LA MÉDECINE GLOBALE AU TEMPS DELÀ COVID-19: QUEL AVENIR POUR LA TÉLÉSANTÉ?

Elham Emami
DDS, MSc, PhD

McGill | Faculty of Dentistry

E-HEALTH DEFINITION

E-health is a field in the intersection of medical informatics, public health and business, referring to health services and information delivered or enhanced through the internet and other related technologies.

Eysenbach G. (2001)

E-HEALTH LIFE CYCLE

- **Development:** Needs and readiness assessment

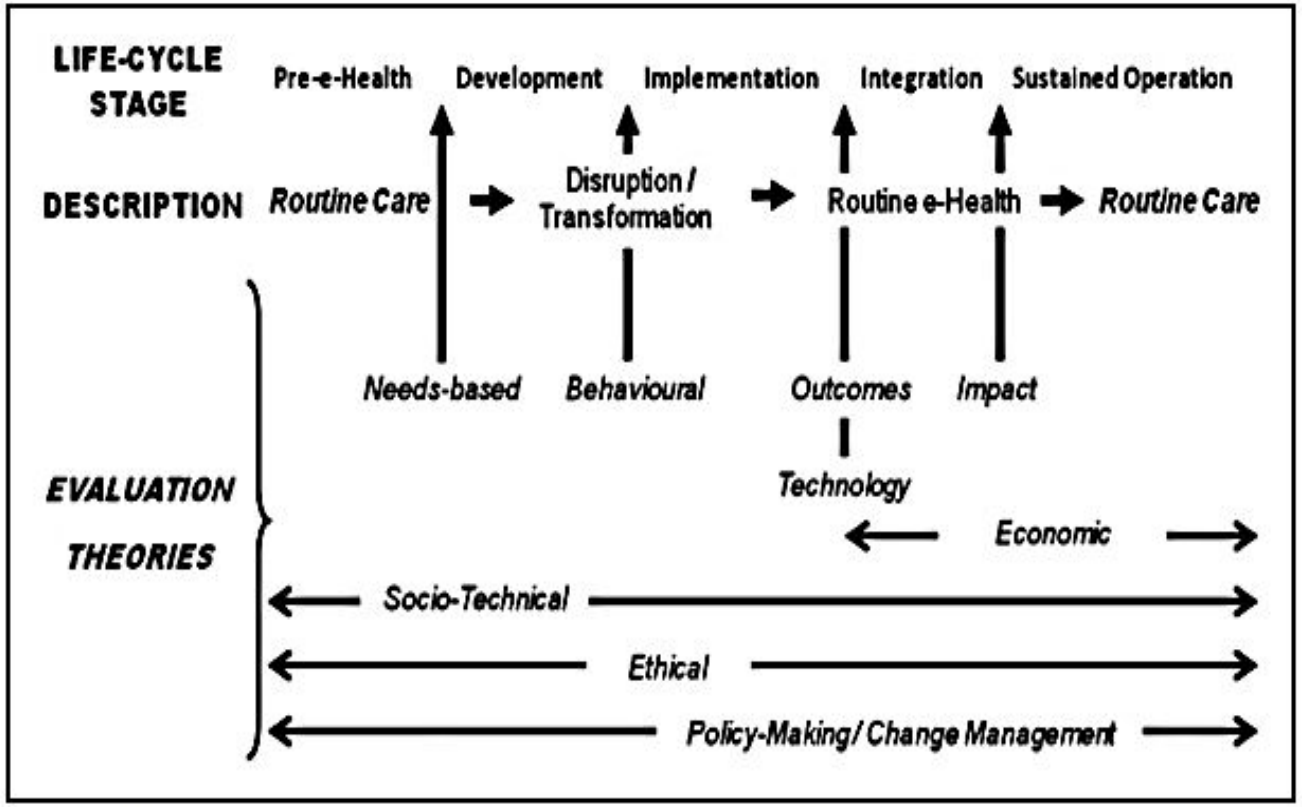
  (at 5 levels: patient, public, provider, organization, system)
- **Implementation**: Software and hardware procurement, operational planning, installation, running and quality assurance
- **Integration:** e-health and traditional health care systems
- **Sustained operation**: Long-term performance

Scott RE. (2010)

THEORIES IN E-HEALTH RESEARCH

- Needs-based evaluation theories
- Behavioral Change theories
- Implementation Theories

The alignment of evaluation theories with different stages of the e-health life cycle

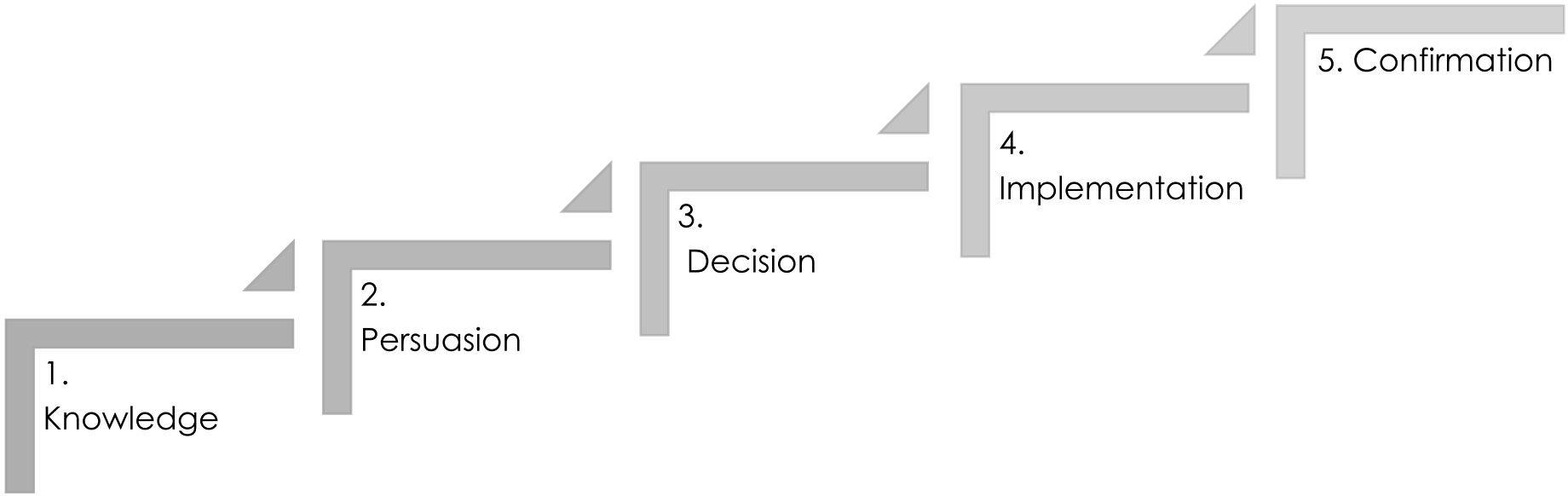


Khoja S. et al. (2013)

E-HEALTH THEORIES

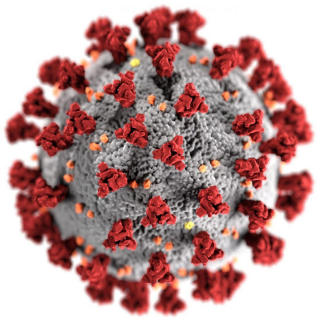
Diffusion theories	User acceptance theories	Personality theories	Organization structure theories
• Diffusion of Innovation Theory (Rogers 1962) • Technology Lifecycle Theory (Rogers 1962; Moore1995)	• Theory of Reasoned Action (Ajzen and Fishbein 1973, 1975) • Theory of Planned Behaviour (Ajzen 1991) • Technology Acceptance Model (Davis 1989) • Motivational Model (Vallerand 1997) • Unified Theory of Acceptance and Use of Technology (UTAUT) (Vankatesh et al. 2003)	• Technology Lifecycle Theory (Rogers 1962; Moore 1995) • Non-technology-related approaches : Social Cognitive Theories (Compeau and Higgins 1995)	• Disruptive Technology Theory (Bower and Christensen 1995) • Creative Destruction Theory (Schumpeter 1912, 1942)

Innovation Diffusion Theory (IDT)

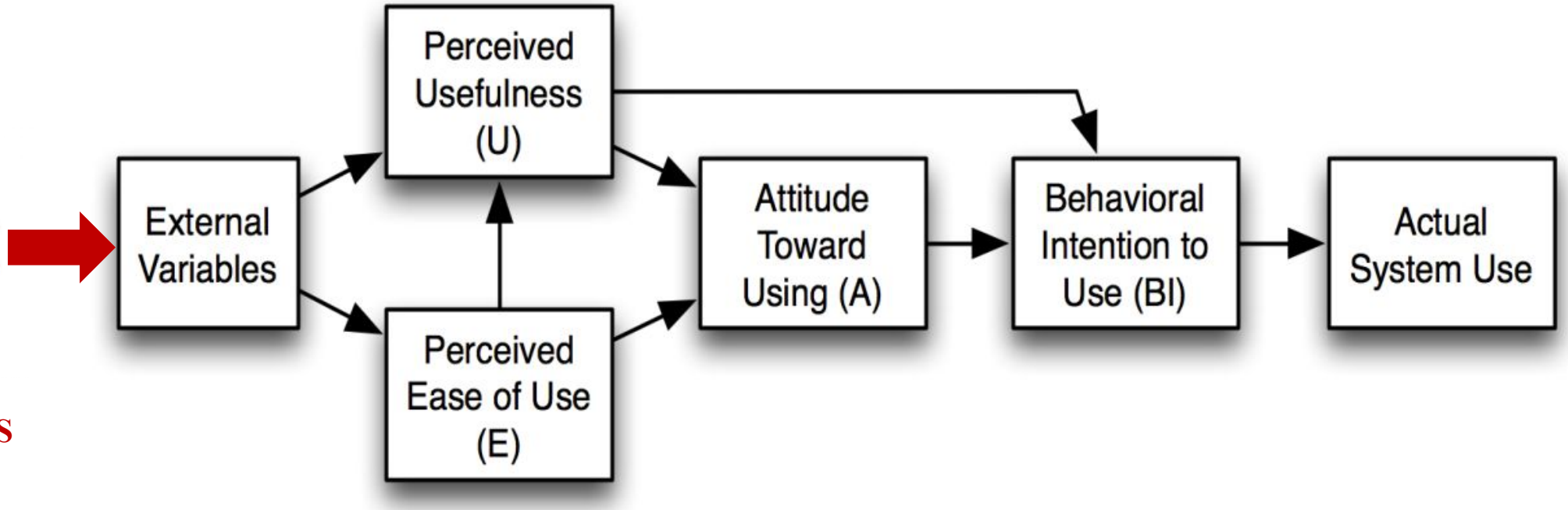


Rogers, E. (1962), Schwarz, F., et al. (2014) ,Roman, R., (2003)

Technology Acceptance Model (TAM)

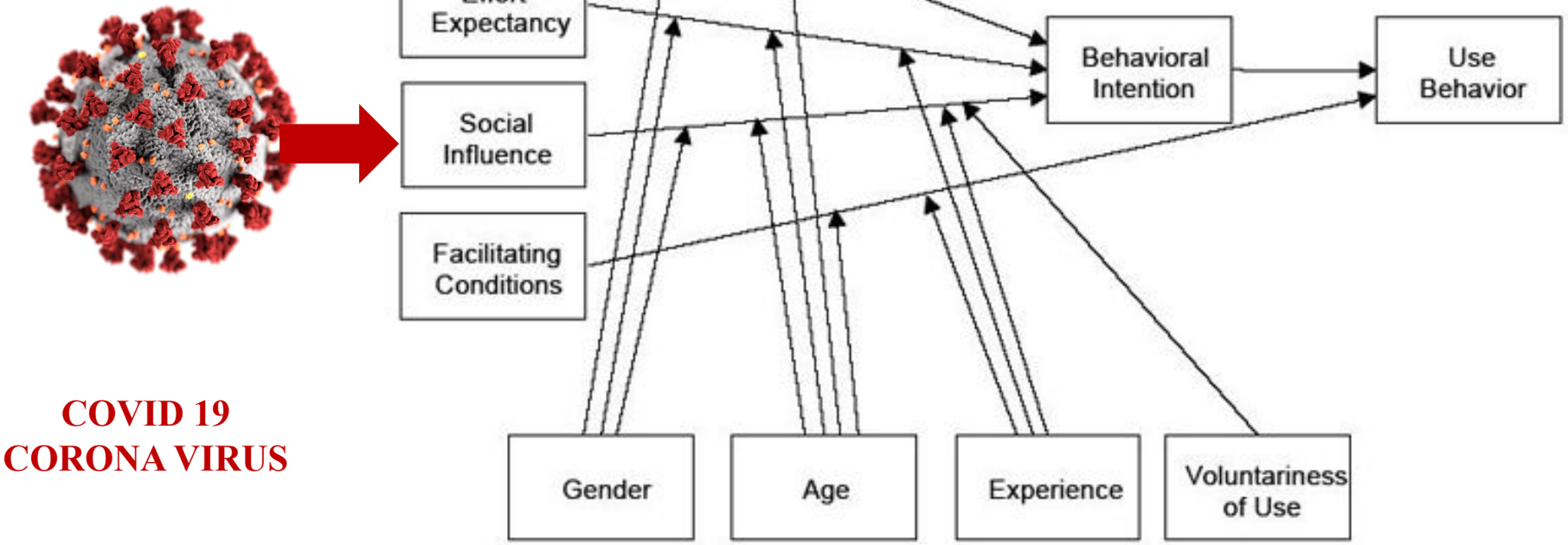


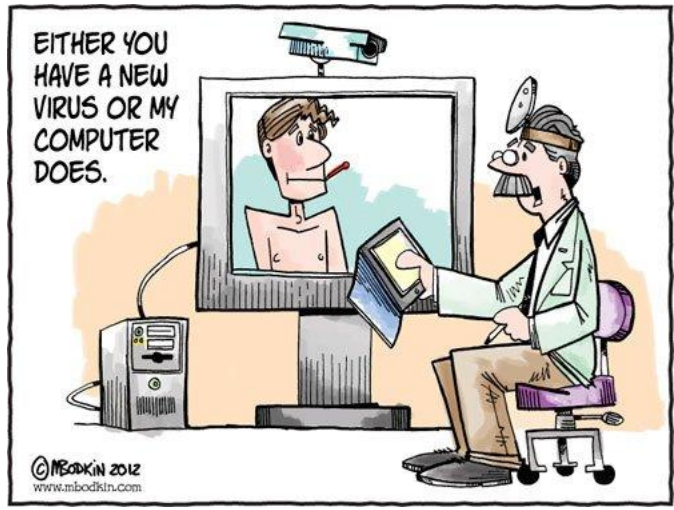
COVID 19
CORONA VIRUS



Maillet E., et al. (2015), Davis, Bagozzi & Warshaw (1989)

Unified Theory of Acceptance and Use of Technology (UTAUT)





COVID 19
CORONA VIRUS

Maillet E., et al. (2015), Venkatesh et al. (2003)

E-HEALTH TECHNOLOGY: BARRIERS

Health care organizations	Health care providers	Patients

• E-health illiteracy
• High cost of e-technology
• Need for staff training
• Long-term sustainability of e-health platforms
• Lack of evidence in regard to its effectiveness
	• E-health illiteracy
	• Additional work burden
	• Uncertain payoffs
	• Professionalism
	• Socio-cultural characteristics
		• E-health illiteracy
		• Fear of technology:
		  • Privacy and trust concerns
		  • Reliability of information
		  • Loss of direct contact with health professional
		• Socio-cultural and socio-economic characteristics

"What's going on? Your blog post on the challenges of working at home was supposed to be in two hours ago!"

"I can't remember—do I work at home or do I live at work?"

E-HEALTH READINESS

The scientific literature highlights the importance of *e*-health readiness in the adoption and implementation of *e*-health technologies.

"*The degree to which users, healthcare institutions, and the healthcare system itself, are prepared to participate and succeed with e-health implementation.*"

CANARIE- report, 2002 Jennett, 2003; Flores-Myr, 2006; Ross et al, 2016

DIMENSIONS OF E-HEALTH READINESS

- **Governmental readiness**: Presence of relevant policies and funding
- **Organizational readiness**: Presence of policies & management support
- **Societal readiness:** Interaction of health care institutions with their government and communities

- **Structural and technological readiness**: Skilled human resources, ICT and technical structures, training
- **Health care provider readiness:** experience, perception and receptiveness towards the use of e-health technology

- **Engagement readiness**: Willingness to be trained, awareness & debating advantages and disadvantages
- **Core readiness:** Express need and dissatisfaction with current provision of e-health
- **Public/patient readiness:** Personal experience, financial capacity and receptiveness towards the use of e-health

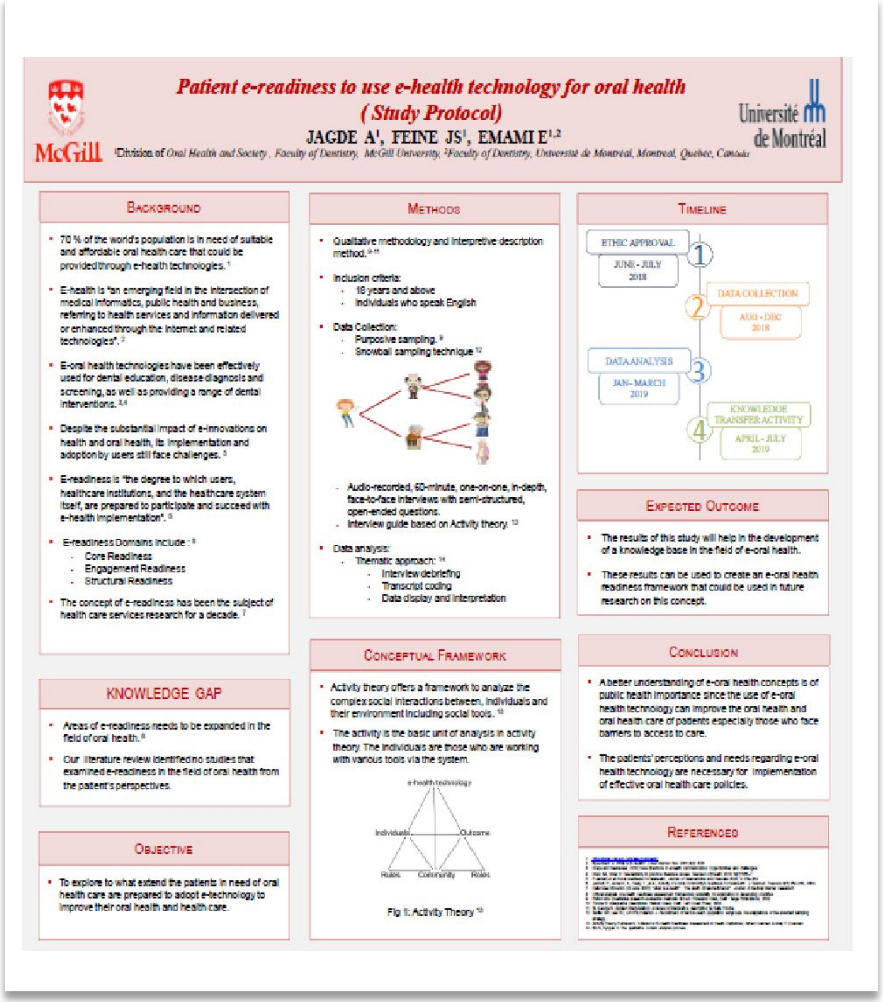
Jennet et al. (2003), Yusif et al. (2017)

PATIENTS' READINESS TO USE *e*-ORAL HEALTH TECHNOLOGIES

OBJECTIVE

- To explore patients' readiness for the use of *e*-oral health technology.

Jagde AK, Fiene J, Shrivastava R, Emami E. Patients' readiness to use e-oral health technologies. J Dent Res 99 (Spec Iss A): #0098, 2020



Patient e-readiness to use e-health technology for oral health
(Study Protocol)

JAGDE A[1], FEINE JS[1], EMAMI E[1,2]

[1]Division of Oral Health and Society , Faculty of Dentistry, McGill University, [2]Faculty of Dentistry, Université de Montréal, Montreal, Quebec, Canada

Background

- 70 % of the world's population is in need of suitable and affordable oral health care that could be provided through e-health technologies.
- E-health is "an emerging field in the intersection of medical informatics, public health and business, referring to health services and information delivered or enhanced through the Internet and related technologies".
- E-oral health technologies have been effectively used for dental education, disease diagnosis and screening, as well as providing a range of dental interventions.
- Despite the substantial impact of e-innovations on health and oral health, its implementation and adoption by users still face challenges.
- E-readiness is "the degree to which users, healthcare institutions, and the healthcare system itself, are prepared to participate and succeed with e-health implementation".
- E-readiness Domains include :
  - Core Readiness
  - Engagement Readiness
  - Structural Readiness
- The concept of e-readiness has been the subject of health care services research for a decade.

Knowledge Gap

- Areas of e-readiness needs to be expanded in the field of oral health.
- Our literature review identified no studies that examined e-readiness in the field of oral health from the patient's perspectives.

Objective

- To explore to what extend the patients in need of oral health care are prepared to adopt e-technology to improve their oral health and health care.

Methods

- Qualitative methodology and interpretive description method.
- Inclusion criteria:
  - 18 years and above
  - Individuals who speak English
- Data Collection:
  - Purposive sampling.
  - Snowball sampling technique
- Audio-recorded, 60-minute, one-on-one, in-depth, face-to-face interviews with semi-structured, open-ended questions.
- Interview guide based on Activity theory.
- Data analysis:
  - Thematic approach:
    - Interview debriefing
    - Transcript coding
    - Data display and interpretation

Conceptual Framework

- Activity theory offers a framework to analyze the complex social interactions between, individuals and their environment including social tools.
- The activity is the basic unit of analysis in activity theory. The individuals are those who are working with various tools via the system.

Fig 1: Activity Theory

Timeline

ETHIC APPROVAL — JUNE - JULY 2018 — 1
DATA COLLECTION — AUG - DEC 2018 — 2
DATA ANALYSIS — JAN- MARCH 2019 — 3
KNOWLEDGE TRANSFER ACTIVITY — APRIL- JULY 2019 — 4

Expected Outcome

- The results of this study will help in the development of a knowledge base in the field of e-oral health.
- These results can be used to create an e-oral health readiness framework that could be used in future research on this concept.

Conclusion

- A better understanding of e-oral health concepts is of public health importance since the use of e-oral health technology can improve the oral health and oral health care of patients especially those who face barriers to access to care.
- The patients' perceptions and needs regarding e-oral health technology are necessary for implementation of effective oral health care policies.

References

METHODOLOGY / METHODS

- **SETTINGS**: McGill University dental clinics and affiliated hospitals, as well as private and public dental care clinics.
- **RECRUITEMENT**: Purposeful, maximum variation sampling & snowball techniques.
- **INCLUSION CRITERA**: Patients aged 18+ , with different cultural, educational and socio-economic backgrounds, able to communicate in English, seeking oral health care for themselves or their families,
- **DATA COLLECTION**: Face-to-face, semi-structured, 60-90-min. audio-recorded interviews.
- **THEMATIC ANALYSIS**: Data debriefing, transcript coding, data display and interpretation.

Thorne (2016); Sadler et al. (2010)

RESULTS

Study participants' profile	
Characteristics	N (15)
Age	
• 20 – 40 years	11
• 40 – 60 years	2
• 60 – 80 years	2
Gender	
• Male	7
• Female	8
Residential status	
• Immigrant	10
• Canadian	5
Education	
• Elementary	2
• Secondary	1
• Higher/ University	12
Domestic Status	
• Living alone	8
• Living with partner or child	7

1. READINESS

- Most participants demonstrated a positive perception and receptiveness towards e-oral health service utilisation.
- Participants expressed their interest, primarily in active learning.

> *If something like that is there which is specifically prepared for the e-dentistry, I would be happy to learn about that.*

> *The young generation is very dependent on the technology. So, they will use the technology and will teach their parents, their grandparents to use it to for their health problems.*

2. UNLOCK BARRIERS

- Participants considered *e*-health to be a solution to unlocking oral health care access barriers such as lack of information, language barriers, financial challenges, not having dental insurance coverage, long waiting hours to see a dentist in the public setting.

> *I think it is innovative idea which could be the facilitator, I think it would improve the oral health care and oral health care access.*
>
> *Well, if it will happen, I would be very satisfied. I believe it's a very good future application to be done for people even for citizens or for the newcomers to Canada.*

3. PERCEIVED BENEFITS & DISADVANTAGES

Benefits:

- Affordability
- Cost-effectiveness
- Easier access to health information and health care services

Disadvantages:

- Lack of physical interaction with the dentist
- Technical issues
- Data security and privacy issues

The Effectiveness of e-Oral Health in Rural and Remote Communities: *A Systematic Review*

OBJECTIVE

- This study aims to systematically examine the effectiveness of e-oral health care in rural and remote communities.

Emami *et al. Systematic Reviews* (2017) 6:174
DOI 10.1186/s13643-017-0550-3

Systematic Reviews

PROTOCOL Open Access

Patient satisfaction with E-Oral Health care in rural and remote settings: a systematic review protocol

Elham Emami[1,2,3,4*], Naomi Kadoch[5], Sara Homayounfar[6], Hermina Harnagea[2], Patrice Dupont[7], Nicolas Giraudeau[8] and Rodrigo Mariño[9]

Abstract

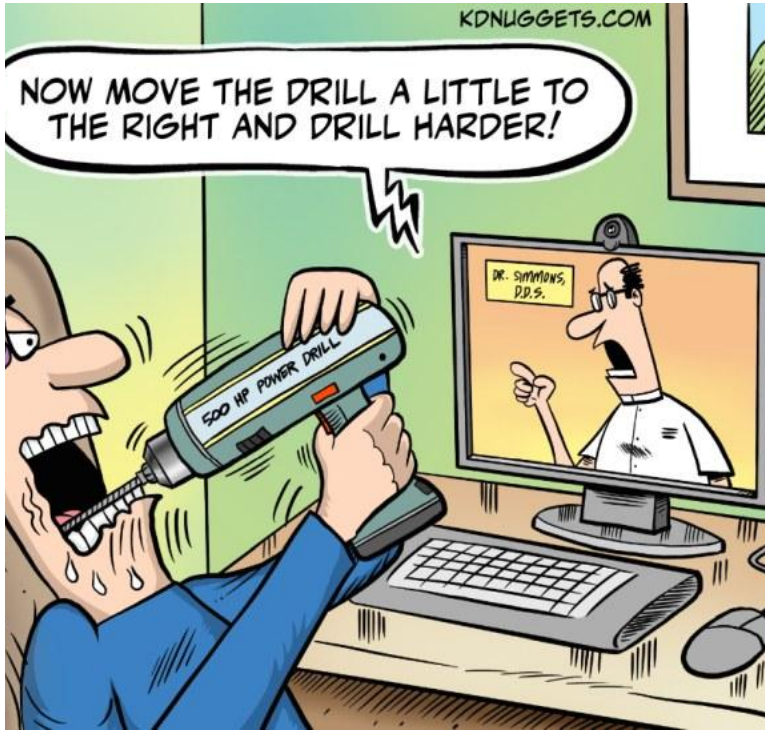
Background: Individuals living in rural and remote settings face oral health problems and access-to-care barriers due to the shortage of oral health care providers in these areas, geographic remoteness, lack of appropriate infrastructure and lower socio-economic status. E-Oral Health technology could mitigate these barriers by providing the delivery of some aspects of health care and exchange of information across geographic distances. This review will systematically evaluate the literature on patient satisfaction with received E-Oral Health care in rural and remote communities.

Methods: This systematic review will include interventional and observational studies in which E-Oral Health technology is used as an intervention in rural and remote communities of any country worldwide. Conventional oral health care will be used as a comparator when provided. Patient satisfaction with received E-Oral Health care will be considered as a primary outcome for this review. Cochrane Central Register of Controlled Trials, MEDLINE, EMBASE and Global Health will be searched using a comprehensive search strategy. Two review authors will independently screen results to identify potentially eligible studies and independently extract the data from the included studies. A third author will resolve any discrepancies between reviewers. Two independent researchers will assess the risk of bias and the Grading of Recommendations Assessment, Development, and Evaluation.

Discussion: The potential implications and benefits of E-Oral Health care can inform policymakers and health care professionals to take advantage of this technology to address health care challenges in these areas.

Systematic review registration: PROSPERO CRD42016039942.

Keywords: E-Health, E-Oral Health, Teledentistry, Rural and remote communities, Patient satisfaction



RESULTS

- **Studies' countries:** US, Canada, UK, Spain, Italy, Finland, Dominican Republic, India.
- **Date of publications:** 1998 to 2016.
- **Overreaching goals:** To improve oral health care services across rural and remote populations.
- **Type of studies:** Evaluation studies.
- **Study design:** Observational (cross-sectional, follow-ups, pilot/feasibility/ demonstration project), quasi-experimental.

- **Purpose of e-health interventions:** 1) Clinical decision support systems-diagnosis/disease management, 2) Education and training, 3) Data collection tools/dental records.
- **Field of application:** Oral and Maxillofacial Surgery, Radiology, Pathology and Oral Medicine, Orthodontics, Prosthodontics, Pediatric Dentistry.
- **Sample size variation:** 25 to 3440 participants.
- **Reported outcomes:** Usability; clinical- & educational-effectiveness; patient-related outcomes; cost-effectiveness and care services outcomes (costs, number of visits & travel).

Author Year of Study	Study type/Discipline/ Participants' number	E-health application/type	Results
Patterson & Botchway, 1998	Pilot /non consecutive study/general dentistry/ n=32	Diagnosis/Tele-screening	Agreement with traditional method 88-100%
Scuffham & Steed, 2002	Case-study/general dentistry/ n=25	Clinical decision making/Tele-consultation	cost health organization; cost for patient compared to outreach ; reverse results compared to hospital consultation
Dimmick et al., 2003	Descriptive demonstration project/general practice/ n= 44 000 for Integrated Tele-health Network	Clinical decision making/Tele-consultation	travel time; speciality care
Berndt et al., 2008	Quasi-experimental/ orthodontics/n=30	Clinical training/Tele-education	Comparable peer-assessment rating on educational objectives; proficiency
Ignatius et al., 2010	Survey/general practice/n=49	Clinical decision making/Tele-consultation	Professional's & patients' satisfaction; satisfaction by degree of remoteness ($p<0.01$)
Herce et al., 2011	Quasi-experimental/oral surgery/ n=102	TX-management/Tele-consultation	referral speed (88%), number of visits, cancellation rate ($p<0.005$)
Keepanasseril et al., 2011	Quasi-experimental/prosthodontics/n=60	Clinical training/Tele-education	Comparable TX results/patient satisfaction with the TX ($p=0.56$)
Summerfelt, 2011	Demonstration project /preventive dentistry/n=67	Clinical supervision, training/Tele-dentistry-assisted dental hygiene practice	Similar results for stimulated remote dental hygienist acts (x- rays) ($p>0.05$); ease of technology training.
Salazar-Fernandez et al., 2012	Quasi-experimental/oral medicine/n=1052	Clinical decision making /management/Tele-consultation	waiting time for TX , $p=0.00$ lost working hours/patient, 50% less ($p=0.00$), about 80% satisfied with Tele-consultation
Parrish et al., 2014	Descriptive feasibility study/oral medicine/n=158 (images)	Diagnosis/Tele-screening	Utility and accuracy of digital images and mobile health application for disease surveillance
Birur et al., 2015	Descriptive/oral medicine/n= 3440	Diagnosis/Tele-screening	Utility and accuracy of digital images and mobile health application for disease surveillance
Desai et al., 2015	Descriptive/oral medicine/n=1357	Diagnosis/Tele-screening	Utility and accuracy of digital images and mobile health application for disease surveillance
McLaren & Kopycka-Kedzierawski 2016	Retrospective descriptive/Paediatric Dentistry/n=251	Clinical decision making/Tele-consultation	Similar compliance rate ($p>0.05$)
Petruzzi & De Benedittis, 2016	Cross-sectional/oral medicine/n=360 (images)	Diagnosis/Tele-screening and diagnostic	Utility and accuracy of digital images and mobile health

TO DO LIST

- Develop policies and legislation on *e*-oral health: education, practice and research
- Education: Integration in the curriculum
- Development and validation of research instruments; conduct higher quality studies
- Training: Research, practice
- Innovation: outreach, *e*-oral health-based applications