

# A REVIEW ON IMPACT OF INTERNET ON PHYSICAL ACTIVITIES

Dr. Pratibha Verma, Assistant Professor, Department of Management, Galgotias University

## ABSTRACT

People are now strongly encouraged to become more physically active. The Internet is a powerful tool for changing the behaviour of physical activity. However, the evidence concerning such internet-based interventions is unknown. The aim of the study was to systematically evaluate the methodological quality and the efficiency of interventions to support physical activity through the Internet, as randomised controlled trials have assessed. The PubMed, Web of Science, and Cochrane Library databases conducted a literature search by July 2006. Only randomised controlled trials were included describing the effectiveness of an internet-based intervention, one of their major objectives being the promotion of physical activity among adults. Data collected included the source and year, country of origin, targeted health behaviours, characteristics of the participants, intervention characteristics, and efficacy figures. The methodological quality was also evaluated. There is evidence that physical interventions based on the Internet are more effective than a strategy for waiting lists. There remains to be established the added value of specific components of physical activities on the Internet, such as increased supervisor contact, tailored information and theoretical loyalty. The methodological quality and the type of outcome of physical activity measure varied, stressing the need for these measures to be standardised.

**Keywords:** Internet, Physical Activity, Review

## INTRODUCTION

Less morbidity and mortality in cardiovascular disease[1-4], diabetes mellitus[5], cancer[6], and osteoporosis[7] are associated with regular physical activity. Notwithstanding these well-established health benefits, most adults in Western countries do not meet the physical activity public health recommendations [8-12]. Therefore, effective interventions are needed to influence the behaviour of physical activity positively.

Most physical activity interventions traditionally use face-to-face delivery methods (eg, individual consultations or group meetings). In a number of systematic reviews [13-18] their primarily short-term effectiveness has been extensively documented. In addition, these reviews showed that several methodological weaknesses are present in many physical activity studies. The main methodological weaknesses identifiable in these reviews include the use of physical activity measures without data on validity/reliability, exclusive retention on self-reporting measures, insufficient control of confusion factors, small sample sizes, lack of follow-up data and low follow-up rate.

## USE OF INTERNET

With the number of persons who are quickly accessing and using the Internet[19], the Internet is increasingly being used as a mode of delivery for programmes for physical activities. The strength of physical activities based on the Internet lies in the fact that a large number of people can be reached with this mode of delivery at a lower cost than with face-to-face operations [20]. In addition, through the Internet, participants can access large amounts of information and choose when they want to interact and receive information[21]. Previous reviews on the effectiveness of web-based physical activity interventions have shown that the Internet can in fact be a promising way to intervene on physical activity [20-24]. The majority of these reviews must be updated, however, since they included studies conducted between 2000 and 2003. This is all the more important since previous reviews primarily included observer and anecdotal studies, while in recent years there have been a number of randomised controlled trials. In addition, in reviews which were directed exclusively to online interventions, specific methodological characteristics of physical activity studies such as the measurement of physical activity have not yet been addressed.

## REVIEW METHODS

This review thus seeks to systematically evaluate, through randomised controlled trials, the methodological quality as well as the efficacy of interventions designed to promote physical activity on the Internet. The number of randomised controlled trials on the efficacy of physical activities based on the Internet is limited. This review is the best evidence to date. Two independent investigators evaluated all articles and abstracts, reaching a consensus on the inclusion of studies and data extraction. Three studies have been investigated to determine whether an intervention based on the Internet is more efficient than a waiting list. Two of these studies have shown a significantly larger increase in Internet physical activity. In four studies two types of online intervention were compared, the most important difference being the amount of contact with the supervisors between the intervention group and the control group. Of these studies, only one reported significant differences in physical activity change between the two interventions. However, the amount of personalised supervision in this study was not the only difference between intervention and control groups.

The methodological quality of the selected studies varied. Only half of the 10 studies were considered to have a good methodological quality. The most important reasons for the low value on methodological quality were lack of information on the blinding of the results assessor, no description for sample size calculation and an insufficient description of the randomization and concealment method. This could have influenced the results of the studies because it has been shown that inadequate methodological approaches are associated with bias in controlled trials, particularly those that constitute poor concealment[44]. In addition, none of the studies used an analysis of intention to treat. However, in most physical activity studies, the full application of the intent-to-treat model according to the definition given by Hollis and Campbell[38] may not be possible because, in most of such studies, there will be at least a few topics who will not pass final assessments or change their residence.

Furthermore, we have evaluated the quality of the studies by assessing whether the interventions fulfilled criteria, including intervention measures, process measurements and outcome actions for Internet physical activity interventions in particular. In six studies, one or more theoretical models were used by researchers to compose interventions. The transstheoretical model and the social cognitive theory were the two theories most commonly employed. This review could not demonstrate that interventions based on theory and physical activity carried out on the Internet are more efficient than interventions based on non-theory. Although there are evidence that interventions incorporating these models are effective in raising the levels of physical activity[45-47], this effectiveness remains questioned by other researchers[48]. More research is needed on the surplus value of these models in promoting complicated health behaviours such as physical activity.

## CONCLUSION

The results also show that most studies used a single outcome measure of physical activity and objective measures such as activity surveys or pedometers were rarely used. In order to better determine the influence of physical activity interventions based on the Internet, future studies should include several outcomes of physical activity, preferably accompanied by one or two objective measures. Moreover, physical activity results measures need to be more uniform, in our review studies have reported results in time, energy expenditure, or categorical variables, such as proportions of persons meeting the recommendations of physical activity.

On the basis of the above results, we conclude that there is evidence that interventions based on the Internet are more effective than a group of waiting lists. In relation to which components are the key components (i.e., contact quantity or treatment type), the evidence is scarce.

Several factors could have contributed to the limited evidence of efficacy. First, there was a limited number of eligible studies. The Internet is a relatively new tool for interventions in physical activity. In addition, many of the interventions that used the internet to deliver the programme did not report the results of changes in the level of physical activity, but employed indirect measures such as phases of motivation readiness, weight changes, heart rate or maximum oxygen consumption. Our review included three studies that considered secondary results for changes in physical activity levels; these interventions were not mainly intended to change the behaviour of physical activity. All three of these studies compared two different types of Internet intervention.

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