SPECIMEN FORMAT FOR THESES OF MONTH

Faculty	**:**	**School of Home Science**
Department	**:**	**Food Service Management and Dietetics**
Branch/ Area:	**:**	**Food Service Management and Dietetics**
Sub Subject Heading:	**:**	**-**
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Title of the thesis	**:**	Efficacy of a Software "*Nutra Glyx*" on Nutraceutical Recipes Incorporated with Selected Medicinal Plants for Diabetes Mellitus"
(i) In Roman Script In roman Script		**-**
Nomenclature of Degree:	**:**	**PhD**
Month & Year of Enrolment:	**:**	**Aug 2015**
Month & Year of Registration:	**:**	**Aug 2015**
Month &Year of Submission:	**:**	**Feb 2019**
Month &Year of Award	**:**	**Sep 2020**
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Abstract within 300 words:

Abstract

Background Information: Medicinal Plants are used as folk medicine in subtropical areas around the world because of its pharmacologic activities. It is believed to control the postprandial blood glucose level and is considered useful as a hypoglycemic agent in the treatment of diabetes mellitus. **Objective** of this study is to test the efficacy of a software **"*Nutra Glyx*"** on nutraceutical recipes incorporated with selected medicinal plant for diabetes mellitus. **Methodology:** A total of 340 female type II diabetic subjects between the age group of 40-45 years where selected through purposive sampling. The background information was elicited (Pretested interview schedule). The Anthropometric measurement (Height, Weight, BMI, and WHR) and dietary intake (24 hour recall) were assessed using standard tool. The fasting and Post Prandial (PP) blood glucose levels were also analyzed using standard procedure. The Medicinal Plants namely [Guava leaf (Psidium guajava L.), Long Pepper fruit (Piper longum L.), Sirukurinjan leaf (Gymnema sylvestre (Retz.) R.Br.), Naval Seed (Syzygium cumini L.), and Kandankathiri (Solanum virginianum L.)], were cleaned, washed, sundried, powdered and the extract of the Medicinal plants was obtained by dissolving 100 gram of powdered Plants in 1600ml of water, boiled at 60℃ for approximately for 2hours and reduced to 400 ml separately. The Medicinal Plants extract (Calculated Human Equivalent Dosage (Mukthar et.al., 2004) was incorporated into a portion of chapattis and was administrated to a subsample of 210 type II female diabetic for ten consecutive days. The fasting and post prandial blood glucose response before and after were recorded. **Results:** Forty two percentage of female diabetic subjects were found to be obese and BMI was normal (18-23) for 18 % of subjects. On the whole, the subjects showed significant deficit in mean nutrient intake for protein, fat, calcium, beta-carotene, Vitamin C and free folic acid when compared to the recommended dietary allowances. Chapatti incorporated with Medicinal Plants showed significant reduction in the blood glucose level at 5%level of significance. Aoftware ***"Nutra Glyx"*** on nutraceutical recipes incorporated with selected medicinal plants for diabetes mellitus is an add value addition in the dynamic of dietary management for diabetes mellitus.

Key Words: Guava leaf (Psidium guajava L.), Long Pepper fruit (Piper longum L.), Sirukurinjan leaf (Gymnema sylvestre (Retz.) R.Br.), Naval Seed (Syzygium cumini L.), and Kandankathiri (Solanum virginianum L.)], Hypoglycemia, Phenolic compounds ,Guava leaf *(Psidium guajava Linn)*, Type II Diabetes, Herbs and spices, Nutraceutical, Medicinal Plants, Software, Therapeutic diet, Dietary management.

i) Objectives

The primary objective of this study is to test the efficacy of a software **"*Nutra Glyx*"** on nutraceutical recipes incorporated with selected medicinal plant for diabetes mellitus.

ii) Hypothesis: the performance of the data base HERBA GLYX will not be an effective tool in the management of Diabetes Mellitus

iii) Methodology :

To test the above objectives, the study was carried out in four phases:

Phase I : Survey on Selected Female Type II Diabetic Subjects

Phase II : Selection of Medicinal Plants and Testing of Hypoglycemic Effect

Phase III : Standardization and Acceptability of Nutraceutical Recipes Incorporated with Selected Medicinal Plants

Phase IV : Development and Evaluation of a Software *"Nutra Glyx"* on Nutraceutical Recipes Incorporated with Selected Medicinal Plants

iv) Findings:

Phase I: Survey on Selected Female Type II Diabetic Subjects

- It is evident that 31 percent of selected type II female diabetic subjects were at the age of 41 years followed by 22 percent of them at the age of 43 years.
- It was observed that 96% of female type II diabetic subjects were house wives and only four percent were found to be employed as entrepreneur (2%) teacher (1%) and in other profession.
- Though 96% of the selected female type II diabetic subjects were found to be house wives, all the selected subjects belonged to a high income category with a monthly income of more than Rs.10,000.
- It is clear that 42 and 39 percentage of selected type II female diabetic subjects were found to be obese grade I and obese grade II respectively.
- It is clearly indicates that 90 percent of the selected female diabetics had a fasting blood glucose levels greater than 126mg/dL. Similarly the post prandial blood glucose level was greater than 200mg/dL for 90 percent of the selected female diabetics.

- Sixty nine percent of the selected female type II diabetic subjects were found to be non-hypertensive. Also 18 percent of the subjects were found to be mid hypertensive.
- It is evident that 83 percent had the habit of exercising regularly.
- Ninety seven percent of the female type II diabetic subjects were found to be non-vegetarians.
- On the whole, the selected female type II diabetic subjects showed significant deficit in the intake for energy, protein, calcium, beta-caroten, nicotinic acid, Vitamin C and free folic acid when compared to the Recommended Dietary Allowances (2017) at one percent level of significance.
- It shows the deficit intake for cereals, pulses, milk and milk products, roots and tubers, other vegetables, sugar and fat compared to the recommended intake of food groups suggested by NIN.
- A total of 67 South Indian commonly consumed vegetarian recipes were collected based on the preferences expressed by the 340 selected female type II diabetic subjects.

Phase II: Selection of Medicinal Plants and Testing of Hypoglycemic Effect

- It was observed from the table IX that Kandankathiri (*Solanum virginianum* L.) was found to have the highest calorie content (437 kcal) followed by Sirukurinjan leaf (*Gymnema sylvestre* R.Br.) (429 kcal). *Guava leaf (Psidium guajava L.)* had the least calorie content(399) compared to the other medicinal plants. Naval Seed (*Syzygium cumini L.)* had highest protein (34gm) values followed by Sirukurinjan leaf (*Gymnema sylvestre* R.Br.) (22gm) and Kandankathiri (*Solanum virginianum* L.) (21gm) and Long Pepper (*Piper longum L.) had high Vitamin A (2980.0 µgm)*.
- Also the fat content was least in naval seed (0.01gm) followed by Guava leaves (2gm). Sirukurinjan was founded to be a rich source of iron with a calculated value of 23 mg/100gm followed by Naval seed (18.30 mg/100gm). However the iron content of Guava leaves was found to be least compared to other selected medicinal plants. Likewise the dietary fiber content of Sirukurinjan was also found to be higher (13.0gm/100gm) compared to other selected medicinal plants.

- The mean organoleptic score of chapathi (table X) incorporated with *Guava leaf (Psidium guajava L.),* Sirukurinjan leaf (*Gymnema sylvestre* R.Br.) , Kandankathiri (*Solanum virginianum* L.), naval seeds extract showed no significant difference in colour, flavor, consistency and appearance in comparison to the standard chapathi, however a significant difference in taste was observed at five and one percent level of significance for chapathi's incorporated with guava leaves (Psidium guajava L.) and naval seeds respectively.
- The control meal treated diabetic subjects had higher pre and post mean blood sugar levels in comparison to the test meals among both medicated and non-medicated diabetic subjects. The traditional medicinal plant extracts containing test meals (TM1, TM2, TM3, TM4 and TM5 were found to have hypoglycemic effect in par with the antidiabetic drug glucophage though their hypoglycemic effect were significantly reduced in comparison to glucophage drug.

Phase III: Standardization and Acceptability of Nutraceutical Recipes incorporated with Selected Medicinal Plants

- A total of 335 (67X5 selected nutaceutical plants) nutraceutical recipes were developed by incorporating the fixed dosage of medicinal plant extracts.
- The mean organoleptic score of medicinal plant extracts incorporated nutraceutic recipes showed no significant difference in colour, flavor, consistency and appearance in comparison to the standard chapathi, however a significant difference in taste was observed at five percent level ($p<0.01$) of significance

Phase IV: Development and Evaluation of a Software *"Nutra Glyx"* on Nutraceutical Recipes Incorporated with Selected Medicinal Plants

- The home page of ***Nutra Glyx*** has six modules. A click on each module will take the user to the respective module namely **Module I: *"Dia-Edu"***, **Module II:** "***Health Tracker"***, **Module III:** "***Herba Treat"***, **Module IV***: "Diet Planner"*, **Module V: *"Exercise Zone"*** and **Module VI: *"Glossary".***

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