Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.
Prevention and Rehabilitation

Knowledge, attitude and practice of physical activity promotion among physiotherapists in India during COVID 19

Radhika Aditya Jadhav , Garima Gupta , Megha Nataraj , G. Arun Maiya *
Centre for Diabetic Foot Care and Research, Department of Physiotherapy, Manipal College of Health Professions, Manipal Academy of Higher Education, Manipal, 576104, Karnataka, India

1. Introduction

The global outbreak of coronavirus disease (COVID-19), which was declared a pandemic by the World Health Organization (WHO), has imposed significant health system challenges worldwide. To counteract the epidemic and maintain social distancing, India's Government also initiated a nationwide lockdown. Both COVID-19 pandemic and nationwide lockdown caused a massive impact on India's lifestyle (Shajith Anoop, 2020). Staying at home for an extended period increases the sedentary time and physical inactivity. A recent cross-sectional survey of the Indian population showed that only 17% of people were engaged in moderate to vigorous physical activities daily during COVID-19 lockdown (Nilima et al., 2020). Physical inactivity is the most common cause of poor health and the fourth leading cause of death worldwide (World Health Organization, 2010). It leads to an increase in the prevalence of non-communicable diseases. However, physical inactivity is a modifiable risk factor that can effectively curb the growing burden of chronic diseases (Nathan et al., 2017). Any amount of physical activity (PA) provides a significant health...
benefit to people of all ages and abilities (Bull et al., 2020). However, a physically inactive individual fails to complete 150 min of moderate physical activity or 75 min of vigorous physical activity or an equivalent combination of moderate to vigorous physical activity (MVPA) for a week (World Health Organization, 2010).

Public awareness of PA benefits is inadequate in India (Veluswamy et al., 2014). In such a scenario, there is a need to increase the awareness on PA benefits to reduce lifestyle diseases. Health professionals can play a crucial role in the achievement of PA promotion. Physiotherapists are essential health professionals involved in promoting PA (Verhagen and Engbers, 2009).

PA promotion is a multicomponent assignment that must include the knowledge of PA guidelines and PA assessment. Studies suggest that physiotherapists lack updated PA guidelines (Lowe et al., 2017; Yona et al., 2019). Interestingly, few medical schools in the UK have eliminated the fundamental teaching element on physical activity guidance (Weiler et al., 2012). International literature suggests a lack of PA promotion is multi-causative and may differ among countries (Lowe et al., 2017; Tuna et al., 2020; Yona et al., 2019). Physiotherapists play a crucial role in PA promotion, but lack of updated knowledge leads to lesser and inefficient promotion in their clinical practice (Barrett et al., 2013; Lowe et al., 2017; Tuna et al., 2020; Yona et al., 2019). Physically active physiotherapists have a significant role in promoting PA than their inactive counterparts (Tuna et al., 2020).

Even though PA has benefits, its knowledge, attitude, assessment, and promotional practices among physiotherapists in India have remained unexplored. Thus, the present study aimed to explore PA’s knowledge, attitude, and practice in India’s routine physiotherapy practice. The study objectives included assessing knowledge of WHO physical activity guidelines, physiotherapists’ attitude towards involvement in physical activities, and practicing routine physical activity assessment and its promotion.

2. Methods

**Study design:** The procedure of conducting and reporting this cross-sectional survey study was as per “The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement” (von Elm et al., 2008).

2.1. Study setting

**Ethics:** Institutional ethics committee approved this study (IEC No. 867/2019). Data collected after that through an online tool; however, participation in the study was voluntary. The investigators priory informed the scope and objectives of the study. Participants filled the study questionnaire only after consent for the study.

**Study duration:** Online data was collected in India’s lockdown period, from April 1, 2020, and the last response was accepted on 30th June 2020.

**Survey tool:** The study tool was prepared using Google form. The survey consisted of sixteen questions and demographic details of respondents. The investigators designed a questionnaire to focus on knowledge, attitude, and practice of PA promotion among physiotherapists in India. All items were close-ended or multiple-choice questions to avoid self-bias. At some places, the investigators provided the choices of multiple answer selection. Before starting the study, subject experts validated the questionnaire. (Detailed questionnaire have provided in Supplementary file 1). Investigators performed pilot testing on ten participants and extensively promoted the survey. The major promotion was on physiotherapy social media groups and registered Indian physiotherapist networks.

**Participants:** Study participants were physiotherapists with a minimum of a bachelor’s degree qualification and practicing in India. The participants were selected randomly among registered physiotherapists. Investigator excluded the responses from students and non-working physiotherapists from the analysis.

**Variables:** The questionnaire had sixteen questions. Knowledge of WHO PA guidelines, physiotherapists’ attitude, and assessment and promotion practice of PA was the study’s primary outcomes. WHO PA guideline 2010 was the baseline for the survey questionnaire.

1. **Knowledge:** The investigators assessed the knowledge using five questions (Q. 1 to 5). Two questions were targeted on the awareness of PA and inclusion of PA as a part of the physiotherapy curriculum. Three questions were intended to explore the knowledge of WHO PA guidelines on moderate activity, vigorous activity, and strengthening.

2. **Attitude:** The attitude section consisted of five questions (Q. 6 to 10); intended to assess the physical activity profile of physiotherapists. Investigators also investigated their perspective towards the importance of PA promotion, and willingness to learn more about PA was also investigated.

3. **Practice:** PA practice trends among physiotherapists in India were assessed by six questions (Q. 11 to 16). These questions intended to analyze routine clinical practice on assessment and promotion of PA, common approaches of PA assessment and promotion, and barriers while promoting PA. The respondents were allowed to choose multiple answers to three questions related to assessment and promotion strategies.

2.2. Data measurement

The investigators considered the responses in questions related to WHO PA guidelines (Q. 3, 4, 5) to measure the knowledge. Investigators estimated the correct response in individual items as well as in all three questions. In the attitude measurement, the investigators viewed the physical activity profile of respondents (Q7). Respondents with PA of 150 min or more per week were considered to have an appropriate attitude. Investigators considered responses in Q. 12 and Q. 14 to measure PA assessment and promotion practice, respectively.

**Study size:** The survey was circulated among 520 physiotherapists randomly, from which 185 responses were received. The response rate was 35%. Investigators excluded fifteen reactions as they were students (n = 10) and were not practicing in India (n = 5). In the final analysis, the investigators also included the responses from pilot testing. The final sample size of the study was 180.

2.3. Statistical method

All responses were verified and downloaded in Microsoft excel. The data then exported to EZR software for analysis. Demographic data were analyzed using descriptive statistics and reported as mean and standard deviation (SD). Frequencies are stated in percentage value. The investigators examined the promotion based on knowledge and attitude by using the cross-tabulation method.

3. Results

**Demographics:** The study included 180 responses with 68 male physiotherapists and 112 female physiotherapists. Table 1 indicates the demographic details.
3.1. Area of practice and states of respondents

This survey received physiotherapists’ responses across 16 provinces of India, working in varied specializations and setups (Table 2). Different practicing areas were musculoskeletal, neurological, cardio-pulmonary, community, geriatric, pediatric, women's health, ergonomics, and aquatic physiotherapy. The study obtained responses from Karnataka, Maharashtra, Haryana, Jammu-Kashmir, Uttar Pradesh, Kerala, Telangana, Gujarat, Andhra Pradesh, Assam, Tamil Nadu, Delhi, Bihar, Punjab, Rajasthan, and Sikkim.

3.2. Knowledge of physical activity

Out of total respondents, 89% had learned about the WHO physical activity guidelines as a part of their under-graduation or post-graduation curriculum; however, 11% of physiotherapists never learned about WHO PA guidelines.

This study found that only 18.8% of physiotherapists provided the correct answer across all three domains of WHO PA guidelines. 81.2% selected the incorrect answer in one or more questions. 61.6% responded correctly in a query on moderate PA guideline, whereas questions on vigorous PA and strengthening received 48.3% and 35.5% correct responses, respectively. Fig. 1 represents the knowledge of physiotherapists about WHO PA guidelines.

3.3. Attitude

All physiotherapists responded that PA promotion was undoubtedly essential and were willing to learn more about PA. The study found 126 physiotherapists with an appropriate attitude as they met the 150 min of moderate PA per week. In fifty-four therapists, the physical activity level was less than 150 min per week (Table 3).

3.4. Practice

3.4.1. Physical activity assessment

The study found that 125 physiotherapists assess routine clinical practice’s PA level, whereas 55 do not consider physical activity assessment routinely. Forty percent of respondents reported using a ‘Seven-day physical activity recall questionnaire’ for PA assessment. Fig. 2 summarizes the details.

3.4.2. Physical activity promotion

The results showed that 170 physiotherapists start an active conversation on physical activity with clients, and only 122 responded that they promote physical activities as a routine practice (Table 3).

The most preferred way of physical activity promotion was ‘brief counseling to explain its benefits’ followed by ‘problem-based exercise teaching’ with the least preference for ‘audio-visual counseling’ mode (Fig. 3).

Fifty-eight physiotherapists responded that they do not promote physical activities as a routine practice for different reasons. However, the most commonly reported barriers for promoting physical activities were ‘lack of time’ and ‘lack of motivation.’ (Fig. 4).

3.5. PA promotion based on knowledge and attitude

The study showed that out of the total, 68% of physiotherapists promote PA in routine practice. Among physiotherapists who promote PA, 25% (30 out of 122) did not possess the appropriate attitude, and 75% (92 out of 122) had an appropriate attitude (Table 4).

Interestingly only 24% (29 out of 122) physiotherapists promote PA even though they did not possess adequate knowledge nor possessed the necessary attitude. Interestingly, this study also found that 69% (67 out of 97) of physiotherapists who possessed the right attitude but lacked adequate knowledge still vigorously promote PA (Table 6).

4. Discussion

This cross-sectional survey was intended to explore the knowledge, attitude, and practice of PA promotion among physiotherapists in India during the COVID – 19 pandemic lockdown period. The study tool consisted of 16 close-ended questions. The study analyzed responses from 180 responders received from sixteen states of India. The respondents’ minimum qualification was a Bachelor of Physiotherapy (BPT). Respondents had an average age of 28 years and average work experience of five years. The study found that very few physiotherapists in India have adequate knowledge of WHO PA guidelines. The majority of physiotherapists have an appropriate attitude and willing to learn more about PA promotion. The majority of physiotherapists assess and promote PA in their routine clinical practice using some or other methods. Lack of time and motivation were the common barriers to promoting PA.

4.1. Knowledge of physical activity guidelines

Physical activity plays a vital role in promoting health and preventing chronic diseases (Dean et al., 2014). This survey suggested that most physiotherapists had learned about WHO PA guidelines as a part of their curriculum. It highlights that the Indian physiotherapy curriculum has updated on the knowledge about PA. However, responses suggested inadequate knowledge among the majority of physiotherapists. Our results agree with previous studies conducted in different countries (Freene et al., 2017; Lowe et al., 2017; Oyeyemi et al., 2017; Yona et al., 2019). However, for the efficient practice of PA promotion, physiotherapists should have a thorough knowledge of PA guidelines.
Fig. 1. Knowledge of WHO PA guidelines among respondents.

Table 3
Descriptive statistics of knowledge, attitude, and promotion.

|                | Frequency | Percent |
|----------------|-----------|---------|
| Knowledge      |           |         |
| No             | 146       | 81.1    |
| Yes            | 34        | 18.9    |
| Attitude       |           |         |
| No             | 54        | 30.0    |
| Yes            | 126       | 70.0    |
| Promotion      |           |         |
| No             | 58        | 32.2    |
| Yes            | 122       | 67.8    |
Fig. 3. Modes of PA promotion.

Fig. 4. Barriers of PA promotion.

Table 4
PA promotion based on attitude.

| Attitude | Promotion | Total |
|----------|-----------|-------|
|          | No        | Yes   |      |
| Attitude | 24        | 30    | 54   |
|          | 34        | 92    | 126  |
| Total    | 58        | 122   | 180  |
4.2. The attitude of physiotherapists

This survey suggested that most physiotherapists were active personally and willing to learn more about PA promotion. Our results are contrary to the UK study findings, where most respondents were not physically active as per WHO recommendations (Lowe et al., 2017). Another evidence suggested a self-reported reduction in the physical activity level among Indian physiotherapists during the COVID-19 pandemic (Srivastav et al., 2020).

4.3. The practice of physical activity assessment and promotion

The study found that most physiotherapists routinely perform PA assessment and promotion by using some or other method. Our results contradict Australia’s previous survey, where physiotherapists infrequently promote the PA (Freene et al., 2017). Subjective PA assessment (by using a questionnaire) was the most commonly used tool for PA evaluation. Subjective tools are widely used in practice, possibly due to their cost-efficient and time-saving nature (Hagtstromer et al., 2010). Previous survey findings from Ireland report that most physiotherapists included physical activity level in an initial assessment of a new patient (Donoghue et al., 2015).

A study found that physiotherapists are promoting PA even though they have inadequate knowledge. This result is in line with the previous survey on Nigerian physiotherapists (Oyeyemi et al., 2017). In such a case, the significance of PA promotion is unjustifiable. It also found that physiotherapists who possess the appropriate attitude but lack adequate knowledge still promote physical activities. The results indicated the importance of attitude for the promotion of the physical activity. In previous literature, physically active Turkish physiotherapists have found more confidence in PA promotion (Tuna et al., 2020). At the same time, physical activity promotion without adequate knowledge is not desirable. Hence, increased efforts should be made to disseminate knowledge about physical activities. A survey on physical therapy students in the United States found that they have adequate knowledge of PA guidelines and value their PA promotion role (Pathare et al., 2020).

The implication for bridging the gap of knowledge and practice of PA promotion:

Physiotherapists work in different areas for improving health-related outcomes. It is certain that for a successful treatment and significant results, the approach of intervention should be interdisciplinary (Geidl et al., 2019). Physiotherapists consider PA promotion as secondary or tertiary prevention in impairment related to physical inactivity (Verhagen and Engbers, 2009). However, PA promotion delivered by physiotherapists is useful to increase the PA level (Kunstler et al., 2018). To shift the paradigm of PA promotion practice, the cultural change in the healthcare system is indispensable. The healthcare educational system should be embedded with routine brief clinical advice on PA promotion (Brannan et al., 2019).

The results showed the majority of physiotherapists promoted PA by using some or other method. The results found ‘brief counseling’ to be the most commonly used method for PA promotion. ‘Lack of time’ and ‘lack of motivation’ were the most common causes reported as a hindrance towards promoting PA. Lack of time was the most common barrier found in previous studies (Albert et al., 2020; Aweto et al., 2013). So it has been suggested that the physiotherapists should develop strategies to improve the contact time with the client (Abaraogu et al., 2016). A physiotherapist’s brief PA intervention was considered a practical approach to enhancing the PA level in community-dwelling adults (Freene et al., 2019). Health appropriate behaviors create a positive impact on an individual. Thus, using effective motivational strategies through self-determination, social cognitive theory, cognitive behavioral therapy, and motivational interviewing of individuals by their physiotherapists can prove beneficial (McGrane et al., 2014). Physiotherapists’ involvement across various system-based approaches like promoting a healthy environment, healthy workforces, and creating connections with community assets would now enable PA promotion (Lowe et al., 2018).

### Table 5

| Knowledge | Promotion | Total |
|-----------|-----------|-------|
| No        | 53        | 93    |
| Yes       | 5         | 29    |
| Total     | 58        | 122   |

### Table 6

| Knowledge | Promotion | Total |
|-----------|-----------|-------|
| No        | 23        | 26    |
| Yes       | 30        | 67    |
| Total     | 58        | 122   |
5. Conclusion

This study suggested the majority of physiotherapists perform PA assessment and promotion in routine practice in India. Most of them have an appropriate attitude towards PA, but very few physiotherapists have adequate knowledge of WHO PA guidelines. Lack of time and lack of motivation were the most common barriers to promote PA. This study indicates the importance of attitude for the promotion of PA. At the same time, PA promotion without adequate knowledge is not desirable.

Physiotherapists should actively promote PA in routine practice to reduce the impairment due to physical inactivity, especially during the COVID-19 pandemic in India. Efforts should be made to increase PA awareness in terms of knowledge of WHO PA guidelines, different PA assessment, and promotion strategies among physiotherapists in India.

Funding source

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Declaration of competing interest

All authors declare that there is no conflict of interest.

Acknowledgement

The authors would like to acknowledge the ‘Centre for Diabetic Foot Care and Research’ to support this study. The authors would also like to acknowledge Professor Sudhindra S, Associate Dean Academics, T A Pai Management Institute, Manipal, for his valuable suggestions to improve the manuscript’s methodology and results section.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.jbmt.2020.12.042.

References

Abaraoga, U.O., Edemnub, J.C., Frantz, J., 2016. Promoting physical activity and exercise in daily practice: current practices, barriers, and training needs of physiotherapists in eastern Nigeria. Physiother. Can. 68, 37–45. https://doi.org/10.3138/jpt.0014-74.

Albert, F.A., Crowe, M.J., Malau-Aduli, A.E.O., Malau-Aduli, B.S., 2020. Physical activity: a systematic review of the perceptions of healthcare professionals. Int. J. Environ. Res. Publ. Health. https://doi.org/10.3390/ijerph17124358.

Aweto, H.A., Oligbo, C.N., Fapojuous, O.F., Olaye, O.A., 2013. Knowledge, attitude and practice of physiotherapists towards promotion of physically active lifestyle in patient management. BMC Health Serv. Res. 13 https://doi.org/10.1186/1472-6963-13-1.

Barrett, E.M., Darod, C.D., Hussey, J., 2013. Promotion of physical activity in primary care: knowledge and practice of general practitioners and physiotherapists. J. Publ. Health. 21, 63–69. https://doi.org/10.3334/jph10395-012-0512-01.

Bannan, M., Bernardotto, M., Clarke, N., Varney, J., 2019. Moving healthcare professionals - a whole system approach to embed physical activity in clinical practice. BMC Med. Educ. 19, 1–7. https://doi.org/10.1186/s12909-019-1517-y.

Bull, F., Saad Al-Ansari, S., Biddle, S., Borodulin, K., Buman, M., Cardon, G., Carrey, C., Chaput, J-P., Chastin, S., Crouli, C., Dempsey, P., DiPietro, L., Ekelund, U., Firth, J., Friedenreich, C., Garcia, L., Gichu, M., Jago, R., Katzmarzyk, P., Lambert, E., Leitmann, M., Milton, C., Ortega, F., Raina, C., Ruokolainen, E., Willumsen, J., 2020. World health organization 2020 guidelines on physical activity and sedentary behaviour. Br. J. Sports Med. 1451–1462. https://doi.org/10.1136/bjsports-2020-062955.

Dean, E., Dornelas De Andrade, A., O’Donoghue, G., Skinner, M., Unereh, G., Beenen, P., Cleaver, S., Afzalzada, D., Fran Delaune, M., Footer, C., Gannotti, M., Gappmaier, E., Figl-Herlein, A., Henderson, B., Hudson, M.K., Siviter, K., King, J., Klug, M.L., Lakso, E.L., Lapier, T., Lomi, C., Matari, S., Mateereke, M., Meyer, E.R., McMenamin, V.R., Mostert-Weurzel, K., Myriam, H., Facing the Obstacles: M., Peterson, C., Petrusdottir, U., Robinson, J., Sangroula, K., Stendstorff, A.K., Yee Tan, B., Tschoepe, B.A., Bruno, S., Mathur, S., Wong, W.P., 2014. The second physical therapy summit on global health: developing an action plan to promote participation in daily physical activity and reduce the burden of non-communicable diseases. Physiother. Theory Pract. 30, 261–275. https://doi.org/10.3109/09593985.2013.856977.

Freene, N., Cools, B., Bissett, B., 2017. Are we missing opportunities? Physiotherapy and physical activity promotion: a cross-sectional survey. BMC Sports Sci. Med. Rehabil. 11, 1–9. https://doi.org/10.1186/s13102-017-0143-7.

Gedl, W., Wais, J., Fangmann, C., Demisse, E., Pfeifer, K., Sudeck, G., 2019. Physical activity promotion in daily exercise therapy: the perspectives of exercise therapists in German rehabilitation settings. BMC Sports Sci. Med. Rehabil. 11, 1–13. https://doi.org/10.1186/s13102-019-0143-7.

Hagstromer, M., Ainsworth, B.E., Oja, P., Sjostrom, M., 2010. Comparison of a subjective and an objective measure of physical activity in a population sample. J. Phys. Act. Health 7, 541–550. https://doi.org/10.1123/jpah.7.6.541.

Kunstler, B.E., Cook, J.L., Freene, N., Finch, C.E., Kemp, J.L., O’Halloran, P.D., Gaida, J.E., 2018. Physiotherapist-led physical activity interventions are efficacious at increasing physical activity levels: a systematic review and meta-analysis. Clin. J. Sport Med. 28, 304–315. https://doi.org/10.1097/MSS.0000000000001447.

Lowe, A., Crowe, M., McLean, S., Good, C., Lindsay, C., Everet, S., 2018. Physical activity promotion in physiotherapy practice: a systematic scoping review of a decade of literature. Br. J. Sports Med. 52, 122–127. https://doi.org/10.1136/bjsports-2016-096735.

McGrane, N., Cusack, T., O’Donoghue, G., Stokes, E., 2014. Motivational strategies for physiotherapists. Phys. Ther. Rev. 19, 136–142. https://doi.org/10.1177/1743288x13501093.

Nethan, S., Sinha, D., Mehrotra, R., 2017. Non communicable disease risk factors and their trends in India. Asian Pac. J. Cancer Prev. APJCP. https://doi.org/10.22034/ APJCP.201718.7.005.

Nilima, N., Kausik, S., Triwary, B., Pandey, P.K., 2020. Psycho-social factors associated with the nationwide lockdown in India during COVID-19 pandemic. Clin. Epidemiol. Glob. Heal. 1–6. https://doi.org/10.2147/CEJG.S206010.

Oyeyemi, A.L., Oyeyemi, A.Y., Habib, R.Y., Usman, R.B., Sunday, J.U., 2017. A survey of knowledge of physical activity guidelines and the physical activity habits of UK physiotherapists. BMJ Open Sport. Exerc. Med. 3, 1–7. https://doi.org/10.1136/bmjsports-2016-000290.

Peterson, C., Peterson, K., Gair, B., Barr, T., Moe, S., Biondo, S., 2016. Physiotherapy and physical activity promotion: a cross-sectional survey exploring physical activity promotion, knowledge of physical activity guidelines and the physical activity habits of UK physiotherapists. BMJ Open Sport. Exerc. Med. 3, 1–7. https://doi.org/10.1136/bmjsports-2016-000290.

Puthara, N., Conroy, J., Riggall, A., Hansen, M., 2020. Physical activity: levels, knowledge, and attitudes of physical therapy students in the United States. Cardiopulm. Phys. Ther. J. 31, 57–65. https://doi.org/10.1097/CPT.00000000000000115.

Shajith Aanop, A.M.A.G.A.B.R.G.K., 2020. Effects of nationwide lockdown in India during COVID-19 pandemic. Clin. Epidemiol. Glob. Heal. 1–6. https://doi.org/10.2147/CEJG.S206010.

Srivastav, A.K., Sharma, N., Samuel, A.J., 2020. Impact of Coronavirus disease-19 (COVID-19) lockdown on physical activity and energy expenditure among physiotherapy professionals and students using web-based open E-surveys sent through WhatsApp, Facebook and Instagram messengers: impact of COVID-19 lock. Clin. Epidemiol. Glob. Heal. 19 https://doi.org/10.1136/cejg.2020.070033.

Tunda, B., Bozan, O., Elibol, N., Unver, B., 2020. Are the physical activity habits of Turkish physiotherapists associated with their physical activity promotion and counseling? Physiother. Theory Pract. https://doi.org/10.1080/09593985.2020.1729909.

Veluswamy, S.K., Maiya, A.G., Nair, S., Siddiqua, V., Nair, N.S., Vidyasagar, S., 2014. Awareness of chronic disease related health benefits of physical activity among residents of a rural South Indian region: a cross-sectional study. Int. J. Behav. Nutr. Phys. Act. 11, 27. https://doi.org/10.1186/s12965-011-0027-2.

Verhagen, E., Engbers, L., 2009. The physical therapist’s role in physical activity

469
promotion. Br. J. Sports Med. 43, 99–101. https://doi.org/10.1136/bjsm.2008.053801.

von Elm, E., Altman, D.G., Egger, M., Pocock, S.J., Gotzsche, P.C., Vandenbroucke, J.P., 2008. The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement: guidelines for reporting observational studies. J. Clin. Epidemiol. https://doi.org/10.1016/j.jclinepi.2007.11.008.

Weiler, R., Chew, S., Coombs, N., Hamer, M., Stamatakis, E., 2012. Physical activity education in the undergraduate curricula of all UK medical schools: are tomorrow’s doctors equipped to follow clinical guidelines? Br. J. Sports Med. 46, 1024–1026. https://doi.org/10.1136/bjsports-2012-091380.

World Health Organization, 2010. Global recommendations on physical activity for health WHO. https://doi.org/10.1017/CBO9781107415324.004.

Yona, T., Ben Ami, N., Azmon, M., Weisman, A., Keshet, N., 2019. Physiotherapists lack knowledge of the WHO physical activity guidelines. A local or a global problem? Musculoskelet. Sci. Pract. 43, 70–75. https://doi.org/10.1016/j.jsksp.2019.07.007.