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MODULE NAME: POPULATION HEALTH AND DIGITALHEALTH PROMOTION
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ASSIGNMENT TITLE:

PART-A:

BLOG 1-THE IMPACT OF MHEALTH APPLICATION IN PREVENTION OF COVID-19

BLOG 2- IMPACT OF TELEHEALTH ROBOT IN MENTAL ILLNESS

PART-B:

POSTER DESIGN ON TELEHEALTH ROBOTS TO MANAGE THE MENTAL ILLNESS

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TASK A:

BLOG 1

COVID-19 is a serious health concern caused by SARS-CoV-2, which spreads rapidly through respiratory droplets and contaminated surfaces. With more than 220 million confirmed cases and 4.5 million deaths worldwide, its impact is huge. Overwhelmed health systems face shortages and vulnerable populations with serious illnesses and long-term effects (Douglas M. et al.). Vaccines have been developed, but new variants are raising concerns about their effectiveness. The pandemic has also taken a toll on mental health and widening health disparities, disproportionately affecting marginalized communities. To combat COVID-19, a unified effort is needed and global health coordination to effectively address its multifaceted impact.

Use of contact tracing apps

Contact tracing apps are using Bluetooth technology, these apps notify people who have been in close contact with someone who is positive for COVID-19, enabling early detection and taking preventive measures. They streamline contact tracing efforts, conserve resources, and increase reach. Ensuring user privacy, these apps use anonymous IDs and work in conjunction with traditional manual tracking methods, providing more accurate data. Studies show their effectiveness in helping control outbreaks and complement public health strategies (Sun K. et al.). In 2020, a study found that digital contact tracing reduces the transmission of SARS-CoV-2 (Sun K. et al.) Oxford researchers found positive user attitudes in a 2020 survey. A systematic review in JMIR mHealth and uHealth (2020) emphasized privacy protection. Contact tracing apps are effective in reducing COVID-19 transmission, detecting cases, and ensuring privacy (Kan W et al.).



Positive impact of app

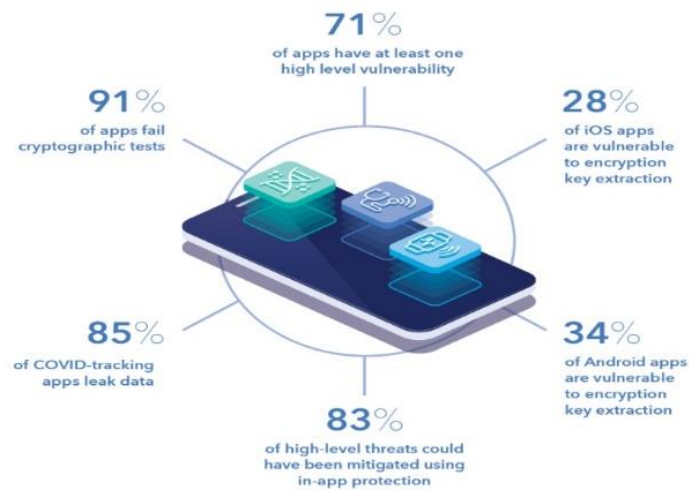
Contact tracing applications aid in early detection of potential COVID-19 infections, allowing individuals to be tested and isolated quickly, which can help break the chain of transmission (Sun K. et al.). These apps streamline the contact tracing process, allowing large numbers of people to be informed of possible exposure in a shorter amount of time, improving the efficiency and scalability of contact tracing efforts. Contact tracing apps work in tandem with traditional manual tracking, providing additional data and improving the overall effectiveness of contact tracing (Sun K. et al.).

Negative impacts of app

Contact tracing apps have raised privacy concerns regarding the collection and processing of personal data, despite efforts to ensure user privacy (Ken M. 2016). Widespread adoption and maintenance of public trust in the technology has been difficult. Some applications may produce false positives or negatives, leading to unnecessary anxiety or missed cases. The effectiveness of contact tracing apps is highly dependent on how accurately users report symptoms and test results. Addressing these vulnerabilities is critical to maximizing the potential of contact tracing apps to promote health, while balancing privacy concerns and ensuring public access (Ken M. 2016).

Today's mHealth apps are at risk

The assessment revealed major security gaps in mobile medical apps across the board.



Solutions

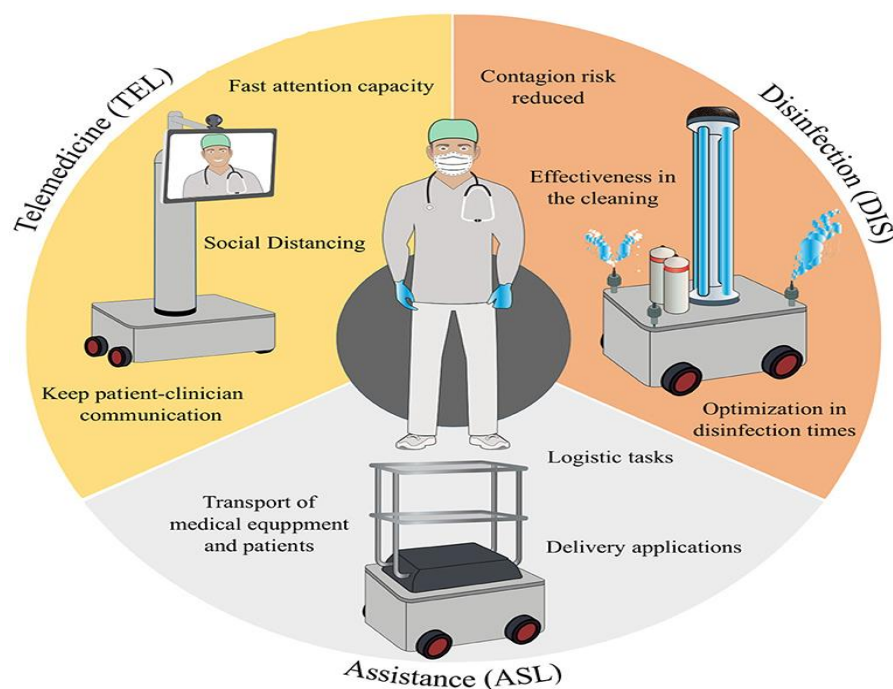
Build privacy-focused contact tracing apps with transparent data usage. Educate the public about the benefits and privacy of the app. Ensure comprehensiveness and accessibility for diverse users. Promote cooperation and standardization among countries. Continually improve app performance and engage the community. Ensure accurate data reporting and integration with healthcare systems. Always adapt and integrate applications with broader public health measures (Lin Y et al.).

BLOG 2

Mental health is an important public health issue due to its widespread impact on individuals and society. According to the World Health Organization (WHO), about 1 in 4 people worldwide will experience a mental health disorder at some point in their lives. Mental health disorders contribute to disability-adjusted life years (DALY) and economic burden. COVID-19 has exacerbated mental health problems. Addressing mental health is critical to promoting overall health and improving public health outcomes (WHO, 2021).

Advance technology

Mental health telemedicine will see advances in AI-powered mental health robots and virtual assistants, virtual reality therapy sessions for immersive treatment, augmented use remote monitoring tools to assess mental health and expand access through remote mental health services. These innovations will improve convenience, reduce stigma, and improve access to mental health care, leading to more effective, patient-centered treatments for those who need it.



Usage

The robots will enable remote mental health consultations, therapy sessions and assessments, and provide personalized and accessible care to individuals. They will improve patient engagement and reduce barriers

to seeking mental health support. Research shows the potential of tele medical robots in improving patient outcomes and healthcare delivery making them a promising tool for address mental health challenges in any age groups.

Pros and cons of AI robots

Robots in health promotion offer benefits such as improved access to care, remote monitoring, and accuracy of medical procedures. They can assist healthcare professionals, streamline processes, and reach underserved areas. The downsides, however, include high upfront costs, the less possibility of belief, and ethical concerns regarding patient-robot interactions. It is important to ensure adequate training and to address regulatory and security issues. Studies such as highlight the potential of telemedicine robotics, but also highlight the need for thoughtful implementation and ongoing evaluation.

Solution of shortfall

To address the shortfall of robots in health promotion, deploy cost-sharing models to make the technology affordable. Invest in training healthcare professionals to adapt to robotic care (A Rabé et al.). Develop clear ethical guidelines and a legal framework for safe and appropriate use (). Emphasize human-robot cooperation and continuous evaluation. Engage patients and the public in discussions to build trust and ensure responsible implementation (A Rabé et al.).

TASK B:

POSTER DESIGN ON TELEHEALTH ROBOTS TO MANAGE MENTAL ILLNESS

Background

The scale of the mental health problem is enormous, affecting millions of people around the world. According to the World Health Organization (WHO), more than 264 million people suffer from depression and about 284 million people suffer from anxiety disorders worldwide. Mental health disorders account for 10% of the global burden of disease. Intervention is necessary because of the severe impact on individual well-being, society and economic productivity. Stigma, lack of awareness, and a growing burden contribute to delayed or inadequate care-seeking behavior. Interventions are needed to promote early detection, increase access to mental health services, reduce mental health stigma and integrate mental health into primary health care, thereby improving mental health. Improve quality of life and overall health.

Non digital interventions

Large-scale vaccination programs have eliminated diseases such as smallpox and significantly reduced the burden of polio and measles (WHO, 2021). Access to safe drinking water and adequate sanitation has significantly reduced waterborne diseases (Prüss-Ustün et al., 2019). Trained community health workers provide essential health services, health education and prevention measures in underserved areas (Perry et al., 2014).

Digital interventions

Telemedicine services, teleconsultation, and remote monitoring provide accessible medical care (Wade et al., 2015). Mobile Health (mHealth) App: Smartphone apps provide health information, reminders and behavior change interventions to support a healthier lifestyle (Krebs & Duncan, 2015).

Telemedicine robotics is a digital health intervention that uses robotic technology to support telemedicine consultation and services. These robots, equipped with cameras, screens and sensors, allow healthcare professionals to virtually interact with patients. They can perform physical exams, share medical images, and provide real-time monitoring. Telemedicine robots improve access to healthcare, especially in remote or disadvantaged areas, reducing the need for face-to-face visits and improving communication between patients and specialists, healthcare family. Studies have shown their effectiveness in different medical specialties, supporting the delivery of quality care (Keshavjee et al., 2013; Lampe et al., 2019).

Health promotion values and principles

Equity: Ensuring fair and equal access to health resources and opportunities, addressing health disparities, and promoting social justice in health outcomes. (WHO, 2021)

Empowerment: Encouraging individuals and communities to take control of their health by providing knowledge, skills, and resources for informed decision-making. (WHO, 2021)

Participation: Involving stakeholders and communities in the design and implementation of health promotion programs, fostering ownership and sustainability. (WHO, 2021)

Holistic Approach: Addressing the interconnectedness of physical, mental, social, and environmental aspects of health in promoting overall well-being. (WHO, 2021)

Evidence-Based Practice: Using the best available evidence and research to inform health promotion strategies and interventions. (WHO, 2021)

Sustainability: Designing interventions that are feasible, enduring, and integrated into existing health systems to maximize long-term impact. (WHO, 2021)

Ethical Considerations: Upholding ethical principles such as respect for autonomy, confidentiality, and consent in all health promotion activities. (WHO, 2021)

Intersectoral Collaboration: Engaging multiple sectors (e.g., health, education, environment) to work together in achieving common health goals. (WHO, 2021)

Telemedicine provides patients with access to health information, allowing them to actively participate in care decisions and take control of their health, thereby promoting patient empowerment. Patients are actively participating in their healthcare through virtual consultations, sharing their concerns and preferences, promoting patient-centered care, and participating in the process and decision making (WHO, 2021). Telemedicine supports sustainable healthcare practices by optimizing resources, minimizing unnecessary travel, and enabling better allocation of healthcare resources.

Behaviour change theory

A commonly used theory of behavior change in telemedicine interventions is the Trans-Theory Model (TTM), also known as the Stages of Change Model. Developed by Prochaska and DiClemente in the 1980s, TTM proposes that individuals progress through a series of stages when it comes to implementing behavior change. The five phases of TTM are:

1. **Anticipation:** At this stage, individuals are not aware or seriously considering changing their behavior.
2. **Contemplation:** Individuals begin to recognize the need for change and consider the pros and cons of implementing change.
3. **Preparation:** At this stage, individuals intend to act quickly and can begin to plan for change.
4. **Share:** Individuals actively modify their behavior and work to sustain the change.
5. **Interview:** At this stage, individuals try to maintain change over time, avoiding reverting to old behaviors.

The TTM suggests that successful interventions must be tailored to an individual's stage of change. In the context of telemedicine, this means that telemedicine interventions must take into account the patient's willingness to accept telemedicine as part of their healthcare (Prochaska and DiClemente, 1980s). For example, patients in the preparatory phase may need information about the benefits of telemedicine and how it can improve their access to health care. Patients in the thinking phase may need encouragement and support to address concerns or barriers to telemedicine adoption. Those in the preparatory phase can get help with scheduling telemedicine appointments or using technology effectively.

Behavior change theory can be effectively applied in providing robotic interventions to promote health by tailoring interventions to individuals' willingness to change, promoting motivate and support sustainable behavior change. (H McKay 2016)

1. Adapt to be ready for change:

By incorporating the Trans-Theory Model (TTM) or other related theories of behavior change, robotic interventions can assess an individual's current stage of change and provide support, tailored support for each individual. The bot can use data from user interactions, preferences, and history to determine the stage and take appropriate action.

2. Personalized Motivation:

Robotic interventions can use persuasion technology and behavior change techniques to motivate individuals to adopt healthy behaviors. Through positive reinforcement, achievable goal setting, and feedback, robots can improve self-motivation and effectiveness.

3. Continuous commitment:

Bots can maintain constant interaction with users, issue timely reminders, track progress, and celebrate success. This ongoing support is important for individuals at different stages of behavior change.

4. Personalized comments:

Bots can analyze user data and provide personalized feedback, reinforcing positive behaviors and suggesting improvements. This personalized feedback increases the likelihood that the behavior will be maintained.

5. Social support:

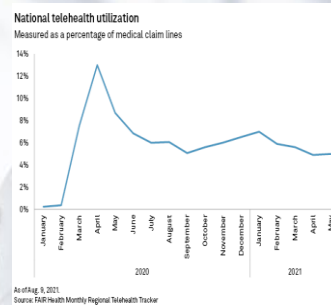
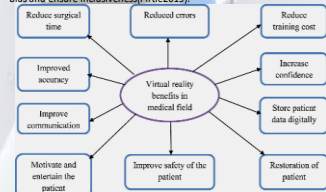
Bots can facilitate social support by connecting users to support networks, sharing success stories, and encouraging peer-to-peer interaction. Social support is an important factor in promoting lasting behavior change.

6. Behavior enhancement:

Using insights from behavioral economics, bots can apply nudges, subtle reminders, and prompts to encourage healthy choices and behaviors. (H McKay 2016)

However, some important considerations need to be taken into account:

1. **Ethical Concerns:** Bots must ensure user privacy, informed consent, and transparent use of data. Protections against manipulation or coercion are required. (Pirtle2019)
2. **User Acceptance:** Ensuring that users trust and accept the robot's intervention is critical to its effectiveness. Human traits or anthropomorphism must be carefully balanced to avoid negative reactions.
3. **Cultural sensitivities:** Robotic interventions should be culturally sensitive and contextually appropriate for diverse populations to avoid potential bias and ensure inclusiveness. (Pirtle2019).



Positive results

Improved acceptance behavior: By tailoring interventions to individuals' willingness to change, robotic health interventions can effectively promote the adoption of healthy behaviors. Personalized support and feedback can improve motivation, leading to greater success in behavior change.

Improve engagement and membership: Robotic intervention can maintain a constant interaction with the user, providing prompt prompts, feedback, and social support. This sustained interaction can improve user compliance with health-promoting behaviors.

Maintaining Long-Term Behavior: Behavioral change theory emphasizes the importance of supporting individuals through the different stages of change. Robots can facilitate ongoing support and reinforcement, increasing the likelihood of sustaining healthy behaviors over the long term.

Scalability and accessibility: Robotic interventions have the ability to scale, reach a wider audience, and overcome geographic barriers. They can improve access to health care, especially for those living in remote or disadvantaged areas.

Challenges and limitations

Robotic interventions must address ethical concerns related to user privacy, informed consent, data security, and potential bias. Ensuring bots adhere to ethical guidelines is key to building user trust and acceptance. (Keshavjee et al., 2013; Lampe et al., 2019). Acceptance of robotic interventions is critical to their success. Some people may feel uncomfortable or skeptical about the bot's health advice, resulting in low engagement and limited effectiveness. Robotic health interventions must consider cultural differences to avoid potential biases and ensure the appropriateness and effectiveness of interventions in diverse populations. Bots must be designed to provide accurate, evidence-based information, avoiding potential errors or misinformation that could undermine user trust.

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Conclusion

1. Policy:

Policymakers need to establish clear guidelines and regulations for the use of robotic health interventions. This includes issues related to data privacy, security, and ethical considerations (WHO, 2021). Develop a strong regulatory framework that ensures the safe and responsible deployment of robotic technologies in healthcare environments. Health policies may need to be adjusted to include reimbursement for telemedicine and robotic interventions. This will encourage healthcare providers to adopt these technologies, especially in remote or disadvantaged areas, where they can improve access to care, and reduce health care disparities.

2. Education:

It is important to integrate training in telehealth and robotics into medical and health education. Healthcare professionals need to know how to effectively use and leverage these technologies to optimize patient care. (WHO, 2021). Patients should be educated about the benefits, limitations, and proper use of robotic health interventions. Making sure patients understand the role robots play in healthcare and how interacting with them can improve acceptance and engagement.

3. Research:

Rigorous research is needed to evaluate the effectiveness and safety of robotic health interventions. Studies that compare with traditional healthcare delivery methods can provide evidence of the impact of these technologies on health outcomes and patient satisfaction. Research should focus on understanding the user experience and acceptance of robotic interventions by healthcare professionals and patients. Identifying factors affecting acceptance and adoption can inform design improvements and implementation strategies. Performing cost-effective analyses of robotic health interventions can guide policymakers and healthcare organizations to make informed decisions about resource allocation and invest in these technologies (Pirtle2019).

The implementation of robotic interventions in health requires careful consideration in policy formulation, education and training, and research efforts. By proactively addressing these issues, healthcare systems can harness the potential of robotic technologies to improve patient access, delivery, and outcomes.



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