

Myths or Placebo of Telemonitoring in Diabetes Management

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Key Identification

Telemedicine is defined as the direct provision of clinical care, including diagnosing, treating, or consultation, via telecommunications for a patient at a distance [1]. It may cover diverse patient care services such as telepsychiatry, teleradiology, teledermatology, and teleophthalmology. Its primary function is to provide specialist consultation to distant communities, rather than to provide a *tool for self-management of chronic disease*. On the other hand, home telecare is a rapidly evolving domain focused on providing care in a home setting with the primary intent of *supporting the patient* rather than the health professionals. Home telemonitoring is used in a more restrictive sense and encompasses the use of audio, video, and other telecommunication technologies to monitor patient status at a distance [2,3].

Role in health care setting

Home telemonitoring as an automated process for the transmission of data on a patient's health status from home to the respective health care setting. Hence, telemonitoring does not involve the electronic transmission of data by a health care professional at the patient's location.

Role in diabetic management

Mobile computing can improve the quality of the patients' life by providing systems that help diabetes patients to monitor and control their diseases [4]. These applications can help the endocrinologist by providing a remote monitoring to the patient. Database technologies can be combined with communication technologies to present an integrated diabetes monitoring tool.

Type of interventions in diabetic care

There are numerous interventions with direct impact on diabetic management, such as., continuous education, reinforcement of diet, exercise, medication adjustments, self-monitoring of blood glucose (SMBG), diabetic self-care, therapeutic advices, providing self-management skills, multidisciplinary care team, home care initiative program, management of hypoglycemia and others.

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Is it correct to provide statement telemonitoring effective in management of diabetes management?

Several studies have reported "effect of mobile phone intervention for diabetes on glycaemic control", presented in a meta-analysis by X. Liang *et al.*, (2011) [5], however the results and findings still controversial on the following presented information; a. *patients in mobile phone intervention study may be more likely to show reduction in HbA1c values because of motivation*, b. *smaller studies reported high reduction rate in HbA1c than larger studies*, and c. *maintaining life-style changes among diabetes patients is important but challenging, so telecare may play a role in supplementing behavior change intervention*. It is important to highlight the concept here that mobile phone or telemonitoring is not a *therapeutic service or Care-type intervention*, so its effect must be based on strong behavioral change theory.

Another study recently claim "diabetes telemonitoring reduces the risk of hypoglycemia during ramadhan; a pilot randomized controlled study" by Lee *et al.*, [6] reported intervention (not provided the type of intervention from week 0-week 6), feedback to participants (by whom? Type of feedback? Is the feedback on managing drug dose or lifestyle changing including dietary instructions?). Also results clearly stated "no significant

differences were noted in the levels of fructosamine, fasting plasma glucose (FBS) and lipids during or at the end of the study” yet author claimed telemonitoring group participants reported significant lower episodes of hypoglycemia (also inconsistency in randomization and study sample in Figure S1 with text). There is no rationale to provide adequate link between hypoglycemic episodes with telemonitoring. Patients with better understanding and knowledge about diabetes management (self-care) will show better control on HbA1c and FBS regardless of telemonitoring or not. However if the intervention type based on clinical practice and feedback (in term of intervention ie., drug management, pharmacotherapy changes etc) provided by telemonitoring then only patient might exhibit better outcomes.

Thus there is no clinical evidence suggested the role/impact of telemonitoring on the clinical characteristics of diabetic patients. Clinical practice literature has sufficient evidence for determining the relationship between the type of interventions (provided early) and effect to clinical characteristics of diabetic population [7,8].

Data bias

Only patients or their family members, when necessary, are responsible for keying in and transmitting their data without the help of a health care provider such as a pharmacist, nurse or a physician.

Research gaps and potentials

Conclusively telemonitoring is a patient data management system rather than intervention technique. There are several controversies need to address this matter as following:

1. Need to evaluate the clinical outcomes among 2-similar intervention arms (intervention type mention early) followed by different monitoring (with and without telemonitoring) technique.
2. Need base evaluation of telemonitoring (daily, weekly, monthly etc) - requirement or placebo?
3. What would be impact of self-care management without telemonitoring?
4. Impact of multidisciplinary team in telemonitoring - who will provide feedback, design the goal treatment for diabetes.

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