"There's an App for That": An Interview with Dr. Jennifer Stinson, an M-Health Expert

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ABSTRACT

Increased adoption of smartphone technology by the general public has opened up an exciting new means by which healthcare professionals can interact with their patients [1]. The smartphone's unique ability to combine mobile communication and computation offers a novel modality by which physicians can deliver healthcare interventions to their patients. Thus, it is no wonder that the use of smartphones in healthcare settings (so called "m-health") has become the focus of widespread interest amongst healthcare professionals, with many smartphone-based medical applications already in widespread use amongst physicians and patients [2].

Leading the charge in this m-health revolution is Dr. Jennifer Stinson, a nurse clinician scientist based at The Hospital for Sick Children in Toronto, who aims to capitalize on the popularity of smartphones among adolescents [3]. Dr. Stinson is a pioneer in the field of m-health, creating one of the first electronic pain diaries using the Palm Tungsten PDA to help adolescents with juvenile idiopathic arthritis (JIA) related pain [4]. More recently, she has created the "Pain Squad" smartphone-based app, a multiple award-winning pain measurement tool for children and adolescents with cancer [5].

I was able to speak with Dr. Stinson about her experience with m-health, her views about the future of m-health, and her advice for interested healthcare professionals and trainees who want to integrate mobile technology into their own patient care. The following is an edited version of that conversation.

RÉSUMÉ

L'utilisation accrue de la technologie des téléphones intelligents par les membres du public a ouvert une toute nouvelle façon pour les professionnels de la santé d'interagir avec leurs patients [1]. La capacité unique du téléphone intelligent de combiner la communication sans fil et l'informatique offre aux médecins un nouveau modèle pour fournir de services de santé à leurs patients. Il n'est donc pas surprenant que l'utilisation des téléphones intelligents dans le milieu de la santé (connu sous le nom de santé mobile ou m-santé) soit devenue le point central d'un intérêt toujours grandissant chez les professionnels de la santé. De nombreuses nouvelles applications médicales pour téléphones intelligents sont de plus en plus utilisées par les patients et les médecins [2].

Mme Jennifer Stinson, une infirmière clinicienne-chercheuse au Hospital for Sick Children de Toronto, mène la marche dans la révolution de la santé mobile. Elle cherche à tirer profit de l'engouement des adolescents et adolescentes pour les téléphones intelligents [3]. Madame Stinson fait figure de pionnière dans le domaine de la santé mobile, ayant créé le premier journal électronique de la douleur en utilisant l'assistant numérique personnel (ANP) Palm Tungsten afin de venir en aide aux adolescents qui souffrent de douleur causée par l'arthrite juvénile (AJ) [4]. Plus récemment, elle a créé l'application « escouade de la douleur » (Pain Squad) pour téléphone intelligent, un outil pour mesurer la douleur chez les enfants et les adolescents atteints d'un cancer. Cette application a remporté de nombreux prix [5].

J'ai eu le plaisir de discuter avec Madame Stinson au sujet de son expérience avec la santé mobile, ses points de vue sur l'avenir de la santé mobile et ses conseils pour les professionnels de la santé et les apprenants qui aimeraient intégrer la technologie mobile dans leur propre pratique. L'article qui suit est une version abrégée de cette conversation.

Can you please tell us a bit about yourself, your background in healthcare, and your current research interests?

I am a nurse clinician scientist and nurse practitioner in the chronic pain program at SickKids as well as an Associate Professor in the Lawrence S. Bloomberg Faculty of Nursing, Institute of Medical Sciences and Institute for Health Policy and Management at the University of Toronto. The aim of my program of research is to improve the way healthcare is delivered to children with life threatening and chronic illnesses and their families in Canada using the latest in information and communications technolo-

gies (ICTs). More specifically, my research focuses on the use of ICTs (the Internet and smartphones) to (a) assess and manage disease-related pain and other symptoms and (b) deliver innovative disease self-management and transitional care programs to these at-risk populations.

How did you initially become interested and involved in e-health and, more specifically, m-health?

I became interested in e- and m-health during my doctoral and post-doctoral training in which I developed and tested a pain e-diary and an internet-based disease self-management program using juvenile idiopathic arthritis (JIA) as a prototypical model of childhood chronic illness. This model of care delivery (symptom monitoring e-diary and web-based disease management program) is now being applied to youth with cancer, hemophilia, and solid organ transplants, as well as children (aged 8-11 years) with JIA and their parents. More recently, I became interested in mobile health since the teens I was working with in the chronic pain clinic were all using smartphones, so I thought that I could harness the potential of this technology to help them better cope with their pain.

Can you give us a brief overview of the projects that you are currently working on?

My research lab is currently conducting a number of studies focusing on developing and testing new mobile health applications. The first is "Pain Squad", an iPhone-based pain tracking tool for children and youth ages 8-18 years with cancer. We are just finishing a multi-centered study that is determining the validity and responsiveness (see the glossary for an explanation of these terms) of this tool (funded by Children's Cancer and Blood Disorder Centres). A doctoral student in my lab is now developing "Pain Squad+" which builds upon the tracking features of the original Pain Squad app to provide in-the-moment advice to help children with cancer better manage their pain in hospital and home-based settings. In the Fall, she will be conducting a pilot pre- and post-test study to determine the feasibility (see the glossary for an explanation of this term) of the program and obtain preliminary estimates of the app's impact on pain and other health outcomes (funded by CIHR and Alex's Lemonade Stand). Another post-doctoral student in my lab is developing and testing the usability and feasibility of an integrated smartphone and web-based app for youth and young adults with chronic pain (Funded by CIHR). We are also conducting a pilot randomized controlled

trial to evaluate the feasibility and effectiveness of a Skype-based peer-to-peer support program for youth with arthritis and chronic pain (Funded by CIHR). Finally, we are developing a health game for school-age children with arthritis to learn how to jointly manage their chronic health condition with their parents.

We are partnering with Algoma Gaming for Health to develop this new game (Funded by CIHR).

What is the current state of m-health in terms of clinical utilization?

M-health has recently been described as the "wild west" of healthcare since there are over 40,000 health apps on the market, but very little regulation. For example, our lab recently conducted a review of the patient focused pain apps across the various app stores (iTunes, Google Play, Windows Store, and BlackBerry World) and found over 224 apps [6]. However, the vast majority (86%) did not include health care providers in their development and only one had any evidence of being evaluated in terms of its impact on health outcomes. There is a movement to develop app formularies so that clinicians will know which health apps they should recommend to their patients.

How would you recommend that interested healthcare practitioners and trainees go about integrating m-health strategies into their patient care?

Consumers are driving much of the demand for mobile health and other technologies. Mobile apps are enhancing overall consumer engagement in health care by increasing the flow of information; lowering costs through better decision-making, fewer in-person visits, and greater adherence to treatment plans, and improving satisfaction with the service experience. The difficulty is that clinicians are busy and don't have the time to review all the apps that are available for various health problems. A mechanism to certify health apps would go a long way towards helping clinicians determine which apps have evidence of clinical impact and data security. For example, the formation of a review organization, much like the Health On the Net Foundation (HON), to create a set of guidelines and standardized approaches for developing mHealth apps that incorporate safety, accuracy, and security from the get-go, would be very helpful [7]. Furthermore, the organization could implement a certification process to address privacy vulnerabilities and potential harms of the m-Health app.

How would you recommend that interested healthcare practitioners and trainees go about getting involved in m-health development?

At SickKids we have developed several ways to engage clinicians in the development of mobile health applications. We have held several "Hacking Health" events that bring together experts in mobile app development (e.g., designers and programmers) and clinicians to innovate new health apps. We also recently held a "Taking SickKids Mobile" competition where clinicians submitted ideas for health apps. Six app ideas were chosen and the teams are partnering with colleges and universities in Toronto,

as well as business partners, to develop minimal viable products

What role do you see m-health and e-health, in general, occupying in the future of clinical practice?

Digital technologies, including ubiquitous mobile devices, will play a key role in transforming health care into a more-efficient, patient-centered system of care in which individuals have instant, on-demand access to their medical records and powerful clinical decision support tools that empower them to actively participate in their treatment plans. The vast amount of data (called "big data") collected from these devices, as well as wearable sensors that capture physiologic data, will also help enable clinicians to provide more personalized medicine.

GLOSSARY
Feasibility – how easily a pain measure can be scored and interpreted.

Responsiveness – ability of a pain measure to identify changes in pain over time that is clinically important to patients.

Validity – assesses whether the scale is measuring what it is intending to measure.

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