



## COMPUTER-TAILORED NUTRITION EDUCATION

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### Abstract

Imparting nutrition education using computers education is an innovative tool to motivate people to make healthy dietary changes. Computer-tailored education is a technique used for health education that is becoming popular in the changes of dietary habit research in the past few years. This computer-tailored education is now starting to be used by nutrition educators. The computer-tailored education provides participants with personal feedback about their dietary behaviours, attitudes, norms and skills while mimicking the process of "person-to-person" dietary counselling. The computer-tailored education would come in hand in health promotion planning that is identifying a health issue that is prevalent among a target audience that is serious enough to spend time, money and other resources on developing and implementing an intervention. Furthermore, identifying the risk factors for the health issue. An example where the computer-tailored education could be used by a nutrition educator would be motivating the target audience to make dietary changes such as reducing intake of dietary fat. For intervention to be effective, a target audience must be exposed to the intervention in order to have any impact. It has been proven that computer-tailored education is more effective than standard health education messages, such as brochures and videos because it is more personal and can be printed and be used to spread information. Computer-tailored nutrition information leads to better exposure. Additionally, for an intervention to succeed, the information must be comprehended well, meaning understood and cognitively processed. Computer-tailored information is more likely to be discussed with others. The computer-tailored education becomes useful in the context of especially spreading information because the lack of awareness results in the lack of need to change dietary behaviours. Therefore, the computer-tailored education technique provides feedback on the individual consumption levels and what the standard recommended levels are.

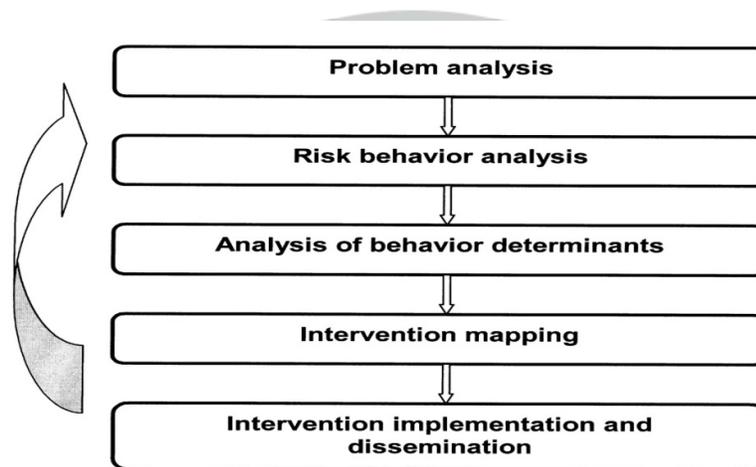
### Introduction

Computer-tailored nutrition education is an innovative and promising tool to motivate people to make healthy dietary changes. Interactive technology (eg, the Internet, the World Wide Web) offers good opportunities for the application of computer-tailored nutrition education. However, using the Web for interactive personalized nutrition education also presents new challenges. Computer tailoring is a health education technique that has become popular in dietary change research in the past decade and is now being adopted by nutrition educators (1, 2). This is not



surprising, because computer-tailored interventions have been applied and studied in relation to several health behaviours and have generally been found to be more effective than their nontailored equivalents (2), especially in promoting healthy dietary habits (3). In computer-tailored interventions, the diagnostic and educational expertise and techniques of the counsellor are documented in a computerized expert system.

- \* The first step in health promotion planning is the identification of a health problem that is serious and prevalent enough to justify spending time, money, and other resources on developing and implementing an intervention.
- \* In the second step, the specific behavioral and environmental risk factors for the health problem of interest should be identified, as should the groups who are exposed to these risk factors.



**Figure 1. A Model For Planned Health Promotion.**

- \* The third step in planned health promotion is to investigate the psychosocial and environmental determinants of exposure to risk factors. This planning phase should identify as precisely as possible why people in the target population engage in risk behaviour. In relation to a nutrition behaviour, the determinant analysis should, for example, point out why people eat too much saturated fat and whether these determinants differ in relation to such factors as sex, age, and education.
- \* In the next planning phase, health education methodologies and intervention techniques should be selected and translated into specific intervention activities to address the relevant determinants that can mediate the targeted behaviour changes. Because diet-related health risks, such as risk for cardiovascular disease and diabetes, are prevalent among many population segments, many people need to be addressed with interventions aimed at prevention.



### **Tailored Nutrition Education**

Tailored health education brings in individualization and personalization of health education based on sociodemographic, behavioural, motivational, and psychosocial as well as physical characteristics (1). This concept, which is also being used in the field of product marketing, has been called “mass customization” and “relational marketing.” It has been made possible in recent years by the ability of companies to produce and tailor advertising based on vast amounts of data regarding customer demographics, preferences, and buying habits. [6] proposed a secure hash message authentication code. A secure hash message authentication code to avoid certificate revocation list checking is proposed for vehicular ad hoc networks (VANETs). The group signature scheme is widely used in VANETs for secure communication, the existing systems based on group signature scheme provides verification delay in certificate revocation list checking. In order to overcome this delay this paper uses a Hash message authentication code (HMAC). It is used to avoid time consuming CRL checking and it also ensures the integrity of messages. The Hash message authentication code and digital signature algorithm are used to make it more secure . In this scheme the group private keys are distributed by the roadside units (RSUs) and it also manages the vehicles in a localized manner. Finally, cooperative message authentication is used among entities, in which each vehicle only needs to verify a small number of messages, thus greatly alleviating the authentication burden. In health education, tailoring has been defined as “any combination of information or change strategies intended to reach one specific person, based on characteristics that are unique to that person, related to the outcome of interest, and have been derived from an individual assessment”. A tailored nutrition education intervention would be:

- a combination of nutrition information or dietary change strategies;
- aimed at a specific person;
- based on this person’s dietary habits and/or stage of change and the determinants of these habits; and
- assessed for this person in particular.

This is, of course, what many nutrition counsellors do every day. However, personal counselling is too time-consuming and therefore too expensive to apply for every individual who, for example, has a diet high in saturated fat or low in fruits and vegetables. Today it is possible to apply tailoring by using interactive technology, which makes personalization of nutrition education applicable to large groups of people at relatively low costs. This is what is referred to as computer tailoring. In computer tailoring, the nutritional and educational expertise of a nutrition counsellor, or even better, the combined expertise of many counsellors, is translated to a series of “if then” statements and as such documented in an expert system. After a computer-tailored nutrition education system has been developed, it can be applied and distributed relatively independently of nutrition education expertise. In other words, computer-tailored systems make distribution of expert advice possible for nonexpert intermediaries, or without any intermediaries.



## COMPUTER TAILORING

The process of computer tailoring attempts to mimic the process of personal counseling: people are surveyed or interviewed, and the results are used to develop individualized feedback and advice. In the computer-tailored interventions developed to date, the survey is generally self-administered or administered by telephone, and the survey results are keyed or automatically scanned into a data file. The tailoring expert system analyses these data and links them with a feedback and advice source. This feedback source is a message library or archive that contains appropriate feedback and advice for each survey response. The survey is to provide the “diagnosis” for the individual feedback and advice, and should therefore be aimed at assessment of the variables that are important for inducing dietary change, an assessment for which only valid and reliable measurement tools should be used. In a comprehensive review of the effectiveness of nutrition education, Contento et al concluded that nutrition education was more likely to lead to healthier diets if more of the following prerequisites were met:

- Nutrition education should be tailored to motivators and reinforces that are personally relevant to the people in the target group.
- Nutrition education should apply personalized self-evaluation and self-assessment techniques.
- People in the target group should be able to participate actively in the nutrition education intervention.

As stated above, computer tailoring enables the application of these important health education methodologies and techniques to dietary behaviour change. It has indeed been established that computer-tailored nutrition education is perceived to be more personally relevant and that perceptions of personal relevance are positively associated with the impact of computer tailoring. The combination of greater effectiveness than general health education and the possibility of reaching larger numbers of people than interpersonal counselling makes computer tailoring a promising technique worthy of much further research. Further research is also needed to explore the opportunities for tailoring to multiple health-related behaviours, based on different sources and/or communicated through different channels. Most studies on computer tailoring to date have investigated the potential of interventions aimed at changing one health-related behavior. Computer-tailored interventions have been tested, for example, to encourage people to eat less fat, to stop smoking, to be more physically active, to participate in breast cancer screening, to encourage organ donor registration, or to seek protection from the sun .

## CONCLUSION

Computer tailoring is currently one of the most promising and innovative approaches in nutrition education. Better exposure and more intensive cognitive processing as a result of individualization and the self-evaluation properties of computer tailoring have been proposed as important causes of the effectiveness of computer-tailored nutrition education. However, little is



known to date, and more research is needed about when, why, where, and for whom computer-tailored nutrition education is effective.

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