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Factors Influencing Adherence to Dietary Recommendations for the control of Diabetes Type II.

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Assessment of knowledge about benefits of Exercise for the control of Diabetes Type II.

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Background



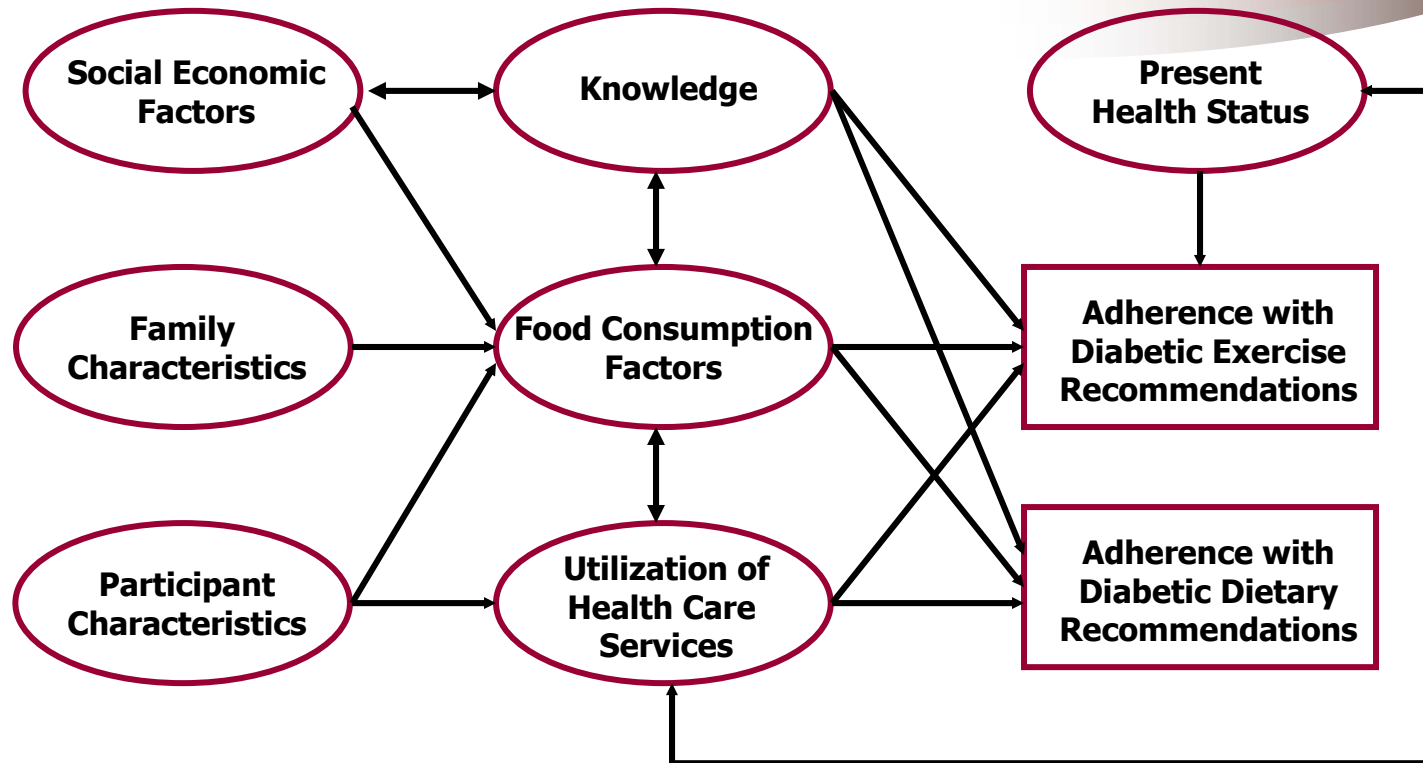
- Diabetes mellitus is a major cause of morbidity and mortality with 120 to 140 million people currently affected worldwide
- In the United States, diabetes has a prevalence rate of 4% and is the seventh leading cause of death
- Higher prevalence rates are observed in Latin America (8% in Costa Rica) and Hispanic American populations in the U.S.
- Over 90% of diabetics have type 2 diabetes
- Type 2 diabetes can largely be controlled through diet and exercise therapy
- However, diabetic morbidity and mortality remains high due to poor adherence
- Therefore, the aim of this investigation was to identify factors that influence exercise and dietary adherence

Setting



- Grecia, Costa Rica – an at risk population identified by IHCAI (International Health Central American Institute), a non-profit organization in Costa Rica
- IHCAI began an intervention program in the cantons of San Roque, Santa Gertrudis and Rincon de Salas, specifically designed to reduce cardiovascular complications associated with diabetes
- The intervention began in 2001, and consisted of weekly nutrition classes held at the local clinics (6 weeks) and the establishment of walking groups
- Our work sought to evaluate the success of this program and to address barriers to exercise and diet adherence for future improvements to the program

Model



Hypotheses



Dietary Adherence

- (1) Increased utilization of health care services yields greater adherence
- (2) Increased family support yields greater adherence
- (3) Greater outcome expectancy yields greater adherence
- (4) Greater knowledge of diabetes yields greater adherence
- (5) Greater self-confidence yields greater adherence

Exercise Adherence

- (1) Greater knowledge about benefits of exercise yields greater adherence
- (2) Increased family support yields greater adherence
- (3) Poor health yields less adherence
- (4) Increased utilization of health care services yields greater adherence
- (5) Greater knowledge of diabetes yields greater adherence

Methods: General



- Interviews with IHCAI staff about the intervention and the structure of the health care system in Costa Rica
- Interviews conducted with staff members at clinics in San Roque and Santa Gertrudis to gain understanding of the patient populations and challenges faced by diabetics
- Focus group with residents of Grecia to learn about local attitudes towards diet, exercise, and health care
- Assessment of local food availability in each canton
- Structured interviews with diabetics who participated in the intervention

Methods: Survey



- 92-item survey instrument constructed (health status, dietary adherence to the recommendations given during the nutrition classes, adherence to an exercise regimen, socioeconomic status, as well as measures of social support, self-confidence, and barriers to adherence)
- Survey translated into Spanish and back-translated for accuracy
- 24-item diabetic knowledge questionnaire utilized
- 1 hour interviews conducted in Spanish at participants' homes

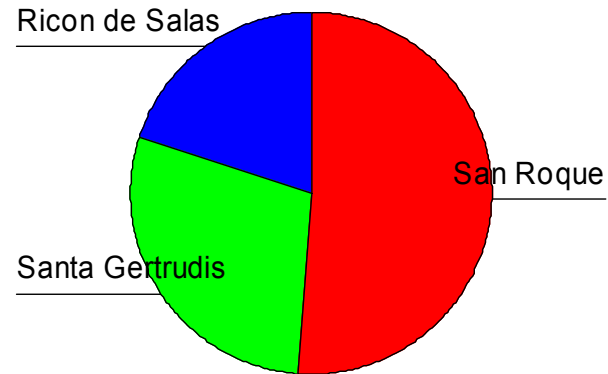
Methods: Analysis



- Data was coded and entered into Excel and subsequently analyzed in SPSS, using frequency tabulation, chi-squared tests, one-way ANOVA and Pearson's Correlations. Statistical significance was reported at a p value of $\leq .05$.
- Dietary adherence was calculated from the sum of responses for 12 questions (7 points each - days/wk recommendation followed). The sum was converted to a percentage of total possible points (0-100%), yielding the Dietary Adherence Score (DAS). High dietary adherence was considered to be a DAS of 65% or greater.
- Exercise adherence was calculated as the number of days/wk a participant exercised. High adherence considered to be 3 days/wk or more.

Results: Demographics

- 48 participants interviewed; 45 questionnaires completed
- Area breakdown of participants:
 - 23 from San Roque
 - 13 from Santa Gertrudis
 - 9 from Rincon de Salas
- Average age 58 yrs
(Range 37 –71 yrs)
- 39 females/6 males
- Average time since diagnosis of diabetes = 6 yrs
- Average education level = 6th grade



Results: Demographics



- 37 participants taking diabetic medications (10 requiring insulin)
- 14 participants reported complications as a result of their diabetes
- 75.6% of participants utilized the local EBAIS only for health care needs; others utilized both their local EBAIS and area hospitals
- 16 subjects participated in walking group sessions
- 43 subjects participated in dietary classes
- Mean diabetic knowledge score = 67% \pm 11%

Results: Exercise



- Adherence to an exercise program was not related to area, educational level, or number of years since diagnosis
- Knowledge and diet class attendance was unrelated to exercise adherence or physical activity levels
- Positive Correlations found between:
 - 1.) Exercise adherence and family support/encouragement (R= 0.299, $p < 0.046$)
 - 2.) Exercise adherence and personal belief in the importance of exercise as a measure of diabetic control (R= 0.521, $p < 0.0001$)

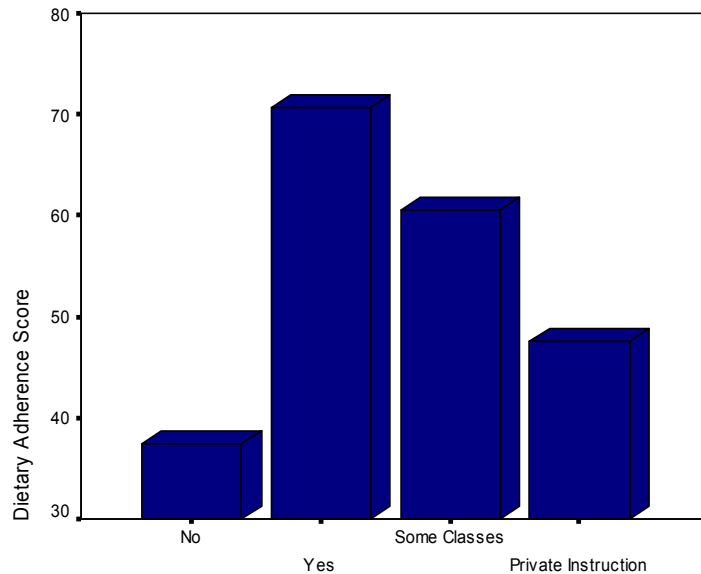
Results: Exercise



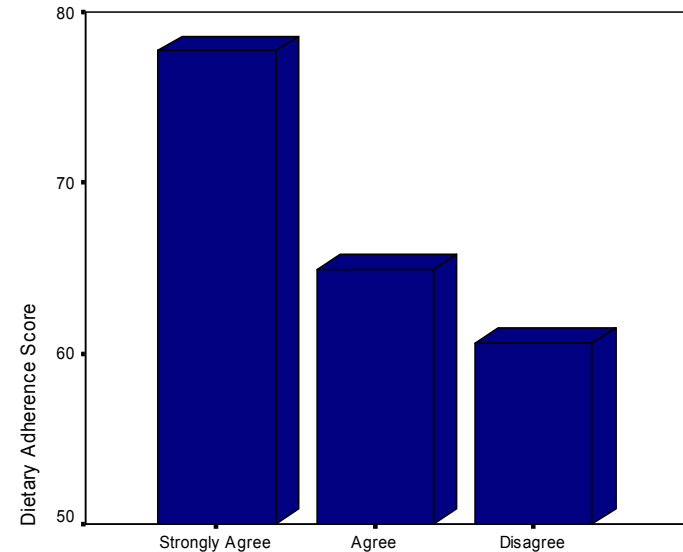
- Significant Relationships found between:
 - 1.) Exercise adherence and participation in walking group sessions ($\chi^2=12.740$, $p<0.0001$)
 - 2.) Exercise adherence and availability of a walking companion ($\chi^2 =9.054$, $p<0.003$)
 - 3.) Exercise adherence and difficulty walking, due to physical limitations ($\chi^2 =22.922$, $p<0.0001$)

Results: Diet

- Dietary class attendance resulted in higher DAS (ANOVA, $F=3.38$ $p=0.027$)
- Greater self-confidence correlated to higher DAS (PC, $R=0.347$, $p=0.021$)



Dietary class attendance



Confidence in one's ability to follow dietary recommendations

Results: Diet



- Diabetes knowledge had a positive association with DAS (PC, $R=0.313$, $p=0.039$).
- Strong distaste for recommended foods correlated to low DAS (PC, $R=0.347$, $p=0.02$).
- Individuals who received family help or included themselves as a significant dietary support had higher DAS (ANOVA, $F=2.70$ $p=0.035$)
- No correlation between dietary adherence and type of health care utilization, duration of diabetic status, ease of following recommendations, or social economic factors

Discussion: Diet



- Factors that are associated with adherence in Latin American populations include nutrition programs, diabetes knowledge, self-efficacy, family support, and desirability of food recommendations
- Higher dietary adherence could be achieved by expanding nutrition programs to include information about diabetes, structured family participation, better access to recommended foods, classroom exercises to improve self-confidence, and more satisfying and enjoyable recipes/food recommendations
- By addressing these factors, therapeutic programs may be able to largely improve adherence levels in Costa Rica as well as more generalized populations including Hispanic Americans in the U.S.

Discussion: Exercise



- Interventions must be tailored to accommodate those who work during the day or have difficulty leaving the home
- Greater focus must be placed on health status and the ability of individuals to physically participate in exercise programs
- Suitable exercises must be made available to those individuals with physical limitations
- Greater emphasis should be placed on family involvement in the management and care of a loved one with diabetes

Discussion: Limitations



- The greatest limitations of this investigation were the small sample available to study, disproportional representation of female subjects, and lack of representation of employed population. The design of the IHCAI program contributed to these limitation due to the daytime scheduling of classes.
- Also, baseline DAS, baseline exercise routines or control subjects were not used for comparison to determine if the programs directly improved adherence. This leaves to question whether it was the information and confidence gained in the program that was responsible for greater adherence or simply an individual's motivation that yielded greater adherence.
- Further study of these complex issues is required.

Sources



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