

MEDIA RELEASE

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For Immediate Publication

NUH clinical trial with mobile app nBuddy brings successful weight loss in non-alcoholic fatty liver disease patients

SINGAPORE — A team of dietitians and doctors from the National University Hospital (NUH) has found that lifestyle intervention enabled by a mobile app can be effective in achieving weight loss among adults with non-alcoholic fatty liver disease (NAFLD). Based on the study, patients who used the mobile app achieved a five-fold higher likelihood of achieving at least 5% weight loss as well as significant reduction in liver enzymes, waist circumference, systolic blood pressure and diastolic blood pressure. This study provides new insights on the feasibility and effectiveness of mobile apps in facilitating lifestyle interventions in patients with NAFLD, which may help in the development of similar treatment methods for other chronic diseases.

In Asia, an estimated 20%-30% of the adult population have been diagnosed with NAFLD, with a higher prevalence among patients with obesity. NAFLD is characterised by excessive accumulation of fat in the liver that is not directly caused by alcohol consumption. With the epidemic surge in obesity and Type 2 diabetes, the prevalence of NAFLD is on the rise, which is increasingly being recognised as a major cause of morbidity and mortality. Weight reduction is typically recommended for patients at high risks or diagnosed with NAFLD, and can be a challenge to achieve.

A group of 108 selected patients with NAFLD participated in the clinical trial, which was conducted between July 2017 and November 2019. They were taught how to utilise the Nutritionist Buddy (nBuddy) mobile app to track their diet and physical activity and induce behavioural changes to achieve optimal weight. The app was conceptualised by Dr Lim Su Lin, Chief Dietitian at NUH, who is the principal investigator of the clinical study.

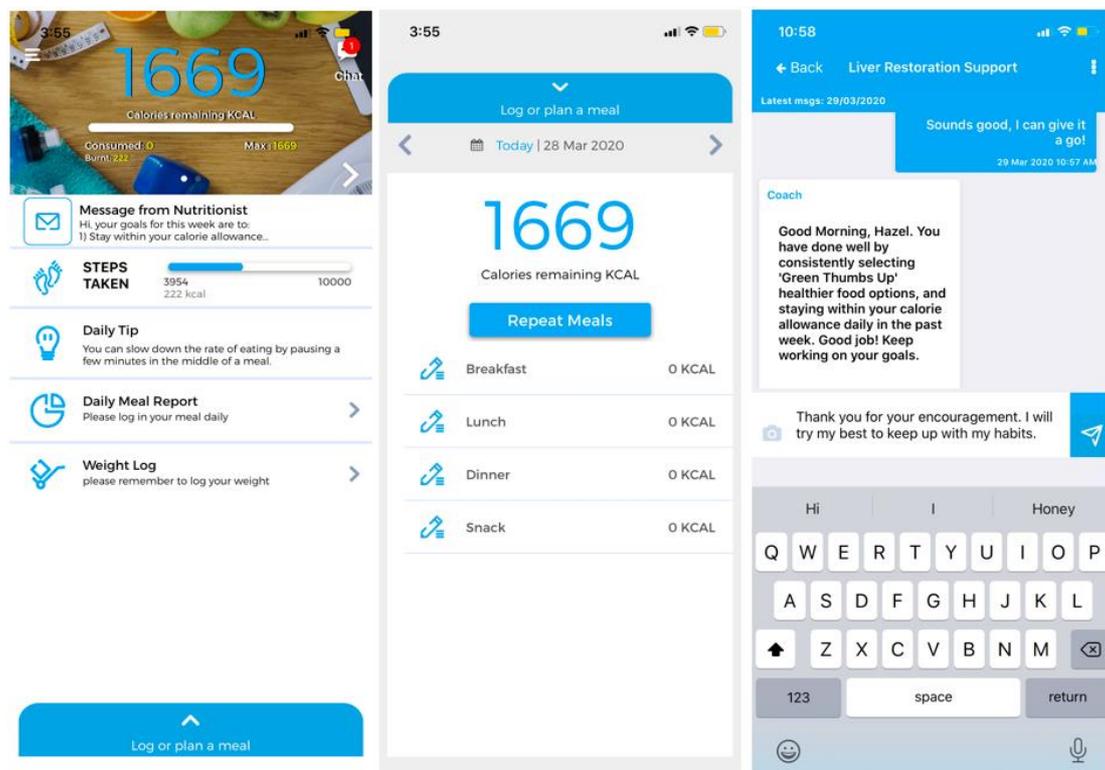
Patients recruited for the trial were randomly allocated to two groups – Group 1 comprised 53 patients who received standard care, consisting of dietary and lifestyle advice by a trained nurse, and Group 2 comprised 55 patients who were taught to use nBuddy in addition to receiving dietary and lifestyle advice by a dietitian. After six months, patients in Group 2 who used nBuddy during the trial achieved a 5-fold higher likelihood of achieving at least 5% weight loss compared to Group 1. Group 2 also showed greater reductions in weight, waist circumference, systolic blood pressure, diastolic blood pressure, alanine aminotransferase, and aspartate aminotransferase. This demonstrates the effectiveness of the mobile-app in facilitating behavioural changes.

Dr Lim said, “With COVID-19 and safe distancing measures affecting all aspects of healthcare service delivery, it may be a perfect time for healthcare professionals to promote alternative means of remotely managing our population with chronic diseases,

for example using a clinically proven mobile app, supporting patients virtually, and empowering them to self-monitor and manage their diet and lifestyle.”

The clinical study was published in *JMIR mHealth and uHealth* journal on 13 April 2020. The paper is accessible at <https://mhealth.jmir.org/2020/4/e14802/>.

About the nBuddy mobile app



Screenshot of nBuddy homepage, food log page, and dietitian support chat channel from left to right, respectively.

The app was conceptualised by Dr Lim Su Lin and developed by Verita Analytics in Singapore. nBuddy was developed using the Obesity-Related Behavioural Intervention Trials model for behavioural treatment as a framework for translating behavioural science discoveries into treatments, which is a flexible and robust process to design, conduct, and evaluate mobile app-based behavioural interventions. The app is available commercially in app stores, with basic features accessible for free. Full features of the app were made available to the intervention participants as part of collaboration between NUH and Verita Analytics.

Functions of the app

The full list of in-built functions in nBuddy represent an amalgamation of evidence-based behavioural modification strategies to promote weight loss or maintenance.

- The app includes a food diary logging system, coupled with individualised caloric goals based on the user’s age, gender, and physical activity level, allowing for self-monitoring of intake.
- An automated response system evaluates the suitability of food choices and provides instantaneous feedback, generating a list of healthier and culturally appropriate alternatives via an algorithm.
- Automatic recording of daily steps is achieved via syncing with the built-in pedometer of users’ mobile devices to enable self-monitoring of physical activity.
- The step goal increases automatically each week, from an initial goal of 3000 steps to 10,000 steps by the third week of usage. A range of physical activities can be logged manually if exercises were done in the absence of mobile devices.
- A weight logging function encourages the self-tracking of weight loss progression.
- A dashboard enables dietitians to monitor users’ input (i.e. food intake and physical activity) and progress (i.e. weight) to provide real-time feedback and encouragement.
- A peer support chat channel allows users to connect with selected family members and peers to bolster user motivation.
- A video viewing function delivers weekly educational clips.
- Daily, weekly, and monthly graph reports on weight, calorie intake, and steps facilitate the tracking of progress.
- Finally, scripted daily tips and timed automated reminders prompt users to log in daily meal intake and twice weekly weight.

Chinese Glossary

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About the National University Hospital

The National University Hospital is a tertiary hospital and major referral centre with over 50 medical, surgical and dental specialties, offering a comprehensive suite of specialist care for adults, women and children. It is the only public hospital in Singapore to offer a paediatric kidney and liver transplant programme, in addition to kidney, liver and pancreas transplantation for adults.

The hospital was opened on 24 June 1985 as Singapore's first restructured hospital. Each year, the Hospital attends to more than one million patients.

As an academic health institution, patient safety and good clinical outcomes are the focus of the Hospital. It plays a key role in the training of doctors, nurses, allied health and other healthcare professionals. Translational research is pivotal in the Hospital's three-pronged focus, and paves the way for new cures and treatment.

A member of the National University Health System, it is the principal teaching hospital of the NUS Yong Loo Lin School of Medicine and the NUS Faculty of Dentistry.