) reported that 38% of all immigrant women and 49.6% of recent immigrant women between the age of 25 and 64 had a bachelor's level education or above as compared to 26.6% of Canadian born women with the same level of education.[17] Despite being more likely to hold a bachelor's level degree or higher, immigrant women were more likely to be unemployed than their Canadian-born counterparts. Of the immigrant women that were employed, 60.1% found employment

in positions that did not match their education level.[18] In 2016, Immigration, Refugee, and Citizenship Canada (IRCC) examined the Syrian refugees who were admitted to Canada between November 4, 2015 and March 1, 2016. Their survey found that half (52.8%) of the privately-sponsored refugees (PSRs) had found employment as compared to 10% who were government-assisted refugees (GARs). Of those who reported having a job, the most common form of employment for both GARs and PSRs were in the Sales and Service occupations (e.g., cashier, restaurant worker, grocery store staff, kitchen helper, cleaner, customer service worker, cook). The second highest occupation field was Trades and Transport occupation (e.g., construction, carpenter, technicians, welder).[19] A report on the income of immigrants in Canada from 2015 show that the mean annual income of immigrants born in the regions of Africa and the Middle East ($49,000/yr), Asia ($25,000/yr) and Southern/Central America ($27,000/yr) were much lower than those of immigrants from Europe and the United States ($49,000 and $74,000 per year, respectively).[1] In Rezazadeh and Hoover (2018) systematic literature review on immigrants women experiences to Canada, they reported that refugee women working in physically laboured job (e.g., house cleaning, factory) preferred attending their job as a priority over keeping a doctor appointment.[20] Similarly, refugees and new immigrants were hesitant and reluctant to ask for a sick leave from their managers to attend a medical follow-up appointment.[21] Visible minority refugees and new immigrant women overall health was worse than the Canadian-born women.[22] Khan, Yao, and Shah (2017) conducted a population-based cohort study using health care databases in Ontario and found that women refugees were 23% more likely to develop type 2 diabetes after childbirth and their babies were less likely to go to well-baby clinic between 45 and 75 days of age for the first routine vaccination.[21] Refugees also often experience physical, mental, and psychological traumas.[23] The Healthy Immigrant Effect is a phenomenon indicating that immigrants' health is generally better than Canadian-born but tend to decline over the years of their residence.[18,22,24,25] This effect on post-migration health can be influenced by diverse factors such as unfamiliarity with the Canadian health care system and lack of access to technology that may directly or indirectly influence health.[20,24–26]

The purpose of this paper is to conduct a concept analysis of the concept smartphone access to health care guided by Walker and Avant's method.[27] In particularly, for both research and nursing education purposes, faculty and nursing students in an undergraduate program collaborated to explore the key attributes and the ethical implications of using smartphone to access health care among refugees and new

immigrants.

2. METHOD

We will be guided by the concept analysis methodology to better communicate meanings, understandings, and ethical attributes of the concept "smartphone access to health care".[27] Walker and Avant (2011) invited us to be specific (e.g., with whom and who the concept is used) when using a concept analysis methodology.[27] A concept analysis includes the deconstruction of a concept and then the rebuilding of the components into a coherent whole.[28] Concept analysis has been used in nursing to better conceptualizing and operationalizing a concept for research and clinical purposes as well as to better help nursing students understand the key ethical attributes of a concept and how the concept plays out in a case study.[29] For example, Walker and Avant (2011) has dominated the guidance of conducting a concept analysis and in the latter stages the process helps developing model cases, borderline cases, and contrary cases that can guide the teaching, learning and researching of the concept attributes.[27] Thus, we will be guided by Walker and Avant's rigorous 8 steps of a concept analysis method.[27]

2.1 Steps 1 and 2: Decide on a concept and justify purpose

We choose the concept: Smartphone access to health care. In particular, we want to explore what we know about the concept in relation to vulnerable population such as refugees and new immigrants to improve communication and understanding of the concepts ethical implication.

2.2 Step 3: Identify uses of the concept: Literature review

The third step identifies the nature of the concept by reviewing the literature.[28] Definitions of both smartphone and access to health care were sought from dictionaries and published literature in the field of nursing, psychology, medicine, and information technology. We used diverse databases including CINAHL, Journals@Ovid, ProQuest Nursing & Allied Health Source, ProQuest Psychology Journals, Psych-INFO, ERIC, and Education Full Text. Search terms included "smartphone", "nursing", "health care access", "access", "refugees and new immigrants", and "education" in various combinations. Articles included in the analysis are both research, anecdotal reports, and theoretical manuscripts while dissertations and conference abstracts were excluded. A final yield of 23 articles were extracted.

The World Health Organization (WHO) view access to health care as the opportunity to allow a person to obtain health services they need and benefit from without financial hard-

ships.[30] The etymology of the term access emerges from Latin accessus meaning "a coming to, a way of approach, an entrance".[31] Access to health care is one of the five pillars of the Canada Health Act as it states that all insured persons have reasonable access to health care facilities and insured services without paying or being charged a user fee.[32] However, the health care system in Canada only provides access to basic medical coverage whereas extended health plans such as prescription medications, dental care, physiotherapy, ambulance services, and prescription eyeglasses are not covered by the government and thus requires extra health insurance.[33] Furthermore, the Interim Federal Health Program (IFHP) policy came into effect on August 31, 2016 and further stipulated the limited (e.g., starts 3 months after stay) access to the Canadian health care benefits to resettled refugees, refugee claimants, rejected refugee claimants and certain others who are not eligible for provincial or territorial health insurance.[34] Lum, Swartz, and Kwan (2016) found that some of these three months delays in receiving health care limited refugees and new immigrants to seek help altogether and thus decreasing their health outcomes.[35] Another example of the ambiguity in access relates to physical accessibility (e.g., geographical, residential, and financial). While physical accessibility is a key dimension of the Canadian Health Care Act and the WHO definition of access, individuals living in remote (e.g., urban) area have limited access to health care.[36] Levesque et al. (2013) conducted a concept analysis on access to health care and argued that it was difficult to accurately measure access as access to health care affected people in different and sometimes silent ways.[36] Thus, they wanted to further explore the specific circumstances of the determinants of access that pertained to a group of individuals. They explained "We view access to health care services as resulting from the interaction of individual characteristics (e.g., the place where they live, their economic resources, and their social status) and of services (e.g., quantity, location of facilities, and costs)."[36] Similarly, Norris and Aiken (2006) in their analysis of the concept personal access to health care argued that although several authors wrote about access to health care, these authors tended to underscore specific demographic variables which had an effect on access rather than access itself.[37] Examples of such variables are rural, urban, race, nationality, gender, health status, knowledge level, culture, and cost.[37] Thus, in this paper we will focus on what we know about refugee and new immigrants use of "smartphone access to health care", which addresses the call to focus on particular vulnerable population (e.g., refugee and new immigrants) with particular dimension of access (e.g., smartphone technology) to health care.

With the increasing number of refugees arriving to Canada in 2017 as compared to the previous four decades, supporting their access to health care and understanding their experiences becomes paramount.[13] Agrawal and Zeitouny (2017) found that majority of the refugees in Alberta owned a smartphone and use it mainly to communicate with English-speaking Canadians such as their children's teachers, doctors, and grocery clerks through the help of various translation applications.[38] While smartphone integration in health care and nursing education increases the mobile app market particularly the health-monitoring technology (e.g., vital signs; movement behaviour; palpation teaching) is becoming progressively smart thanks to the interpretative softwares applied to the data that are collected from the users.[7, 39] Currently, whether a mobile health-monitoring app on a smartphone is a regulated medical device is debatable. The upregulation of medical app devices plays out by how Health Canada encourages manufacturers to reference the U.S. Food and Drug Administration (FDA) technical guidance documents on topics in which no similar Health Canada guidance is available.[40]

2.2.1 Digital divide

There is an increase in the number of refugees and new immigrants who own a smartphone.[38] However owning a smartphone and having a smartphone internet access to health care resources and services are two different concepts. To have an access to health care one must also have some level of digital literacy. Digital literacy refers to an individual's ability to navigate and produce clear information through writing and other forms of communication on various digital platforms such as social media sites, blog sites, smartphone apps, tablets, laptops, and desktop PCs.[41] A digital divide occurs when there is a gap between the so-called internet user and non user.[42] Health literacy is another key concept associated with smartphone access to health care for refugees and new immigrants and the digital divide. The Patient Protection and Affordable Care Act of 2010, Title V, defines health literacy as the degree to which an individual has the capacity to obtain, communicate, process, and understand basic health information and services to make appropriate health decisions.[43] Wieland et al. (2017) conducted a cross-sectional study with refugees and new immigrant (Latino n = 15; Somalia n = 10) to assess knowledge and needs on type 2 diabetes.[44] They used a narrative-based videos (available with smartphone internet) as a 'digital storytelling intervention' at their clinic to translate health information. Their results showed a change of -0.8% (-10 mmol/mol) ($p = .02$) in baseline A1C values for participants after using the narrative based video instruction with the language congruent to participants. Participants reported that when the videos

instruction was congruent to their mother tongue language they paid more attention, were more interested to learn, more confident (96%), more motivated (92%), and applied better the health information (p. 353).[44] Similarly, Njeru et al. (2015) used a diabetic digital story as a way for refugees and new immigrants to tell their experiences with diabetic using digital photo.[45] This was a way to overcome language barriers. Authors did not discuss access to internet as barrier.

The lack of knowledge and understanding on how to navigate the healthcare system can be part of health literacy and create further digital divide among refugees and new immigrants.[20, 46] For example, Stewart et al. (2017) reported that refugees and new immigrants who want to access support services as new parents were unable to because they felt confused of which agencies could support them and some were unaware of online resources.[46] Giving refugees and new immigrants printed brochures and pamphlets about services were not sufficient to support their access to the services due to language, communication and cultural differences. Similarly, Robinson and Bartlett (2018) describe their partnership between a public library and health care professionals to support language and culture barriers of health care to refugees and new immigrant.[47] Refuges preferred health information in their language that's available online compared to written materials. In Canada, English and French are the official languages in health care goods and services. Oda et al. (2017) conducted a cross-sectional study using an interview design and revealed that the current dominating languages of refugees and immigrants arriving to Canada includes Arabic (59.5%), Armenian (29.0%), and only a small number of them spoke English (8%) yet most health related websites informations and services were offered in English or French.[24] Refugees and new immigrants had high preference to speaking their own languages when trying to access health care services.[21] Similarly, Stewart et al. (2017) reported that refugees and new immigrants felt ignored when they were not able to speak for themselves and look for relevant health information when seeking health care services (p. 242).[46] In some cases, translation services were not available to assist with communication with the health care team and complete health forms. For example, a Sudanese mother stated that she signed about 98% of documents in doctors' offices or in the hospitals without proper understanding of what it about and if there was legal complications (p. 1151).[48] Author suggested to support clients on how technology can be further used.

2.2.2 Generation gap

How we provide health information and which groups of people do not have access to health information link to smartphone access to health care. Wong, Harrison, Britt, and

Henderson (2014) pointed out that in Australia, the proportion of Internet users and online health information seekers decreased with age as only half of all patients aged 65-74 years used the Internet, one in five (21.2%) of these patients looked up health information online, and one in ten (10.5%) of them successful obtained information about a particular health problem.[49] In addition, in the 75 years or older group, only one-quarter of them used the Internet in the previous month.[49] Similarly, Nguyen, Mosadeghi, and Almario (2017) focused on the generation differences where the oldest age (66 to 85 years) were less likely to seek health information on the internet compared to those in the 18-50 and the 51-65 years age groups (58.3% vs. 64.5% and 67.1% respectively) (p. 53).[50] Although many older refugees and new immigrants had a smartphone, many prefered face-to-face interactions with their caregivers. For example, Schulz et al. (2015) reported that while 82% preferred the visual aspect of the video conferencing, only 16% perceived video conference as better in comparison to face-to-face whereas 24% considered it was worse.[16] This generation differences in access to digital were further characterized by Marc Prensky as digital native (individual born into the digital age) and digital immigrant (individual who adopts technology later in life). Haluza, Naszay, Stockinger, and Jungwirth (2017) built on Prensky research and argued that being a digital native did not make one more digitally literate.[51] Thus, exploring individual's life perspectives and health and smartphone access experiences and barriers are paramount to understanding their smartphone access to health care. Several authors described how power dynamic roles within a family rather than family members age groups affect who is using and owning their smartphone and have access to health information.[52–54] In Ahmed et al. (2017), women refugees spoke about husbands as a barrier for them owning a smartphone.[52] Furthermore, Kam and Lazarevic (2014) described the experiences of Latino immigrants' children acting as "language brokers" to their family (p. 1995).[55] These children were assumed to be digital natives but they could only facilitate access to Internet health services some of the time.[55] Similarly, an Australian study on older immigrants and refugees suffering from liver cancer identified a lack of familiarity with the English language as a key barrier to using and finding health services.[56] Some non-English speaking refugees told the researchers that they did not know about the existence of the online and telephone interpreting service and that their children can not always accurately translate the English medical jargons properly despite being able to speak fluent English and knowing how to use the Internet.[56]

Haluza et al. (2017) carried out a cross-sectional study (n = 562) in Austria looking at differences between age groups regarding the health information-seeking behaviours and the use of the Internet in acquiring information among other sources.[51] Most participants in this sample used the Internet as a health information source (total = 78.5%). Almost all participants used their smartphone (95%) with higher usage among digital natives ($p < .001$). However, contrary to what the authors expected, digital natives were more likely to refer to family and friends as sources for health information whereas digital immigrants were more likely to use sources such as newspapers and television/radio ($p < .05$). Compared to digital immigrants, digital natives were more likely to have higher health information-seeking scores ($p < .013$) and were also more likely to report searching for specific medical information such as medical terms, own health status or disease, and diets/weight reduction program ($p < .05$). Similarly, Tsetsi and Rains (2017) surveyed marginalized populations (n = 2,254, mean age = 52.4 years, SD = 19.4) and showed that marginalized population (e.g., low income refugees, youth, and less educated) used smartphones for more social activities (e.g., connecting with family and friends) and less for seeking health informations and resources unless they were supported.[42]

2.2.3 Access to Internet: Participatory gap

Nguyen et al. (2017) studied the prevalence and predictors of access to the Internet with vulnerable population (n = 24,000) including refugees and new immigrants in their sample.[50] They reported that older individuals, immigrants, non-English speakers, and those who lived in low income households and in rural areas were less likely to have accessed the Internet (p. 50). Many refugees and new immigrants were already in financially unstable circumstances which further restricted their access to the Internet and health care services.[26, 36]

Irregular access to the Internet creates a participatory gap which includes an important ethical implication.[57, 58] Refugees and new immigrants can be taught how to use their smartphones to communicate with health care providers. However, if they only have access to the Internet in the doctor office and do not have access at their home, they cannot further develop and practice how to communicate using their smartphones. Thus, it puts the refugees and new immigrants at a disadvantage. Jang et al. (2014) conducted a pilot study with older Korean immigrants (n = 14) who resided in Orlando, Florida and utilized the mental health support using synchronized video conferencing in the comfort of their home or a meeting room at a facility.[59] Four Korean mental health counselors who were based in New York met the new immigrants for four weekly sessions. While the participants' post depressive symptoms decreased significantly ($t = 13.1$, $p < .001$), 10% of participants did not have regular

access to the Internet at their home to fully participate.[59] Nguyen et al. (2017) reported the disparities in access to Internet use among racial/ethnic groups compared to the white population. African Americans, Latinos, Japanese, Chinese, Filipinos and South Asians were all less likely to have used the Internet or have regular access.[50] Although the Internet is now widely used in most homes, some households (21%) are estimated to have no regular Internet access at home or elsewhere.[42]

2.2.4 *Relationship with caregivers*

Relationship between practitioners and refugees and new immigrants were paramount to the willingness to use smartphone to access health information. Rashawn, Sewell, Gilbert and Roberts (2017) used data from the Health Information National Trends Survey (HINTS) to examine racial differences in obtaining health information online via mobile devices.[60] They concluded that in the U.S., blacks and Latinos (including refugees and new immigrants) were more likely to trust online newspapers to get health information than whites. Minorities who have access to a mobile device are more likely to rely on the Internet for health information in a time of strong need. Similarly, when refugees and new immigrants perceived their health experiences as stigmatizing it affected how they access the digital health care services. For example, when refugees were experiencing mental illness (e.g., depression, post traumatic stress) they avoided seeking face-to-face health services in traditional health care places.[20, 36] Ballard-Kang, Lawson, and Evans (2017) explored 563 refugees' health seeking behavior in Kentucky, U.S.[61] They reported that Cuban, South/Southeast Asian, and African refugees who screened positive for 'emotional distress'(e.g., post-traumatic stress disorder [PTSD], anxiety, and depression) on the RHS -15 scale (Refugee Health-Screener - 15) were less likely to accept referrals for mental health services from either a health care provider in a clinic or mental health coordinators from refugee outreach programs. Similarly, Drummond, Mizan, and Brocx (2016) studied Liberia and Sierra Leone refugees woman arriving to Australia (n = 51) and compared them to non-refugee women's health seeking behaviours.[62] They found that stigma related to chronic and mental illnesses acted as a key barrier leading to the avoidance of health care services (p. 215).[62] More than half of the refugee women in the study also reported a fear of being judged by their family, friends and the health care provider (55%).[62] In particularly, privacy concerns were identified as a major barrier to accepting and seeking health services (p. 7).[52]

When refugees and new immigrants did not seek health care to support their mental health they explained that they could self-treat or seek support from their communities,

particularly family or friends (46%) instead of health care providers ($p < .001$).[52, 61, 62] Others sought support from different communities as they did not always trust health care providers to maintain their privacy.[20, 52] Similarly, Rezazadeh and Hoover (2018) systematic literature review found that refugee women preferred to be consulted by physicians outside their ethnic communities regardless of their language barriers.[20] Ferrari, Ahmad, Shakya, Ledwos, and McKenzie (2016) conducted a randomized controlled trial (RCT) in Ontario, Canada with refugees and new immigrants to evaluate the acceptability of an Interactive Computer-Assisted Client Assessment touch-screen Survey (iCCAS) to make mental health services more accessible to clients and begin the process of addressing possible symptoms or issues of mental illnesses.[63] Ferrari et al. (2016) reported that participants (n = 74, mean age = 36.6 years) had positive attitudes towards iCCAS.[63] On a scale of 1 to 5 on the perceived Privacy-Barriers scale, participants were found to be 'not sure' about the confidentiality of the information collected through the survey (mean = 2.63) (p. 5).[63] Similarly, Flynn and Flynn (2008) studied Somali refugees and new immigrants on their perspectives and barriers accessing e-health services.[64] They concluded that if the relationship with their main primary care health providers was not working well, eHealth may provide the Somali refugee community with a complementary route for obtaining health care information that they could trust. At the present, however, a range of factors, including problems of inter-culture communication, are preventing the Somali community from accessing the public health services to which they are entitled.

2.3 Step 4: Determine the Defining Attributes

Many attributes critical to the understanding of smartphone access to health care were identified in the literature. They were categorized into two subgroups:

2.3.1 *Physical and economic determinants*

Low income, geographical location, and education level were important in understanding smartphone access to health care. In particular, less educated, and lower-income individuals were less likely to own a telephone or computer in their homes or have regular access to the Internet. While most refugees arriving to Canada live in large cities (Toronto and Montreal), over 35% reside in rural areas and as a result have to commute more to areas that have regular consistent Internet. Henry Jenkins coined the term participation gap to describes the gap in skills that emerge when individuals have different levels of access to technology.[65] For example, individual learn different sets of technology skills if they only have access to the Internet in a library, school, or work. Individuals who have regular access to the Internet at home have

more opportunities to develop their skills and have fewer limitations such as computer time limits and website filters commonly used in libraries. In a study conducted by the United Nations High Commissioners for Refugees, 10% of the total refugee population do not have mobile coverage with Internet connectivity as compared to 5% of total global population.[66] The majority of the refugees who lack Internet coverage reside in rural areas. Twenty percent of rural refugees have no network access, whereas only 10% of the global rural population have no coverage.[66] Danah Boyd observed privileged and disadvantaged teens' different experiences with technology.[67] In New York, she observed a teen girl use her Android phone for texting and using mobile applications.[67] The teen girl was able to use technology to participate in social media, but the Internet was too slow on her phone to complete homework assignments. Although the teen girl had full access to the Internet, the slow Internet and mobile device itself limited her experience in further improving her competence with technology. The teen girl's limited access to technology highlights the participatory gap in skills that individuals experience when they have limited access to the Internet and various modes of technology.

2.3.2 *Social determinants of accessibility*

The generation gap: Function use of technology

White highlighted the concept digital visitors and residents in terms of people's online engagement.[68] Visitors leave no online social trace and see the Web as a set of tools whereas residents live a portion of their lives online and see the Web as a network to expand their connections.[69] These are not two separate categories of people, but rather a description of a continuum of behaviors.[70] It is probable that many individuals demonstrate both visitor and residential behaviours in different contexts. The differences between the digital resident and digital visitor do not depend significantly on the individual's age or generation but rather depend on the individual's functional use of the technology.[70] For instance, the digital visitor would have a passive presence on social networks and might be more dependent on others whereas the digital resident would have significant online presence with high level of digital collaborative activity.[70]

Relationship gap: Patient satisfaction

When refugees perceive the need for health services and have access to smartphone increased its use.[60] When refugees and new immigrants perceived their health experiences as being stigmatized by their caregivers and practitioners (e.g., when they experience depression, post traumatic stress, or anxiety), they prefer not to seek face-to-face professional help but use their smartphone more to maintain their privacy and confidentiality.[63, 64] Furthermore, when refugees and

new immigrants trusted the cultural sensitive care of their health care providers and had ongoing support in the education they received they were more satisfied and willing to use smartphone to access care.[60] We describe these type of patient perceptions as patients satisfaction with education information knowledge and patient satisfaction when engaging with healthcare provider as determined by using a scale responses to questions aimed at eliciting patient view on specific aspect of patient education when using their smartphone activities.

2.4 Steps 5 and 6: Construct a model, borderline, and contrary case

To further understand the concept, smartphone access to health care, among refugees and new immigrants, we have developed cases that contain 1) physical and economic; 2) social attributes, some or none of the proposed defining attributes. These steps allow for judgments to be made concerning the congruence of the attributes to the concept.

2.4.1 *Model case*

A model case incorporates all the defining attributes of access: physical and economic (internet services and living in far away communities) and social (generation gap and patient-practitioner relationships).

Mrs. Jonda arrived to Canada with her two teenagers daughters a year ago and reside in a Downtown Toronto. Mrs. Jonda has been experiencing severe headaches, shortness of breath and nose bleed when returning home from a night shift. Mrs Jonda 17 year old daughter decided to called 911 and accompany her mother to the ambulance to help with some translation. At the hospital the nurse explained to Mrs Jonda daughter that their mother suffers from high blood pressure. High blood pressure can be life threatening if not treated and monitored regularly. The nurse explained that monitoring blood pressure in the morning provides more accurate readings. Mrs Jonda explained to the doctor that she cannot skip work and go to a doctor clinic every morning just to monitor her blood pressure. Mrs Jonda suggested if she can purchase at home blood pressure machine she said "I have coverage from work that covers the blood pressure machine". The nurse thought this was an amazing idea and suggested that there are some app that can keep track of Mrs Jonda blood pressure morning reading. The app creates visual display of the blood pressure reading and communicate the information to their medical office. Mrs Jonda daughter said they just got a smartphone with internet data and she can help her mother upload the app at home. The nurse explained that there is 24 hrs online technical support that can show using video conferencing how to use the blood pressure machine and keep a log. Also, a nurse can meet with Mrs

Jonda for the first few weeks for support and guidance.

2.4.2 *Borderline case*

A borderline case is one, which contains some of the defining attributes but not all of them.

Joy recently arrived to Canada with her family and has been experiencing deep sadness, lack of sleep and appetite and difficulties getting out of bed. Joy does not want to burden her parents and decides to keep quiet about her experiences. Joy's family does not own a car and have been living in a town that is 5 hours drive away from the nearest medical clinic. Although joy has a smartphone, she has to walk 2 hours to the public library to access internet services so she can chat with her friends and family from back home. Joy does not read, write or speak English well but decides to connect to a confidential English speaking mental health e-counselling youth support that was advertised in her facebook account.

2.4.3 *Contrary case*

A contrary case is an example, which clearly does not illustrate the concept. Mrs. Devota arrived to Canada a year ago with her husband. Mrs Devota was found by her neighbour lying unconscious in her kitchen. The neighbour drove Mrs Devota to the nearby clinic. When they finally arrived to the clinic Mrs Devota refused treatments. This contrary case contains none of the defining attributes.

2.5 Step 7: Identify antecedent and consequences

Consequences are those events or conditions that occur as a result of the concept.[71] Appropriate utilization support of the smartphone, decreased disparity, and preventative health care have been identified as positive consequences of smartphone access to health care. An antecedent is an event, condition or situation that must occur prior to the occurrence of the concept.[71] In this analysis, a single antecedent has been identified, including owning a smartphone with regular internet access as well a patient must perceived that they have a health concern and that using their smartphone can help them address access health care services. It is essential for this factor to be present for utilization to ultimately occur. The perceived need may derive from symptoms or illness or from a desire to pursue preventative measures.

2.6 Step 8: Empirical referents on how to capture smartphone access to health care

The last stage in Walker and Avant's concept analysis method focus on identifying the empirical referents. Empirical referent are categories of the phenomena that by their presence will capture refugee or new immigrant smartphone access to healthcare.[27] The defining attributes of smartphone access

to healthcare are abstract so we need empirical referent to make the concept measurable. Thus we will describe 'smartphone access to healthcare' from within our definition of attributes including (a) Physical and economic and b) social determinants of accessibility which includes function use of technology and patients satisfaction.

The empirical referents used to measure patient physical and economic status include item about patients' socio-economic status and their physical geographic residence (e.g. living in rural areas) and their access to internet; Patients' owning a smartphone; Patients' physical ability to navigate and produce clear information through reading, writing and communicating on various digital platforms (e.g., social media sites, blog sites, smartphone apps, tablets, laptops, and desktop PC) in different time and place.

The empirical referents used to measure patient social determinants of accessibility status includes two parts. First is function use of technology[68–70] which can include items such as "How often do patient use their smartphone?"; "Who helps/support patient when using smartphone to access healthcare services?"; "What do patient use smartphone for?".

The second empirical referent used is patient satisfaction (patient reporting feeling of contentment) with service and education information knowledge gained when using smartphone to access healthcare.[72] The empirical referent for patient satisfaction includes item such as "Patient felt they could get the health information they needed using their smartphone at the right time and place" or "Patient understood the material and knowledge provided on the smartphone" or "nurses helped patient feel at ease using their smartphone" and "how comfortable/competent patients are when using smartphone to navigate health education information knowlege?".

3. DISCUSSION AND CONCLUSION

This paper was written in collaboration with clinician, faculty and nursing students to explore the concept of smartphone access to health care with refugees and new immigrants. While the use of smartphone technology in health care increase it is also influence nursing practice and education. Sagar and Pattanayak (2015) ascertain that the use of smartphone technology to support mental health will only increase and as such requires a closer look into its sometime silent ethical implications for not only clinicians and educators but also the public.[73] We used a concept analysis methodology by Walker and Avant (2011) to guide the teaching and learning of the concept smartphone access to health care attributes and highlighted its ethical implications among

refugees and new immigrants.[27] Majority of studies included in this analysis used qualitative designs and literature review[20, 26, 36, 45, 53] and used interviews (one-on-one and focus group)[24, 38, 44, 46, 47, 54, 56, 64] open-ended questionnaire and survey[16, 42, 49–52, 55, 59, 60, 63] as a dominating data collection to capture access and use of smartphone technology. While the use of smartphone technology such as navigating apps; creating video instructions is increasing there is a gap in what are effective ways to empirically capture these technologies effect on access to services such as health care and education. The concept analysis reveals empirical referents that can be used to develop tools to measure refugee and new immigrant smartphone access to healthcare. For example, understanding the physical (e.g. income, geographical location, language) and social (function use of technology and patients' satisfaction with practitioner relationship and services) attributes were highlighted.

The ethical implication this analysis revealed focused on the unequal access to smartphone technology. Refugees and new immigrants language barriers and the lack of knowledge and understanding of how to navigate the healthcare system created a digital divide; as some unaware of online health resources and support.[20, 46] Although older (e.g., 51-65) refugees and new immigrants had a smartphone they were less likely to seek health information on internet and preferred face to face interactions.[16, 50] Thus, having a smartphone not necessarily means can access health care instead exploring refugees and new immigrants perspectives on their health and smartphone access experiences and barriers are paramount to supporting access to health care. The ethics in smartphone access to health care also emerged in power differences between roles within the family.[52–54] Women refugees spoke about husbands as a barrier for them to owning a smartphone with internet access. Children spoke about some of the burden they experience as language brokers and helping their family navigate the internet.[55] Yet when refugees and new immigrants had access to smartphone technology and perceived their mental health experiences as stigmatized they were more satisfied and felt they can access and rely on the Internet to seek health information. They believed their smartphone access to health service is more confidential then speaking with a health care provider in their small community.[60] However, our analysis of the essential characteristics of smartphone access to healthcare was limited to refugee and new immigrant further studies need to explore other vulnerable population (e.g., individual who identify with a disability; practitioners and educator access and use of smartphone in healthcare). With the increase number of refugees and new immigrants arriving to Canada, more nursing students and nurses are caring for them and are asked to use smartphone app technology in their care. As mobile health-monitoring, video recording or health resources app on smartphone are not yet regulated medical device nurses, researchers and educators should pave the way to further study and capture smartphone access to healthcare.

CONFLICTS OF INTEREST DISCLOSURE
The authors declare that there is no conflict of interest.

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