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The Current State along with Outstanding Issues Related to Email-Based Guidance by Physical Therapists Aiming to Prevent Low Back Pain among Workers

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Abstract

Low back pain (LBP) is more likely than any other symptom to prevent people from working, making the establishment of measures to prevent and reduce LBP vital in the workplace. In our previous study, we have conducted Physical Consultant research (PCo research) in order to verify the effect of email-based guidance provided by currently working physical therapists (the advisors) to workers (the clients) in preventing LBP. We found a significant improvement of Work Ability Index and Fear-Avoidance Beliefs Questionnaire among the clients in the PCo research. The purpose of this study was to consider means of improving the effective-ness of email-based guidance using computers and mobile terminals. The method involved the use of a PCo research database, with the results of the questionnaire survey carried out among advisors and clients analyzed once the study was completed. The results revealed that one advisor can receive and respond to questions from five clients at any one time. Questions from the clients included not only those related to LBP prevention, but also some related to other musculoskeletal symptoms, general lifestyle, and care for family members. We thought that the physical therapists are the profession most likely to be able to respond to such questions. The development of a dedicated system will be required in order to manage data from multiple clients and implement efficient and effective email-based guidance.

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-Key words-Physical therapist, Low back pain, Occupational health

Introduction

In Japan, from April 2008, medical insurers have been required to execute specific health examinations and offer specific health guidance (Specified Health Examinations and Guidance) focusing on visceral fat accumulation¹⁰. The subjects from 40 years old to 74 years old are categorized based on the results of examinations and questionnaires, according to their level of risk, into those requiring "motivational support" and those requiring "proactive support", with Specified Health Guidance provided depending on these categorizations. "Proactive support" is provided among individual in one format from interview, telephone, letters and electronic communication (fax and email, etc.), or as a combination of these.

In the field of research into physical activities, measures offering support for physical activity have also been provided by the use of mobile phone messaging³. Furthermore, trials using emails have begun in walking programs in occupational health³. We have already noted the short-term effects of guidance and support in im-

proving physical activity when provided by mobile telephone message to healthy young people, and provided by an electronic communication including mobile telephone message to healthy elderly people⁴⁶. Yamatsu, et al. reported that the short-term success rate of intervention in physical activity using the internet and mobile phone terminals is at least 50%⁶. However, the long-term benefits of intervention in physical activity using the internet and mobile internet and mobile terminal devices are unclear, and the study of its long-term impact, including the development of a methodology for effective intervention, is an issue for the future. While the long-term effects of intervention are still an issue for future consideration, it is considered to be an "effective tool for promoting changes in peoples' behavior"-which is also part of the current Specified Health Guidance.

In Japan, it has been found that 60% of workplace-related illnesses are due to low back pain (LBP)⁷, of which 85% is in the form of Non-Specific LBP (NSLBP), with no specific cause⁸⁹. It has also recently been clarified that psychological and social factors also contribute to NSLBP and that the provision of correct information and an encouraging attitude among those around the subject can contribute to relief from LBP¹⁰. In terms of preventing LBP, the effect of guidance using electronic communication was not examined. In our previous study, we conducted a Physical Consultant research (PCo research) in order to verify the effects of email-based guidance provided by physical therapists (the advisors) to workers (the clients) in preventing LBP among workers who had in the past suffered from NSLBP¹⁰.

In the present study, we used a database of PCo research and analyzed the results of a questionnaire conducted among advisors and clients once intervention had ended, in order to consider a more effective means of email-based guidance using computers and mobile terminal devices.

Methods

Definition of PCo research

This research project was conducted between June 2013 and February 2014, with the aim of verifying the effectiveness of email-based guidance aiming to prevent LBP among worker, and from this, propose a new business model for the utilization of physical therapists in the field of occupational health¹¹). Fig. 1 shows a flow chart of the PCo research. The project allocated 20 currently working advisors with a minimum of three years' of clinical experience to 20 clients, for the purpose of the advisors providing individual guidance on how to prevent LBP by email. Two of the physical therapists who had experience providing advice regarding the prevention of LBP in worker, compiled a basic concept¹² for the prevention of LBP, with consultations and the content of guidance stored and shared via the cloud computing network at the research secretariat. The email-based guidance intervention was conducted for six months, during which time advisors sent a minimum of eight emails to clients. Moreover, in addition to the regular emails from advisors, the advisors also responded to queries from their clients.

The results of PCo research showed a significant increase in the Work Ability Index (WAI)¹³ which is used to express how skillfully each client is engaging in his/her tasks, along with a tendency towards improvement within the Fear-Avoidance Beliefs Questionnaire (FABQ)¹⁴ which expresses the subject's state of mind in regard to avoiding the fear of LBP, subsequent to the email-based guidance. In the present study, the Helsinki Declaration was fully adhered to in the use of the PCo research database and no individuals were identified.

Details of the questionnaire

The questionnaire was conducted after completion of the email-based guidance intervention. Questions asked to advisors included: "1) Did you need personal information about the client? (Y/N)"; "2) Number of days taken for the advisor to respond to a question from the client (No. of days)"; "3) Time spent on forming a response by the advisor to a question from a client (No. of minutes)"; "4) Number of responses by email by client to advisor (No. of responses)"; "5) Ideal amount of time spent by advisor in order to come up with a response to a question from a client (from the advisor's perspective) (No. of minutes)"; "6) Details of questions not related to LBP"; "7) No. of clients it would be possible to respond to in one month (No. of responses)"; and "8) Problems with the PCo research (from the advisor's perspective)". Questions 6) and 8) required a free response.

Questions asked to clients included: "1) Do you think that the advice provided by your advisor in emails was helpful in preventing LBP? (Y/N)"; and "2) Would you like to use email-based guidance again? (Y/N)".

The physical therapists dispatched by the research secretariat implemented a lecture for 90 minutes in regard to the prevention of low back pain for company employees. At this time, an explanation of the Physical Consultant research (PCo research) was provided orally, with those giving consent appointed as subjects (clients).

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Clients who gave their consent were allocated to a responsible physical therapist (advisor), in regard to whom, the clients' personal information was not disclosed. Personal information about the advisors was also not provided to the clients.

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Outline of Email-based guidance							
Period	No. of times*	Advisor	Client				
Start	1 st time						
Two weeks	2 nd time		Receives email from advisor, and sends questions to advisor.				
First month	3 rd time						
Second month	4 th time	Advisor sends email to client,					
Third month	5 th time	providing guidance based on					
Fourth month	6 th time	questions submitted by client.					
Fifth month	7 th time						
Sixth month	8 th time						
		\downarrow	\downarrow				
		Survey on completion*1	Survey on completion*2				
		Research secretariat implements	Research secretariat implements				
		questionnaire survey in regard to	questionnaire survey in regard to				

Fig. 1 Physical Consultant Research Flow Chart

clients, in order to ascertain

effectiveness of email-based

guidance.

advisors in order to analyze issues

related to the email-based

guidance.

Advisors: Physical therapists, Clients: Worker, Research secretariat: the Japanese Study Group of Physical Therapy in Occupational Health.

No. of times *: Basic number of times emails sent to clients by advisors. If the client asks questions, the number of times emails and responses are sent may increase based on the details of the advice sought and provided.

Survey on completion*: Data from both surveys on completion (1 and 2) implemented in regard to advisors and clients was utilized in this study.

Questions 3) and 5) for the advisors were compared using the Mann-Whitney U-test. The statistical software used was IBM SPSS Statistics ver. 19, with statistical significance defined at 5%.

Results

The results of the questionnaire survey conducted in regard to advisors are shown in Table 1. Since questions 6) and 8) required a free response, similar responses were compiled and the record shows responses in the order of popularity. No significant difference was between "Time spent on forming a response by the advisor to a question from a client" and "Ideal amount of time spent by advisor in order to come up with a response to a question from a client" (questions 3) and 5)).

The results of the questionnaire survey conducted in regard to clients revealed that 88% responded "Yes (it was helpful)" to the question "Do you think that the advice provided by your advisor in emails was helpful in preventing LBP?", and 76% responded "Yes (would like to use again)" in response to the question "Would you like to use email-based guidance again?"

	Question	Response		
1	Need for personal information about the client	All advisors required personal information from their clients		
2	Time taken for the advisor to respond to a question from the client	2.0±0.4 days		
3	Time spent on creating a response by the advisor to a question from a client	22.0 ± 9.7 minutes		
4	No. of responses by email by client to advisor	4.7 ± 4.2 times		
5	Ideal amount of time spent by advisor in order to come up with a response to a question from a client	20.3 ± 13.7 min.		
6	Questions related to topics other than low back pain	Stiff or painful shoulders: n = 2 Chills: n = 1 Stiffness upon waking in the morning: n = 1 Care for family members: n = 1 Obesity: n = 1 Lack of exercise: n = 1 Lower extremity pain: n = 1		
7	No. of clients it would be possible to respond to in one month (from the advisor's perspective)	5.3±7.4 people		
8	Problems with the PCo research (from the advisor's perspective)	Need subject's information in advance: $n = 4$ Not clear whether or not client has seen email: $n = 2$ Need guidelines and examples for composing emails: $n = 2$ Need to decide how to follow-up if client does not respond: $n = 2$ Not clear if information being provided is what client requires: $n = 1$ Difficult to tell whether guidance is effective: $n = 1$ Differences in advice given by different advisors; this may cause dissatisfaction among clients: $n = 1$ Confused about what to do when clients do not respond: $n = 1$ Difficult to build trust with client due to anonymity: $n = 1$ Need for quantitative data and tools that allow for shared aware- ness between client and advisor: $n = 1$		

 Table 1 Results of Questionnaires given to Advisors

Discussion

In the present study, we used a database of information from past PCo research and analyzed the results of a questionnaire conducted among advisors and clients once intervention had ended, in order to consider a more effective means of email-based guidance using computers and mobile terminal devices.

In the PCo research, we took care to ensure that the advisors could not identify the clients and that the clients could not identify the advisors even after the study ended. The results of the questionnaire implemented on advisors showed that all advisors stated they required personal information from clients in order to provide email-based guidance. In the field of physical activity research it has been reported that the greater the relevancy of messages sent to subjects in support of physical activities, the more likely it is that the message will be received and acted upon¹⁵. Obtaining personal information about the client is considered to facilitate the provision of guidance that is more relevant to factors in the client's background. As such, disclosure of personal information is an issue that requires more consideration. During the PCo research, a unified concept of guidance to prevent LBP¹⁰ was provided; however, if intervention is to be considered in indeterminate multiple cases, even if personal information is not available. It will be necessary to compile a manual for email-based guidance methods to ensure a smooth response. Guidance for prevention of LBP needs to include guidance related to physical activity and exercise, as well as provisions for psychological and social factors such as FAB¹⁰. When giving individual advice, it is easy to respond to individual psychological and social factors. However, when giving guidance to a group, it is more difficult to focus on individual psychological and social factors, and as such, is an issue that will require consideration in the future.

The results of the questionnaire survey showed that the average ideal amount of time required by advisors in order to come up with a response to a question from a client was 20.3 ± 13.7 minutes, while the time taken to respond was in fact 22.0 ± 9.7 minutes. There was no significant difference noted between the two, in-

dicating that advisors were able to reply within their ideal time limit. When asked how many clients they could handle per month, the average response was diverse at 5.3 ± 7.4 ; however, it was believed that the group of currently active physical therapists in this study could manage email-based guidance with around 100 clients at any one time. Clients asked for advice on a diverse range of issues other than LBP, including other musculoskeletal symptoms, general lifestyle, and care for family members. It is thought that it would be difficult for people other than physical therapists, who have anatomical, physiological and other types of medical knowledge, as well as experience with rehabilitation, etc., to respond to medical and caregiving problems, to respond to these questions, and as such, there is a great need for physical therapists to act as advisors. The period of time taken for advisors to respond to clients was on average 2.0 ± 0.4 days, although confirmation of whether or not this was an acceptable period of time for clients was not carried out. Furthermore, advisors sent a minimum of eight emails to clients, with an average number of responses from clients of 4.7 ± 4.2 , and it is not known whether the details of the emails sent were highly satisfactory or not. In a previous survey of 844 patients currently attending orthopedic clinics for treatment of chronic LBP, patients were asked to rank their "satisfaction with their current improvement in pain level" on a Rickert scale of 1 to 11; wherein, while the average response was 5.3, as many as 27% of respondents stated that they had "given up hope of any further relief" when asked "How much relief do you expect to gain from further treatment?"¹⁷. In this research, 88% of clients responded in the questionnaire that they felt the email-based guidance had been useful in preventing LBP, while 76% stated that they would like to receive further guidance. It should be noted in comparison that in prior research¹⁷, although subjects were patients attending clinics, it is believed that this still represents a high level of satisfaction among clients with the email-based guidance.

In the future, in addition to considering the effectiveness of email-based guidance in research with regulated methodology, it is necessary to consider how to implement even more effective email-based guidance. The PCo research looked at 20 clients and the research secretariat was able to ascertain the content of emails between advisors and clients; however, when considering a response to a much larger number of clients, along with the development of advisors, it is believed that the development of a dedicated system will be required. Furthermore, cost/benefit analysis of email-based guidance must be carried out in order to acquire results that can demonstrate to corporations and clients the specific benefits of such a system.

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腰痛予防を目的とした理学療法士によるメール指導の現状と課題

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腰痛は、最も仕事に支障をきたしやすい疾患であり、いかに腰痛を予防し減らしていくかという職場での対策の確立 が不可欠となっている. 我々は以前に、労働者(以下,相談者)の腰痛予防を目的として理学療法士(以下,指導者)に よるメール指導効果を検討するために Physical Consultant 研究(以下, PCo研究)を実施した. PCo研究では、相談者 の労働能力適応指標および腰痛恐怖回避思考の有意な改善を認めた. 本研究の目的は、コンピューターや携帯端末機器 を使用したメール指導に関して、より効果的な方法を検討することである. 方法は、PCo研究のデータベースを用い、 この研究で行われた指導者と相談者へのアンケート調査結果を分析することとした. 結果、1 人の指導者が同時期に5 名の相談者の相談に対応可能なことが明らかとなった. 相談者からは、腰痛予防に関連する内容だけではなく、他の筋 骨格系の問題、生活習慣や家族の介護に関する相談があった. 理学療法士は、これらの相談に対応できる最適な職種と して考えられた. より多数の相談者および効果的なメール指導を行うにあたっては専用のシステム開発が必要と考えら れた.

利益相反:利益相反基準に該当無し

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