Arogya World's mDiabetes Program – Effectiveness Results

International Diabetes Federation
World Diabetes Congress Melbourne
2-6 December 2013
Poster P-1511

F. Kaufman[6,7], S. Ramalingam[1,7], L. Blais[2,7], M. Arora[3,7], H. Ranjani[4,7], K. Kahol[5,7], R. Dave[1], A. Gowda[1], N. Saligram[1,7]

1. Arogya World, India Trust and Naperville, IL, USA; 2. Department of Behavioral Sciences and Health Education, Rollins School of Public Health, Emory University. 1518 Clifton Road, NE, GCR Room 238, Atlanta, Georgia; 3. Senior Director, HRIDAY, Regd. Office: T-7, Green Park Extension, New Delhi, India; 4. Scientist & Head - Translational Research, Madras Diabetes Research Foundation & Dr.Mohan's Diabetes Specialities Centre, Chennai, Llyods Road Office, Chennai and WHO Collaborating Centre for Non Communicable Diseases Prevention & Control ICMR Advanced Centre for Genomics of Diabetes, IDF Centre for Education; 5. Public Health Foundation of India, New Delhi, India; 6. Chief Medical Officer and Vice President, Global Medical, Clinical & Health Affairs, Medtronic Diabetes, Distinguished Professor Emerita of Pediatrics and Communications, The Center for Endocrinology, Diabetes & Metabolism, Childrens Hospital, Los Angeles, USA; 7, Arogya World's Behavior Change Task ForceMedtronic, Inc., Northridge, CA

Abstract

Background: Diabetes is a huge problem in India - 60 million people live with the disease and 1 million die from it each year. Mobile phone use is widespread in the country. Arogya World's mDiabetes program evaluated the impact of mobile text messages on self-reported diabetes awareness and prevention behaviors among cell phone consumers in India. To date, little applied research has been done on the impact of mobile health messages in India to prevent diabetes.

Methods: In this population-level public health program, Arogya World worked with Emory University to develop 56 mobile text messages about diabetes and prevention through healthy eating and increased physical activity. These free text messages were transmitted by Nokia in 12 languages, twice-a-week, to 1,052,633 Indian consumers who opted into the six month program. In the pretest, 982 Nokia subscribers (experimental group) and 943 non-Nokia subscribers (control group) were surveyed. After 6 months in the post intervention phase, 992 Nokia subscribers were surveyed from the Experimental group and 953 respondents from the Control population were surveyed..
Pre-post analyses was conducted in two cohorts – Experimental (982 Nokia Life subscribers consumers with high interest in health issues and who opted to participate in the mDiabetes program) and Control (943 cell phone consumers in India that were not Nokia Life subscribers) to look at the self-reported impact of the text messages on diabetes awareness (i.e.; causes and complications of diabetes, risk factors, and attitudes), and preventive behavior (physical activity, healthy eating).

Results: Awareness about complications of diabetes increased from 34% to 59% (25%) in the experimental group, while the control group showed an increase from 44% to 55% (10%).Post-intervention analyses also indicated an increase (11%) in daily exercise in the experimental cohort from 50% to 61% while the control group showed no change. Respondents taking 2-3 servings of fruit a day increased from 34% to 49% (15% increase), while the control group increased from 32% to 33%., There was an 8% increase in the intake of 2-3 servings of vegetables a day in the experimental cohort (from 62% to 70%), while the controls group remained at 53% at the pre and post stages. All changes were statistically significant at 95% CI.

Conclusions: Exposure to mobile text messages may hold promise for influencing healthy lifestyle change for mobile phone users in India. Ongoing analyses from the data collected pre and post intervention will provide more insights into behavior change and/or intent to change. Future studies are needed to validate self-report data, explore over time the impact of continued message use and to better understand the frequency of messages need to maximally impact change in cell phone users.

Design

A total of 1,052,633 mDiabetes consumers participated across rural and urban India.

Fifty-six text messages were sent to each mDiabetes consumer in English, Hindi, or one of 10 other languages.

In the first 6 days, 1 message per day was sent. In weeks 2-26, 2 messages per week were sent.

The research study involved pre- versus Post-evaluation in experimental and control cohorts (experimental respondents were those that received the messages, while ~70% was longitudinal we still had to reach 300 respondents who were not surveyed in the prephase)

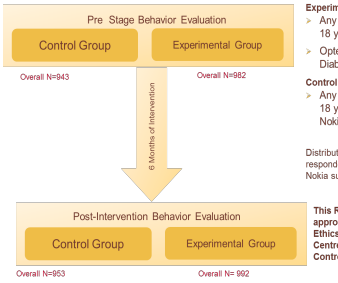
	N (Before)	N (After)
Experimental	982	992
Control	943	953

Response rate after 26 wks was:
- •Experimental – 82% of consumers were the same in pre and post phases
- •Control – 69% of consumers were the same in pre and post phases

CAVEATS:
- •Experimental Cohort was a select population of Nokia Life Consumers who opted in to the mDiabetes program and therefore a greater adherence to the program
- •Control Cohort was a random selection of mobile users (who were not Nokia phone users)

Foot note: When the Control surveys were being conducted, India was in the midst of the monsoon season and the northern states especially Uttarkhand etc. had devastating floods which increased the no-shows, dropped numbers etc.

Methods



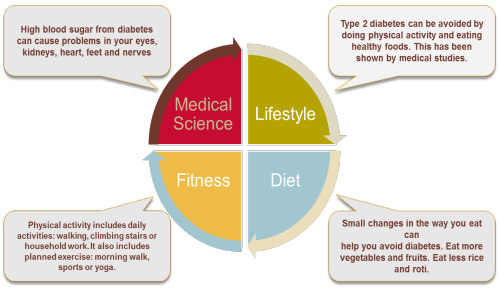
Experimental
- Any adult- male or female 18 years and above
- Opted in to Nokia Life Diabetes Service

Control
- Any adult- male or female 18 years and above not a Nokia phone user

Distribution of the respondents was per the Nokia subscriber database

This Research Protocol was approved by an independent Ethics Review Committee, of Centre for Chronic Disease Control in India

Message Content



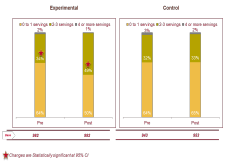
Results

Awareness of Complications

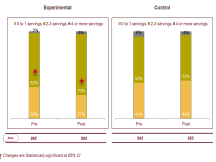
Overall	Experimental		Control	
Base: Respondents aware of Diabetes	Pre (N=663)	Post(N=687)	Pre (N=819)	Post(N=789)
Loss of Vision / Cataract	34%	61%	44%	59%
Kidney Disease	31%	57%	42%	58%
Feet diseases	36%	63%	45%	54%
Heart Failure/Stroke	34%	59%	43%	51%
Poor Wound healing / Amputation	39%	69%	53%	64%
Nerve damage	33%	53%	46%	47%
Gum diseases	29%	48%	38%	41%
Average	34%	59%	44%	53%
Net Change	25%		9%	

There was a larger increase in awareness of diabetes complications in the mDiabetes cohort (25%) than in the Controls (9%)

Dietary Habits



More mDiabetes consumers (15% more) reported having 2-3 servings of fruits daily



More mDiabetes consumers (8% more) reported having 2-3 servings of green vegetables daily

Exercise and Intent to Exercise

Overall	Experimental		Control	
Activities that consumers regularly do the following	Pre (N=982)	Post (N=992)	Pre (N=943)	Post (N=953)
You consciously tend to take stairs instead of using lifts and escalators	62%	73%	73%	71%
You tend to take short walking breaks when working in office/home	66%	79%	65%	72%
When at home, you do/help with household chores	75%	84%	74%	72%
Do all household chores such as sweeping or mopping, carrying water	53%	64%	45%	48%
You prefer to walk down small distances for daily chores	81%	88%	82%	81%
Work in the field	39%	38%	35%	24%

*Changes are Statistically significant at 95% CI

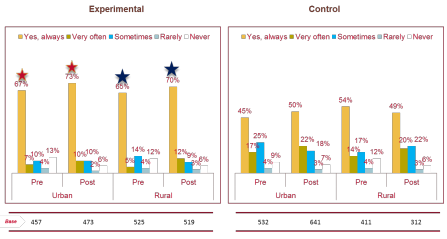
Increased activity was evident in the mDiabetes cohort

Of those who said No to exercising	Experimental		Control	
	Pre(N=489)	Post (N=388)	Pre (N=342)	Post(N=366)
Yes, in next 30 days	29%	41%	41%	36%
Yes, in next six months	9%	5%	17%	17%
Not very soon	62%	54%	42%	46%

Even among those mDiabetes consumers who said they did not exercise regularly, there was an increase in the intent to exercise

More mDiabetes consumers (14% more) reported avoiding high fat food / fried food

Base - Those who said No, they do NOT avoid eating fried food	Experimental		Control	
	Pre(N=302)	Post(N=168)	Pre(N=267)	Post (N=272)
Yes, in next 30 days	32	29	19	28
Yes, in next six months	9	11	11	15
Not very soon	59	60	69	57



*Changes are Statistically significant at 95% CI

The mDiabetes program persuaded people in rural and urban India to be careful about what they eat

Summary and Conclusions

- mDiabetes reached consumers from all over India, and impacted people in both urban and rural areas
- Exposure to mobile text messages may hold promise for influencing healthy lifestyle change for mobile phone users in India
- Because of its scalability, mDiabetes holds promise as the basis for a chronic disease prevention model
- Future studies are needed to validate self-report data, explore over time the impact of continued message use and to better understand the frequency of messages need to maximally impact change in cell phone users
- This model can be replicated for other non-communicable disease areas where mobile messaging can lead to measurable changes in behavior. This can potentially change the disease landscape at a country level