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June Kume

Touro College, [june.kume@touro.edu](mailto:june.kume@touro.edu)

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# Meditation and Mindfulness in the Peer-Reviewed Literature: Review



**June Kume\***

Department of Physical Therapy, USA

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**\*Corresponding author:** June Kume, Touro College, Department of Physical Therapy, 1700 Union Blvd, Bay Shore, NY 11706, USA, Email: [June.Kume@Touro.edu](mailto:June.Kume@Touro.edu)

## Abstract

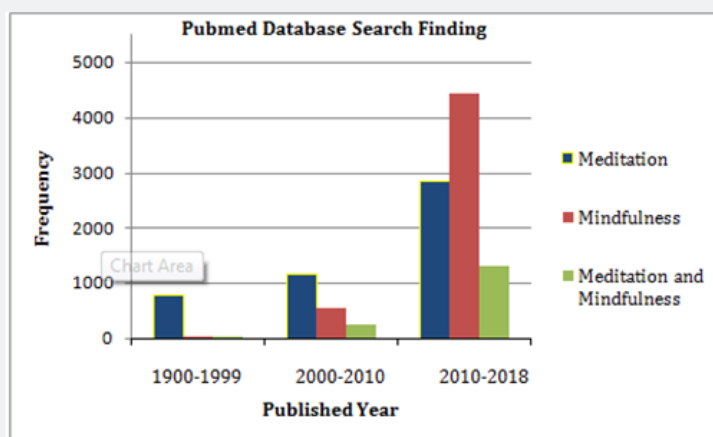
Meditation and mindfulness are practices that have become readily accepted within the mainstream Westernized culture, as evidenced by the plethora of widely available ways to implement them via online, written, and in-person resources. Expanding evidence demonstrating the beneficial physical and psychological consequences of adhering to these approaches are becoming better understood. As a result, the acceptance to use these approaches in practical applications appears to have become slowly more integrated within medical and scientific investigations over the past twenty years. The current discussion reviews the trending changes in publications of peer-reviewed medical and scientific literature encompassing these topics while providing insight as to the possible reasons why these changes have occurred. Based upon these empirical observations, it is anticipated that there will be further future upswings in usage for these approaches within clinical rehabilitation settings, including within the area of physical therapy.

**Keywords:** Applications; Trends; Healthcare; Clinical rehabilitation

## Introduction

Meditation and mindfulness are centuries old practices with deep roots originating from Eastern religions of Hinduism and Buddhism. The underlying principles for each concept are intrinsically simple in nature. Meditation is an “actionable” term denoting a large group of methodologies meant to focus one’s attention, usually by emphasizing the visceral sensation of breathing. Chodron P [1] refers to this as “an invitation to notice when we reach our limit and to not get carried away by

hope and fear”[1]. Mindfulness refers to the cognitive process of “paying attention in a particular way: on purpose, in the present moment, and non-judgmentally”[2]. Once perceived as a non-scientific and spiritual approach espoused by only a small subsection of Westernized society, these concepts have broadened considerably over the last twenty years to be embraced by larger communities, and more specifically, the scientific and healthcare professions.



**Figure 1:** Increasing frequency of articles generated from PubMed database searches from 1900 to 1999; 2000-2010, and 2010-2018 using the search terms noted in graph.

Focused searches of PubMed, a database specifically utilized for biomedical and life sciences journals maintained by the US National Library of Medicine and National Institutes of Health (NLM/NIH), supports the view that these two practices within the scientific and medical community are increasingly under scrutiny (PubMed, accessed on 02/26/2018, <https://www.ncbi.nlm.nih.gov/pubmed/>). Inputting the search term, “meditation” with a filter spanning the years from 1900 to 1999, generated 775 publications results. Similarly, the search term, “mindfulness” yielded 39 articles, and the combination of the two terms (“meditation AND mindfulness”) yielded only 23 articles. In contrast, articles searched in the early 21st century (2000 to 2010) had an overall increase in publications for all three terms, with “meditation” yielding 1148 articles, “mindfulness” presenting 555 articles, and the combination resulting in 244 hits. When considering the last eight years of publications, the upward trend is even more pronounced. For this time period (2010 to 2018), the term “meditation” yielded 2842 results (representing a 248% increase from the prior decade), “mindfulness” yielded 4435 (representing an astonishing 799% increase), and in the combined phrase of “meditation AND mindfulness” produced a total yield of 1312 article hits (a 538% increase). The trajectory (Figure 1) of peer-reviewed publications over time suggests a widening acceptance of these traditionally Eastern approaches within more largely Westernized scientific circles.

In order to view how these interventions were being studied with relation to clinical rehabilitation objectives, a search was done looking specifically at their relation to physical therapy, a discipline that some have reported to be conducive for these practices[3]. For this more focused search, it was found that the number of physical therapy publications related to mindfulness and meditation has also been increasing, albeit on a much smaller scale. Within the last time period (2010 to 2018) for example, 12 articles have been published with respect to “mindfulness AND physical therapy”; of those only two were clinical trials and the remainder were reviews. For studies which referenced “meditation AND physical therapy”, the number of articles generated were 15 (7 clinical trials and 8 reviews). Prior to that period, only 4 studies (1 clinical, 3 reviews) were noted for “meditation” and “physical therapy”; none were noted for “mindfulness” and physical therapy.

Overall, these peer reviewed studies have supported application of meditation and mindfulness in multiple non-clinical and clinical settings. Subject participants have encompassed extremely diverse populations, including graduate and medical students [4,5], adults with ADHD [6], older individuals [7], military veterans with post-traumatic stress [8], and individuals with dementia [9]. Physiological as well as brain neuroplastic changes have been associated in response to participation in mindfulness-based stress reduction programs [10,11], and meditation practice [12-14]; findings which provide clinically rele-

vant consequences within the rehabilitative setting.

### Discussion

The upwardly mobile focus surrounding these practices may be partly attributed to the work of Kabat Zinn J [2]. Kabat Zinn J [2] was among the first to introduce the concepts of mindfulness and meditation to the Westernized culture. In his book, initially published in 1998, “Wherever You Go, There You Are”, he noted that mindfulness “has nothing to do with Buddhism per se or with becoming a Buddhist, but it has everything to do with waking up and living in harmony with oneself and the world.” By providing a theoretical framework for meditation and mindfulness within a non-spiritual context, Kabat Zinn [2] initially opened the door for others with the intention to help them adopt an extremely effective method for self-soothing and anxiety management [2]. The timeline for the increase in peer-reviewed publications falls within the introduction of Kabat Zinn [2] mindfulness training, as well as for alternate programs such as the Koru mindfulness program established by Rogers H & Maytan M [5]. The latter has been suggested to be effective in improving stress, ameliorating sleep disturbances and increasing self-compassion and mindfulness in students [13].

### Conclusion

Despite the overall increase in peer-reviewed publications within the medical and scientific literature, there still remain a relatively scant number emphasizing the therapeutic use of mindfulness-based or meditative interventions within clinical rehabilitation settings. In physical therapy practice, the number of peer-reviewed studies are exceedingly low suggesting minimal investigation within this discipline despite the conducive nature of this setting to use such approaches. Many practicing physical therapists, for example, use breathing methods as part of their “normal” rehabilitative efforts to treat those patients with respiratory deficits (i.e. through the use of diaphragmatic and pursed lip breathing), it is thus not unreasonable to expand this method to include approaches of mindfulness and meditation to these and other patient populations.

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