

# A Review of Research on Buddhism and Health: 1980–2003

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**ABSTRACT.** Electronic searches of social science and biomedical literature identified 44 empirical studies that specifically investigate Buddhism, meditation, and health. The number of studies increased over time, especially in medical and other health-related fields. The studies were found to differ by geographical region with regard to the emphasis on spiritual, psychological, or physical outcomes. Results from this study are explored with respect to historical trends as well as current variations in scholarship and religious practice between the regions.

**KEYWORDS.** Alternative medicine, Buddhism, health, meditation, Zen

## *INTRODUCTION*

For the past two decades, there has been a dramatic increase in the knowledge and practice of Buddhism in Western countries. Estimates

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on the number of world adherents to Buddhism differ widely, with numbers ranging from 250 million (Zickgraf, 1999) to 360 million (Marty & Appleby, 1992). While it is beyond the scope of this article to explore differences based on world population, regardless of the specific figures, it is clear that the number of world adherents is shifting, with political pressures in places like Tibet and Malaysia effecting a decrease in adherents born into Buddhism and media exposure to figures like the Dalai Lama and Thich Nat Han causing an increase in the number of Buddhist converts in Western countries.

Sustained interactions between Eastern and Western Buddhist traditions have recently produced rich interchanges between philosophies and culture. Moreover, the depth and diversity of the new international sangha (Buddhist community) has produced a fascinating body of research. In order to deepen the understanding of developments currently taking place in the field of religion and health, the authors decided to review research that has been conducted over the past two decades throughout the world. This article explores both the differences in scholarship between geographical areas as well as the trends in the scientific study of the impact of Buddhism on physical, mental, and spiritual health.

## ***METHODS***

Searches were conducted in the American Psychological Association's (APA) database, PsycINFO, and the National Library of Medicine's (NLM) database, PubMed, to identify English-language articles pertaining to Buddhism and health between 1980 and 2003. Three electronic searches were conducted in PsycINFO. The first search identified all articles that contained the terms Buddhist, Buddhism, Buddha, or Zen under their subject heading—which searches for the phrase in the Title, Keywords, and Key Concepts fields. The search term is referred to hereafter simply as Buddhism. The second search looked for Buddhism in conjunction with “meditation,” “complementary medicine,” “alternative medicine,” or “health.” The third search used the same combination of terms but was limited to “empirical studies.”

Two similar searches were conducted in PubMed using Buddhism as the major subject heading or title. Because PubMed does not have a function to delimit searches for empirical studies, the authors

examined the titles, abstracts, and article descriptors to discern whether an article was an empirical study. If a determination could not be made based upon this information, the article was obtained and read to see if it was a research study.

All empirical studies on Buddhism that dealt with meditation, complementary medicine, alternative medicine, and health were obtained and read. Studies were classified and coded by year, journal, topic, research methodology (case study, survey, experiment, etc.), and types of measures used.

The authors' familiarity with the literature indicated that some research articles were not identified by the electronic searches. Therefore, the electronic searches were supplemented by examining the citations in *Handbook of Religion and Health* (Koenig et al., 2001) to ensure that the coverage of the literature was complete. A comprehensive compendium of all the research on religion and health conducted between the years 1980 and 2000 was obtained.

## RESULTS

The electronic searches of PsycINFO and PubMed yielded a total of 39 empirical articles that met criteria for inclusion in the study. Four additional articles addressing the interaction of Buddhism and health were located in the *Handbook of Religion and Health* (2001), yielding a total of 43 empirical studies identified from the three different sources.

A significant linear increase was observed in the frequency of articles published over time,  $r(41) = .47$ , ( $p < 0.05$ ). The types of journals in which the articles appeared changed significantly over time,  $\chi^2(2) = 9.3$ , ( $p < 0.01$ ). The vast majority of articles that were published during the first half of the study period appeared in social science journals, as shown in Table 1. During the second half of the study, the percentages of articles published in the three types of journals were roughly comparable due to an increase in articles on Buddhism published in other types of journals.

Table 2 shows the specific outcome variables measured in the 43 studies in our sample. Less than 10% of the studies considered spiritual or religious variables, such as a sense of spiritual transcendence or enlightenment. About half of the studies measured psychological variables, including levels of coping, anxiety, and self-actualization.

TABLE 1. Percent of Articles Published in Different Types of Journals over Time

Type of Journal	1980–1991		1992–2003	
	<i>n</i>	%	<i>n</i>	%
Social science	12	85.7	11	37.9
Medicine	2	14.3	10	34.5
Other health-related	0	0.0	8	27.6
Total	14	100.0	29	100.0

Just under 40% of the studies examined physical outcomes, such as renal functioning, cardiac variability, and autonomic nervous system functioning.

Table 3 presents the distribution of the three major classes of dependent variables by journal type. As would be expected, social science journals primarily examined psychological outcomes (65.2%), and media journals chiefly evaluated physical outcomes (58.3%).

Sixty-three percent (27 of 43) of the studies focused on the connections between meditation and health indices. Of these 27 studies, 7.6% addressed spiritual or religious outcomes such as the achievement

TABLE 2. Distribution of the Types of Dependent Variables Studied

Category	Dependent Variable	<i>n</i>	%
Spiritual or religious	Spiritual transformation	3	7.0
	Religious experience	1	2.3
	Subtotal	4	9.3
Psychological	Feelings and attitudes	4	9.3
	Perceptions	4	9.3
	Psychopathology	5	11.6
	Self-awareness	9	20.9
	Subtotal	22	51.2
Physical	Diagnosis and symptoms	3	7.0
	Immunological responses	2	4.7
	Nervous system	5	11.6
	Nutrition	2	4.7
	Vital signs	2	4.7
	Other	3	7.0
	Subtotal	17	39.5
Total		43	100.0

TABLE 3. Percent of Three Major Classes of Dependent Variables Measured in Studies Published in Three Types of Journals

Type of Journal	Spiritual		Psychological		Physical		Total	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Social science	2	8.7	16	69.6	5	21.7	23	100.0
Medicine	1	8.3	4	33.3	7	58.3	12	100.0
Other health-related	1	12.5	3	37.5	4	50.0	8	100.0

of enlightenment, 53.8% evaluated psychological outcomes including defensive style and drug addiction, and 38.5% examined physical outcomes such as T-cell levels and MRI brain scans. Table 4 gives an overview of these findings.

The articles include samples from many different countries, which we divided into four geographical regions. Table 5 shows the types of outcomes measured by region. Studies evaluating samples in Asia, which comprised 44.2% of the studies in our sample, were the least likely to explore connections between Buddhism and religious or spiritual experiences. Researchers evaluating samples in Asia were more likely than those evaluating samples from the other three regions to focus on the connection between Buddhism and physical health,

TABLE 4. Distribution of the Types and Numbers of Dependent Variables Examined in the Meditation Studies

Category	<i>n</i>	%	
Spiritual or religious	Spiritual transformation	1	3.8
	Religious experience	1	3.8
	Subtotal	2	7.6
Psychological	Perceptions	4	15.4
	Psychopathology	1	3.8
	Self-awareness	9	34.6
	Subtotal	14	53.8
Physical	Immunological responses	2	7.7
	Nervous system	5	19.2
	Nutrition	1	3.8
	Vital signs	2	7.7
	Subtotal	10	38.5
Total	26	100.0	

TABLE 5. Distribution of the Types and Numbers of Dependent Variables Examined by Geographical Sample

Outcome Measures	Asia (%)	Australia (%)	Europe (%)	United States (%)
Spiritual or religious	0.0	16.7	20.0	15.4
Psychological	42.1	50.0	60.0	61.5
Physical	52.6	33.3	20.0	23.1
Other	5.3	0.0	0.0	0.0
Total	100.0	100.0	100.0	100.0

$\chi^2(1) = 4.0$ , ( $p < 0.05$ ). Research examining samples in the remaining regions, Australia, Europe, and the United States, comprised 56.2% of the studies in our sample. No significant differences were found regarding the research foci of these studies, and experimental outcomes from these studies were equally distributed among the three categories of variables—psychological, physical and spiritual/religious.

An exploration of the types of samples employed in the different geographical regions revealed significant differences between the regions regarding religious orientation of the samples  $\chi^2(2) = 13.85$ , ( $p < 0.01$ ). The majority (89.5%) of the research in Asia studied Buddhist populations, while only 33.3% of the research in the three other regions focused on Buddhists. The majority (58.3%) of the studies on samples in the United States, Europe, and Australia did not specify the religious affiliation of participants, while only a minority (10.5%) of studies in Asia did not specify religious orientation.

Further analyses were conducted to evaluate the types of Buddhist samples employed in Eastern and Western studies. Of the Eastern studies, 50% examined lay Buddhist practitioners and the other 50% examined Buddhist monks or priests. Of the Western studies, including Australia, 66.7% of the studies of Buddhists employed lay samples and 33.3% employed Buddhist monks or priests.

Although studies on Eastern and Western samples examined meditation with equal frequency, significant differences were found regarding the outcome measures employed in these meditation studies  $\chi^2(2) = 7.17$ , ( $p < 0.05$ ). The majority (68.8%) of the Western studies focusing on meditation measured psychological outcomes such as self-awareness and perception. By contrast, the majority (70.0%) of the Eastern studies focusing on meditation measured physical outcomes involving the nervous system and physiological vital signs. Only 12.5% of the Western meditation studies examined

spiritual or religious outcomes, while none of the Eastern meditation studies examined spiritual or religious outcomes.

No significant differences were found regarding the types of meditation that were studied in these two regions. Of the studies using Western subjects, 35.3% of the studies examined a form of Vipassana or Insight meditation, 52.9% evaluated a form of Zen meditation, and the remaining 11.8% evaluated various forms of meditation in the same study. In the East, 30.0% of the meditation studies evaluated Vipassana or Insight meditation, 40.0% investigated a form of Zen meditation, 20.0% did not specify the type of meditation, and the remaining 10.0% evaluated another form of meditation such as g Tum-mo meditation. Of all the studies in both regions evaluating a form of Zen meditation, 78.6% do not specifically indicate what type of meditation is being examined, such as breath, shikantaza, or koan nenti. Of the studies evaluating Vipassana meditation, 55.6% do not delineate a specific type of meditation, while 44.4% do specify a particular type of meditation, such as Dharmakaya.

## *DISCUSSION*

The authors found a total of 43 empirical studies focusing on the connections between Buddhism and health. From 1980 to 2003, the number of studies published in this area increased significantly, with the number of studies doubling from the first half (1980–1991) to the second half (1992–2003) of this time period. During the first half of our study, we observed that most of the articles were published in social science journals. During the second half of our study the articles reflect a wider array of disciplines, with significant increases in medical, nursing, epidemiological, and other health-related journals. This finding was expected, given the rise in the number of studies in biomedical literature focusing on religion and health over the last four decades, and the general trend in health care recognizing the role of spirituality and religion in the development and maintenance of illness (Weaver et al., 2003).

### *Regional Analysis of the Literature*

The research examined in the present study represents the scholarship of a wide variety of countries. Although Buddhism emerged

from the East over 2500 years ago, it is interesting to note that just over 56% of the articles investigated samples from the United States, Europe, and Australia, while the remaining 44% examined samples from countries in Asia. The research conducted in these geographical regions differs in subtle ways. An exploration of the contextual variations between these regions may prove to be useful in shedding light on the distinctions in scholarship.

Loori (1992) delineates three ways in which Buddhism has undergone a revolution in coming from the East to the West. First, the freedom of Western culture guarantees that Buddhist vows, expressed as social action, can be practiced without fear of sociopolitical retribution. Second, the presence of women as both teachers and lay practitioners in significant numbers is a phenomenon heretofore absent in practicing Buddhist communities. Third, the lay community has taken on a new role in both Buddhist monasteries and practice centers. While lay practitioners date back to the time of the Buddha, they were frequently "alms givers" to the more dominant monks immersed in monastic practice. In the West, a new interest and enthusiasm for monastic practice on the part of lay practitioners has flowered over the last 40 years. Lay practitioners have insisted on learning the rituals, liturgy, sutra study, and meditation practices that were formerly the guarded domain of monks.

A fourth revolution to this list of phenomenological changes is the impact of Buddhism on both the Western psychotherapeutic canon and modern medical research. With regard to the first point, it would seem that, although psychology and religion have warily circled each other since the time of Freud, their suspicions are slowly dissolving in the swirling, integrating dance of Eastern and Western thought.<sup>1</sup> Within this larger dance of integrating psychology and religion, a growing number of theorists and researchers began focusing on the interconnections between Buddhism and Western psychology (e.g., Fromm et al., 1960) and more recently, on the empirical interconnections between Buddhist practices and psychological outcomes such as self-actualization (Compton & Becker, 1983), ego defense mechanisms (Emavardhana & Tori, 1997), and anxiety reduction (Kabat-Zinn et al., 1982; Miller et al., 1995).

A similar movement has also taken place in the medical community of the United States, Europe, and Australia. Physicians, nurses, social workers, and other health care practitioners are increasingly addressing the relationship between religion/spirituality and

medicine, as well as recognizing the importance of religion in the lives of westerners, especially in times of illness (e.g., Post et al., 2000).

Although in the East, the marriage of medicine and religion has a long history, Hall (2003) notes that many Western neuroscientists have intentionally separated meditation from religion in order to preserve both the substance and rigor of their approach. This is certainly the case in the studies that we examined. Of the 18 studies in which Western researchers examined the effects of meditation on either physical or mental health, 11 of them did not employ a religious frame, either to understand the meditation practices or the results.

However, the neuroscientific study of Buddhist meditation recently has crossed a threshold of acceptability as a topic worthy of scientific attention. Improvements in brain-scanning technologies have allowed for a more substantive understanding of the mind in the meditative state as well as new insights into the impact of prolonged meditation on the brain. For example, Benson et al. (1990) observed marked asymmetry in alpha and beta activity between the brain hemispheres in Tibetan Buddhist monks practicing *g Tum-mo*.

Moreover, biophysical advances have allowed for a more subtle understanding of the mind's impact on immunologic functioning. Higuchi et al. (1998) conducted experiments on Soto Zen priests at Soujiji Temple in Japan. After a 40-minute session of *zazen*, blood samples of the priests showed increased CD4 levels, indicating improved immune capability.

It would seem that the scientific investigation of Buddhism is a natural compliment to the practice itself, since Buddhism, like science, is a pragmatic investigation into the nature of the self, as opposed to a doctrinal adherence to dogma. In fact, the Buddha cautioned his students not to blindly accept his words, but to test his teachings in the crucible of their own experience.

### ***Current Scholarship***

Consistent with the increasingly interdisciplinary approach to the study of religion in the West, researchers from the United States, Australia, and Europe were just as likely to investigate the inter-play between Buddhism and psychological and physical outcomes as they were to examine the connection between Buddhism and spiritual outcomes. By contrast, in keeping with the historical relationship

between medicine and religion in the East, researchers in Asia were more likely than researchers from other regions to examine physiological correlates of Buddhism, such as renal functioning and immunological response. Researchers in Asia were also less likely than researchers from the West to examine the spiritual or religious experiences associated with Buddhism, even though researchers from Asia were more likely than those from the West to look at purely Buddhist participants as opposed to mixed Buddhist and non-Buddhist individuals attending Buddhist retreats.

The rise of Buddhism in the West is attributable not only to the flow of Buddhist immigrants but to the rising number of sincerely practicing Buddhist converts. Our study shows that the samples of Western study participants consist of Buddhist and non-Buddhist practitioners to a far greater degree than in Asian studies.

We also noted above that lay communities in the West are more involved in serious Buddhist practices. In the studies we examined, we noticed that two thirds of Western studies as opposed to half of the Eastern studies focused on lay participants over Buddhist monks and priests.

Both Eastern and Western studies focused equally, not only on the practice of meditation itself, but on the forms of Zen vs. Vipassana meditation. Of the Western meditation studies, only 23.5% specified the particular form of practice, such as breath practice, shikantaza, or koan study, as opposed to half of the Eastern studies, which specified a particular practice form such as Dharmakaya.

Hall (2003) quotes Richard Davidson, a neuroscientist studying Buddhist meditation, who points out that using the word “meditation” as a catch-all phrase to describe various Buddhist practices is as limiting to our understanding as using the word “sports” to describe soccer, basketball, and tennis. While meditation is central to the practice of particular types of Buddhism, no one form predominates. One standard classification has been to divide the many forms of Buddhist meditation into two types. The first is concentration, where a practitioner focuses on a mental object like a mantra, a koan, or flows of body energy to develop mental strength—that is, an ability to direct the mind where, when, and for how long one chooses. Devoted and sustained practice can lead the practitioner to a state of absorption and tranquility known as Samadhi, a state in which the mind is absorbed in intense concentration, free from thoughts, distractions, and goals.

The second type of meditation is known as mindfulness, a detached observance of one's mental functioning and environment. Sincere dedication to this form may lead a practitioner to experience one-pointedness or nirvana, a place of clear awareness and true insight where the ultimate nature of reality is realized. Within these two types, there are also three broad schools of meditation. The Zen meditation school includes concentration practices (such as counting or following the breath), koan study (a paradoxical riddle or question that helps cut through the mental conditioning in order to distinguish reality from delusion), and mindfulness practices such as Shikantaza (a technique of "just sitting" in order to develop clear insight and pure awareness). The Vipassana meditation school includes practices for cultivating compassion and awareness. Specific practices may include focusing on the awareness of body sensations, such as one's foot touching the floor, or on awareness of the breath entering the nostrils. The Tibetan Meditation School includes a mixture of devotional, concentration, and insight practices, and includes tantric traditions—methods for achieving body-mind integration—from 6th century India. So, given numerous types of Buddhist meditation, it would seem a useful endeavor to embrace the subtleties of these practices within the scope and focus of future research.

### ***Buddhism and Health***

The World Health Organization defines health as "a state of complete physical, mental, and social well-being, and not merely the absence of disease or infirmity" (WHO, 1946). The Buddhist understanding of optimal health is similar, with an emphasis on a balanced interaction between mind and body. Illness is thought to emerge when this balance is disrupted, and Buddhist practices are thought to restore and strengthen the integration of mind and body. The difficulties inherent in measuring this subtle interaction, however, abound, but several of the articles reviewed attempt to evaluate this delicate relationship between mind, body, and spirit. For example, Emavardhana and Tori (1997) investigated the transitory aspects of nonself (anatta) and the freedom found from not clinging to an egocentric identity. The work of Kabat-Zinn et al. (1985) studied participants who were being taught to release from their chronic pain through detached observation in which phenomena were registered with full awareness, yet without distortion.

While modern medicine tends to address the ailing part of the body in isolation, a Buddhist conception of health sees disease as a reflection of the total somatic system and seeks to cure it through a fundamental reorientation of a person's lifestyle and outlook. The optimal condition of health is achieved when mind and body are functioning well and interacting together as one. Central to the Buddhist approach to health and healing is its emphasis on spiritual strength and sense of purpose in life based on compassionate action for others. In this regard, Lo et al. (2003) explored the connections between Zen Buddhist meditation and the arousal of inner energy.

Overall, very few of the studies examined spiritual or religious outcomes. Only 12.5% of the Western meditation and none of the Eastern meditation studies focused on these types of outcomes. The interesting commonality between the research of the East and West, including Australia, is their concentration on Buddhism devoid of a religious or spiritual context. Although Asian studies were the most likely to look at Buddhist samples, these same studies were the least likely to explore spiritual or religious outcomes. In short, our findings indicate that there is little empirical research examining the intersection of religion and health.

## ***CONCLUSIONS***

Results indicate a small but growing body of literature examining the inter-connections between Buddhism and health. Given the recent interest in complementary medicine, mind-body connections, and the growing number of Buddhists in the West, there is a clear need for quality research that will further bring to light the fascinating inter-play between Buddhism, health, and psycho-spiritual indices. We also recommend that studies delineate the religious sub-sects of the samples studied in order to better understand the impact of various Buddhist practices on different groups.

Popper (2002, 2003) described the problem of devising measurable outcomes to explore epiphenomena in a way that meet the criteria of scientific refutability. Likewise, researchers face a similar challenge in the study of Buddhist ontology. For example, given that Zen Buddhism is considered by its most serious adherents to be a direct teaching outside the scriptures and beyond words and ideas, a scientific investigation using modern concepts and methods may present

unusual challenges to future researchers. In the Shobogenzo (Cleary, 2001), a 12th century collection of essays on Buddhist practice, Dogen Zenji, a seminal Zen master writes:

*To study the way is to study the self.*

*To study the self is to forget the self.*

*To forget the self is to be enlightened by all things.*

*To be enlightened by all things is to remove the barriers between one's self and others.*

Given what Dogen is pointing to, and the need to develop a more nuanced understanding of Buddhist practices as they migrate to the West, an appreciation and respect for non-logical phenomena seems called for, while maintaining the rigor and authenticity of research results.

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## NOTE

1. However, some (i.e., Punnaji, n.d.) would note that Buddhism, which was originally intended as a practical solution to the problem of mortality, existence, and the anxiety that underlies all our daily concerns, is entirely a psychological treatment. Others (i.e., Miovic, 2004) point out that Buddhism, which has developed sophisticated systems of understanding the self, does not divorce philosophy or psychology from religion as is typically done in the West.

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