




Health and school performance during home isolation at Institución Educativa Privada Prescott in Puno, Perú

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ABSTRACT

Approximately 2000 indigenous students at Institución Educativa Privada Prescott in Puno, located in the Andes high on the Altiplano of Lake Titicaca, have been instructed in Transcendental Meditation. In this study, we examine the impact of home isolation during the COVID-19 pandemic on physical, cognitive, and emotional health, and school performance for a group of 54 meditating students, and contrast these results to a comparison group of 53 meditating students who reported their health and learning prior to the pandemic. The study is the first to consider the association of home isolation on students practicing meditation in a group: (A) at the same time of day and in the same place as part of their daily school routine and (B) during online sessions at the same time of day but in a different place. Findings indicate both approaches to group meditation before and during the pandemic produced favourable results for health and school performance.

KEYWORDS

Perú; health; school performance; COVID-19; coping; Transcendental Meditation

PALAVRAS-CHAVE

Peru; saúde; desempenho escolar; COVID-19; enfrentamento; Meditação Transcendental

PALABRAS CLAVE

Perú; salud; desempeño escolar; COVID-19; afrontamiento; Meditación Transcendental

Saúde e desempenho escolar durante o isolamento domiciliar na Institución Educativa Privada Prescott em Puno, Peru

RESUMO

Aproximadamente 2.000 estudantes indígenas da Institución Educativa Privada Prescott em Puno, localizada nos Andes no alto do Altiplano do Lago Titicaca, foram instruídos em Meditação Transcendental. Neste estudo, examinamos o impacto do isolamento domiciliar durante a pandemia de COVID-19 na saúde física, cognitiva e emocional e no desempenho escolar de um grupo de 54 alunos meditantes e contrastamos esses resultados com um grupo de 53 alunos meditadores que relataram sua saúde e aprendizado antes da pandemia. O estudo é o primeiro a considerar a associação do isolamento domiciliar em alunos que praticam meditação em grupo: A) no mesmo horário e no mesmo local como parte do cotidiano escolar; e B) durante as sessões online na mesma hora do dia, mas em local diferente. Os resultados indicam que ambas abordagens de meditação em

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grupo antes e durante a pandemia produziram resultados favoráveis para a saúde e o desempenho escolar.

Salud y rendimiento escolar durante el aislamiento domiciliario en Institución Educativa Privada Prescott en Puno, Perú

RESUMEN

Aproximadamente 2.000 estudiantes indígenas de la Institución Educativa Privada Prescott en Puno, ubicada en lo alto de los Andes en el Altiplano del Lago Titicaca, han sido instruidos en Meditación Trascendental. En este estudio examinamos el impacto del aislamiento en el hogar durante la pandemia de COVID-19 en la salud física, cognitiva y emocional y el rendimiento escolar de un grupo de 54 estudiantes que meditan, y contrastamos estos resultados con un grupo de comparación de 53 estudiantes que meditan que informaron su salud y aprendizaje antes de la pandemia. El estudio es el primero en considerar la asociación del aislamiento domiciliario en estudiantes que practican meditación en grupo: A) a la misma hora del día y en el mismo lugar como parte de su rutina escolar diaria; y B) durante sesiones en línea a la misma hora del día pero en un lugar diferente. Los hallazgos indican que ambos enfoques de la meditación grupal antes y durante la pandemia produjeron resultados favorables para la salud y el rendimiento escolar.

1. Introduction

A significant body of literature has emerged concerning the mental health impacts of the COVID-19 pandemic. The literature generally argues that when individuals are deprived of their normal routine of social interaction and freedom of movement, coupled with experiences of financial loss and confusion in political and health messaging, mental and physical health will suffer, potentially leading to increased incidences of anxiety and depression, reduced physical fitness, and other psycho-socio-physical disorders. Such mental states can be caused by fear of the disease or the unknown and may result in maladaptive behaviors (such as insomnia, panic, or anger), defensive responses, and longer-term emotional distress.

For example, Kumar and Nayar (2020, 1; our emphasis) have considered how measures such as self-isolation and quarantine have affected “usual activities, routines, and livelihoods of people that *may lead to an increase in loneliness, anxiety, depression*, insomnia, harmful alcohol and drug use, and self-harm or suicidal behavior.” Pfefferbaum and North (2020, 510; our emphasis) go further by claiming that public health measures associated with lockdowns are “among the major stressors that *undoubtedly will contribute to widespread emotional distress and increased risk for psychiatric illness*.” Bressan et al. (2021) have even found evidence for increased risk of domestic accidents in children during home lockdown.

Cullen, Gulati, and Kelly (2020, 311; our emphasis) reinforce these views when they say “we anticipate a considerable *increase in anxiety and depressive symptoms* among people who do not have preexisting mental health conditions, with some experiencing post-

traumatic stress disorder [PTSD] in due course.” They cite research which found 54% of 1200 people in China rated the adverse psychological impact of COVID-19 as moderate or severe, with 29% experiencing increased anxiety and 17% increased depression. Liang et al. (2020) and Child (2020) maintain that learning and physical health may also be adversely affected. Research emerging from Poland (Parczewska 2020), India (Sankar et al. 2020), China (Duan et al. 2020), and Latin America (Antúnez-Montes et al. 2020) all point to these same general conclusions.

Of interest to the present study, Liu et al. (2020, 347; our emphasis) specifically point out that researchers have realized public health measures like quarantine and home isolation “*might have adverse psychological effects on children who are quarantined,*” but temper their opinion by pointing out for children who are isolated at home with parents or relatives, “the stress caused by such a sharp change in their environment *might be eased to some degree.*” The stressors associated with quarantining and home isolation have been especially highlighted for children with pre-existing conditions, such as those with lung disease (Ademhan Tural et al. 2020), cancer (Saroha and Moulik 2020), and autism (Ameis et al. 2020), and for children in low- and middle-income countries (Zar et al. 2020).

In addition to the potential onset of anxiety and depression and problems associated with learning and physical fitness, the published literature is particularly instructive on adaptive coping mechanisms. For children, adolescents, and adults, multiple psychosocial pathways have been identified to offset the negative effects of quarantine and home isolation, including acceptance/resignation, the use of humor, collaborative online social activities, and acting as if nothing is happening (Liang et al. 2020; Orgilés et al. 2021).

Moreover, indirect mechanisms of coping, associated, for example, with one’s demographic background (such as age and gender) or personality, have also been identified as moderating variables of health outcomes in young people during the pandemic (Volk et al. 2021). Among the various methods of adaptive coping during the pandemic is meditation, however as Black, Milam, and Sussman (2018, e532) have stated, “empirical evidence supports the notion that some forms of meditation such as Transcendental Meditation may be more effective than others ... in reducing ailments and promoting health.”

Allbritton and Heeter (2018, 3) have conceptualized meditation as “attention-based practices that have an immediate effect on the human system and lead to longer term outcomes.” But they also point out different taxonomies of meditation, and indeed research more generally on this subject, have blurred or agglomerated distinctions and definitions of “meditation” (for example, they cite 4 main types of meditation and 12 examples, including the Transcendental Meditation technique) making rigorous research of meditation challenging. Furthermore, “endless variations [of meditation] exist, [and are] interpreted and adapted by individual teachers” (Allbritton and Heeter 2018, 5), a problem for research also noted by Holt (2015).

Taught systematically for over 60 years, the Transcendental Meditation technique is a unique form of meditation, and is one of the most comprehensively researched meditation techniques for the amelioration of psychosocial stressors and the development of resilience (Holt 2015). Transcendental Meditation is said to be

a simple, natural, effortless procedure practiced for fifteen to twenty minutes in the morning and evening while sitting comfortably with the eyes closed. During this technique, the

individual's awareness settles down and experiences a unique state of restful alertness; as the body becomes deeply relaxed, the mind transcends all mental activity to experience the simplest form of human awareness – Transcendental Consciousness – where consciousness is open to itself. This is the self-referral state of consciousness. (Maharishi Foundation International 2014, 3)

As a consequence of the experience of Transcendental Consciousness, the individual's latent creative potential is enlivened while the physiology simultaneously rids itself of accumulated stress and fatigue as a result of the profoundly deep levels of rest gained during the practice. Indeed, earlier research suggested rest during Transcendental Meditation was metabolically more than twice as deep as sleep (for example, it has been associated with apneustic breathing, which is rare in healthy adults, as observed by Kesterson and Clinch 1989) yet during the practice, the mind remains awake and fully alert to its surroundings. This experience is said to enliven “within one's awareness creativity, dynamism, orderliness, and organizing power, which results in increasing effectiveness and success in daily life” (Maharishi Foundation International 2014, 3).

Since the 1970s, the Transcendental Meditation technique has been thoroughly documented, resulting in an extensive corpus of empirical evidence in three broad research categories: (1) *physiology* (including metabolic, biochemical and cardiovascular changes, electrophysiological and electroencephalographic (EEG) changes, physiological efficiency and stability, health, motor and perceptual ability, and athletic performance); (2) *psychology* (including intelligence and creativity, cognitive styles such as field independence, learning, academic performance, and personality); and (3) *sociology* (including rehabilitation, productivity, social and economic impacts, and quality of life) contained in 8 volumes of 678 published studies (Chalmers et al. 1989a, 1989b, 1989c; Dillbeck 2011; Dillbeck et al. 2013, 2020; Gaur et al. 2015; Orme-Johnson and Farrow 1977; Wallace, Orme-Johnson, and Dillbeck 1990).

For example, research in category (1) on EEG and magnetoencephalographic (MEG) changes confirm earlier findings that Transcendental Meditation increases power in the frontal areas of the brain, increases alpha activity, and generally slows brainwave frequencies when compared to a control condition of mental repetition (e.g. Travis 2011; Yamamoto et al. 2006). Examples in category (2) include Colbert and Nidich's (2013) research which found evidence Transcendental Meditation had a salutary effect on high school graduation and college acceptance rates. In category (3), and of relevance to the present study on the COVID-19 pandemic in Perú, Yoshimura et al. (2015) examined residents in two cities affected by the 2011 earthquake and tsunami in Japan and found that even a number of months after the trauma, residents had greater and more intense mental and physical stress symptoms than control subjects but after a week of instruction and practice of Transcendental Meditation, those symptoms and their intensity were significantly alleviated, with the result these residents did not differ from controls.

These findings include psychosocial research relevant to the present study on home isolation during the COVID-19 pandemic. For example, recent randomized controlled research indicates the technique reduces PTSD symptoms, depression, anxiety, sleep difficulties, and anger, and improves quality of life (Bellehsen et al. 2021). Similar salutary effects in children and adolescents have been observed over several decades (e.g. Benn 2003; Bleasdale, Peterson, and Nidich 2019; Grosswald et al. 2008; Nidich et al. 2011; Rosaen and Benn 2006), including reduced stress and anxiety as a means to reducing

symptoms of attention deficit hyperactivity disorder (ADHD), improved skills indicative of increased emotional intelligence (such as self-control, self-reflection/awareness, and flexibility in emotional response), and improved academic performance, and reduced perceived stress, anxiety, anger, depression, and fatigue, and increased self-esteem.

Nidich, Nidich, and Rainforth (1986, 1987) had earlier reported primary-grade students who practiced Transcendental Meditation perform better on standardized tests than their peers in mathematics and quantitative thinking, reading and language skills, and on a range of developmental skills, including improved academic performance, and educational development in correctness of expression, and the social and natural sciences. The authors also report findings associated with increased intelligence scores for primary-grade students who meditate, as well as increased creativity when compared to controls, a finding replicated in later studies by the same authors (Nidich and Nidich 1989; Nidich, Nidich, and Rainforth 1986) and by others (e.g. Dixon et al. 2005).

Nidich and Nidich (1987) also presented results associated with moral reasoning and prosocial behavior of meditating children compared to controls at two alternative schools, finding greater prosocial choice and behavior for self and others by the students who practiced Transcendental Meditation. These findings were associated with length of time practicing the technique and instructors' ratings of classroom prosocial behavior. According to the authors, such findings were also correlated with "brain wave coherence" (457), a topic more thoroughly investigated elsewhere in the context of mood disturbance, anxiety, anger, depression, fatigue, and confusion in adults (e.g. Travis et al. 2018). Research has also been carried out on the collective effects of Transcendental Meditation when practiced in a group, including economic and socio-political effects associated with students (Fergusson 2016; Fergusson and Cavanaugh 2019) and adults (Hagelin et al. 1999).

Similarly, Barnes, Bauza, and Treiber (2003), using among other instruments the Spielberger Anger Expression Scale, found that meditating 15- to 18-year-olds had fewer absenteeisms, fewer school infractions and fewer days of suspension due to behavior-related problems than did a control group. Studies associated with a range of physiologic and psychosocial/behavioral effects of Transcendental Meditation for youths, such as systolic and diastolic blood pressure, anxiety and psychological disorders, have recently been summarized by Black, Milam, and Sussman (2018), and other preliminary regional reports from Latin America about the practice by trainee military and police officers in Brazil have been published (e.g. Belham 2011; Roset and Schuler 2011).

Of most relevance to this study is the finding that Transcendental Meditation, when practiced in a group, generates a greater benefit to participants and their environment as would otherwise be the case if individuals meditated separately. It has previously been established that such group practice has a measurable effect *on the surroundings*, including an influence of harmony and coherence in localized communities and the broader society (e.g. Fergusson 2016; Fergusson and Cavanaugh 2019) measured by reductions in crime and accidents, and improved social health outcomes. Such a phenomenon, and the quantum mechanical field mechanisms behind it, have been explained in detail by Orme-Johnson and Fergusson (2018). This phenomenon is said to be associated with the so-called "field effects of consciousness," which is enlivened in individuals and their surroundings when people practice Transcendental Meditation, but which is amplified when they do so in a group in the same place at the same time. [More interesting in the present context of Perú, participants have also noted anecdotally that their

personal experience is more pronounced when practicing Transcendental Meditation in a group, and reports suggest the practice has a “multiplier” effect on the experience of practitioners themselves, for example on their self-esteem (Fergusson, Ortiz Cabrejos, and Bonshek 2020, 2021a).]

However, this group phenomenon has never been tested when individuals practice Transcendental Meditation separately but at a coordinated time while connected via an online platform, as was the case for students in this study during a home isolation period as a result of their school being closed due to the COVID-19 pandemic. We can thereby identify two main types of “group meditation” practice: condition (1) when individuals meditate in a group at the same time and in the same place (i.e. at school together with their peers) and condition (2) when individuals meditate as a group at the same time but in a different place (i.e. at home while online during isolation or quarantine). The latter interactive meditation phenomenon has yet to be examined anywhere in the world. It is in these two group meditation phenomena, and their relationship to health and school performance in Perú, that this study is interested.

To better understand the possible impact of meditating under condition (2) on the health and school performance of students, we, therefore, asked the following three research questions: RQ1: Do primary and secondary school students in home isolation in Perú report the group practice of Transcendental Meditation is beneficial to their physical health, cognitive health, emotional health, and school performance; if so, RQ2: How do these self-reported experiences compare to matched students who are not in home isolation but meditate together in a group at the same school under condition (1); and RQ3: Do demographics of age, gender, or grade level moderate these home isolation reports?

2. Materials and method

2.1. Setting

As documented elsewhere, Transcendental Meditation has been incorporated into the curricula of many primary and secondary schools in Perú (Fergusson et al. 2021b). Specifically, the present study was conducted at Institución Educativa Privada Prescott (IEPP), a private school located in the city of Puno on Lake Titicaca in the southeast of the country. Puno is home to the Aymara people, a continuous pre-Incan civilization living at 3800 m on the Altiplano in the Andean highlands. With a total population of about 3.0 million people (about 550,000 of whom live in Perú), the Aymara are distributed across eastern Bolivia, southern Perú, and northern Chile, with the largest group concentrated in the Lake Titicaca region where about 110,000 Aymara reside.

IEPP, established in 1992 to offer primary and secondary education, seeks to develop the values of honesty, work, social sensitivity, responsibility towards the community, and respect for family, homeland, and people of the world. Approximately 300 students attend the school, with 2000 students having been instructed in Transcendental Meditation since 1998.

2.2. Participants

Participant data are summarized in Table 1. A total of one hundred and seven ($N = 107$) primary and secondary students (M age = 13.6 years) in two groups volunteered to

Table 1. Demographic data of number and percentage of students with means and standard deviations for age, gender, and grade level for Groups A and B.

Group	Gender		Grade levels						
	Girls	Boys	5th Grade primary	6th Grade primary	1st Grade secondary	2nd Grade secondary	3rd Grade secondary	4th Grade secondary	5th Grade secondary
A	27/50%	26/50%	—	—	10/19%	13/24%	9/17%	11/21%	10/19%
Mean age (SD)	14.4 (1.4)	14.3 (1.4)	—	—	12.4 (0.52)	13.5 (0.52)	14.5 (0.53)	15.4 (0.52)	16.3 (0.67)
B	29/54%	25/46%	10/18%	9/17%	13/24%	8/15%	7/13%	7/13%	—
Mean age (SD)	13.4 (1.8)	12.4 (1.6)	10.2 (0.53)	11.1 (0.53)	12.8 (0.51)	13.6 (0.52)	14.1 (0.53)	15.1 (0.53)	—
Total	56/52%	51/48%	10/9%	9/8%	23/22%	21/20%	16/15%	18/17%	10/9%
Mean age (SD)	13.9 (1.6)	13.3 (1.5)	10.2 (0.53)	11.1 (0.53)	12.6 (0.52)	13.6 (0.52)	14.3 (0.53)	15.3 (0.53)	16.3 (0.67)

participate in this study. Of these, 56 were girls (52%, M age = 13.9 years) and 51 were boys (48%, M age = 13.3), distributed across seven grade levels. Ten participants (9%, M age = 10.2) were in 5th grade primary, 9 participants (8%, M age = 11.1) were in 6th grade primary, 23 participants (22%, M age = 12.6) were in 1st grade secondary, 21 participants (20%, M age = 13.6) were in 2nd grade secondary, 16 participants (15%, M age = 14.3) were in 3rd grade secondary, 18 participants (17%, M age = 15.3) were in 4th grade secondary, and 10 participants (9%, M age = 16.3) were in 5th grade secondary.

In November 2019 prior to the COVID-19 pandemic, participants in Group A, composed of students who meditated together in a group at school as part of the curriculum, consisted of 53 students (M age = 14.4 years), of whom 27 were girls (50%, M age = 14.4 years) and 26 were boys (50%, M age = 14.3). Of this group, 10 participants (19%, M age = 12.4) were in 1st grade secondary, 13 participants (24%, M age = 13.5) were in 2nd grade secondary, 9 participants (17%, M age = 14.5) were in 3rd grade secondary, 11 participants (21%, M age = 15.4) were in 4th grade secondary, and 10 participants (19%, M age = 16.3) were in 5th grade secondary.

In December 2020 during COVID-19 pandemic, participants in Group B, composed of students who meditated together online at the same time while in home isolation, consisted of 54 students (M age = 12.9 years), of whom 29 were girls (54%, M age = 13.4 years) and 25 were boys (46%, M age = 12.4). Of this group, 10 participants (18%, M age = 10.2) were in 5th grade primary, 9 participants (17%, M age = 11.1) were in 6th grade primary, 13 participants (24%, M age = 12.8) were in 1st grade secondary, 8 participants (15%, M age = 13.6) were in 2nd grade secondary, 7 participants (13%, M age = 14.1) were in 3rd grade secondary, and 7 participants (13%, M age = 15.1) were in 4th grade secondary. Approximately 60% of all students in Group B were also in Group A.

2.3. Instrumentation

A paper-and-pencil test, completed anonymously, was developed and administered by the second author. This Spanish-language questionnaire consisted of 52 statements, requiring a self-reported rating on a 1–10 Likert scale, with 1–3 representing “definitely disagree,” 4–5 “disagree,” 6–7 “agree,” and 8–10 “definitely agree.” Statements were clustered into the following four categories: Factor 1 – physical health; Factor 2 – cognitive health; Factor 3 – emotional health; and Factor 4 – school performance. These Factors are consistent with the “focus areas” in Perú sanctioned by the Ministry of Education, specifically developing elements of the primary and secondary curriculum to include sports, critical thinking and decision making, management of emotions and stress, and mental and emotional strength as they relate to academic performance (Adler 2016).

2.3.1. Factor 1 – physical health

Factor 1 (F1) included 13 statements related to physical health, with students asked to rate their levels of tiredness, energy, sickness, quality of sleep, and athletic ability because of practicing Transcendental Meditation. For example, statement #3 of F1 was: “Tengo más energía” (I have more energy [as a result of practicing Transcendental Meditation]). The importance of physical health in primary and secondary school curricula has been discussed elsewhere (Harris 2019), including its association with brain functioning and cognitive health, such as memory, attention, and processing speed (Geertsens et al.

2016); practice of Transcendental Meditation has also been found to reduce stress and improve physical health, and hence why it has been incorporated into the curricula of many schools in 49 countries (Herani and Kumar 2015). Prior research indicated that in 520 Peruvian students, the normal score for F1 is $M = 6.15$, $SD = 1.7$ (Fergusson, Ortiz Cabrejos, and Bonshek 2022).

2.3.2. Factor 2 – cognitive health

Factor 2 (F2) included 10 statements related to cognitive health, with students asked to rate their memory, comprehension, and problem-solving ability because of practicing Transcendental Meditation. For example, statement #1 of F2 was: “Mejoró mi memoria” (My memory has improved [as a result of practicing Transcendental Meditation]). Cognitive health is associated with school performance (Liu et al. 2015) and evidence suggests practice of Transcendental Meditation reduces symptoms of ADHD, improves executive function, increases metacognition, and improves executive performance (Grosswald et al. 2008). Prior research indicates that in 520 Peruvian students, the normal score for F2 is $M = 6.46$, $SD = 1.7$ (Fergusson, Ortiz Cabrejos, and Bonshek 2022).

2.3.3. Factor 3 – emotional health

Factor 3 (F3) included 12 statements related to emotional health, with students asked to rate their aggression, affective relations, friendliness, and happiness because of practicing Transcendental Meditation. For example, statement #11 of F3 was: “Me siento más confiado en lo que hago” (I feel more confident in what I do [as a result of practicing Transcendental Meditation]). Research has established links between a child’s emotional health and their social and psychological wellbeing (Thomson et al. 2017) and improved emotional health, such as reduced depression, has been associated with practice of Transcendental Meditation (e.g. Elder et al. 2014). Valosek et al. (2019) similarly found increased social-emotional competencies in a second controlled study, and Bleasdale, Peterson, and Nidich (2019) found reduced levels of anxiety, depression, stress, and anger in a group who practiced Transcendental Meditation compared to a control. Prior research indicates that in 520 Peruvian students, the normal score for F3 is $M = 6.80$, $SD = 1.7$ (Fergusson, Ortiz Cabrejos, and Bonshek 2022).

2.3.4. Factor 4 – school performance

Factor 4 (F4) included 12 statements related to academic and general performance at school, with students asked to rate their satisfaction and efficiency at school, getting along with classmates, academic achievement and learning, and truancy because of practicing Transcendental Meditation. For example, statement #1 of F4 was: “Me siento satisfecho en mi colegio” (I feel satisfied in my school [as a result of practicing Transcendental Meditation]). School performance is a multi-faceted measure (Ng, Huebner, and Hills 2015) and earlier research had identified Transcendental Meditation as a positive contributor to learning and school performance (e.g. Nidich and Nidich 1989). Prior research indicates that in 520 Peruvian students, the normal score for F4 is $M = 6.75$, $SD = 1.7$ (Fergusson, Ortiz Cabrejos, and Bonshek 2022).

Development of statements used in the Factors was informed by prior international research findings using the lines-of-inquiry and research protocol outlined by Fergusson et al. (2019). The earlier work of Benn (2003) and Rosaen and Benn (2006) informed the

identification of key variables used in this study. Cronbach alpha coefficients computed for scale reliability within Factors and Factors in relation to each other and to the overall health and school performance construct (i.e. the combined score of all Factors) yielded internal consistencies of F1 $C_\alpha = 0.52$, F2 $C_\alpha = 0.60$, F3 $C_\alpha = 0.55$, and F4 $C_\alpha = 0.62$; $C_\alpha = 0.81$ for the average reliability between Factors, and $C_\alpha = 0.86$ for reliability of all Factors combined.

Validity in the present study was based on the theoretical basis upon which practice of Transcendental Meditation has been developed (e.g. Walton, Schneider, and Nidich 2005). Construct and content validity were maintained by following procedures outlined by Fergusson et al. (2019) when linking lines-of-inquiry with study questions and sources of evidence. Moreover, prior research conducted in Perú by these authors using the same test instrument suggests the 52-statement questionnaire, when tested on 91 (Fergusson, Ortiz Cabrejos, and Bonshek 2021b) and 520 (Fergusson, Ortiz Cabrejos, and Bonshek 2022) Peruvian students at five metropolitan, regional, and rural primary and secondary schools, is a valid form of instrumentation in this setting.

2.4. Procedure

Prior to the pandemic, students in Group A meditated together for 15 min at the start and end of each school day as part of their curriculum at IEPP. During the pandemic, when schools in Perú were closed and students studied from home while isolated, Group B continued to meditate for 15 min at the start and end of each school day as part of their curriculum, but now meditation was not carried out together in a group at the same time and in the same place but while participating online at a synchronized time. Completion of the questionnaire took students approximately 15 min.

Group A completed the questionnaire in November 2019 during one session per grade level as part of the students' normal class routine; Group B completed the questionnaire in December 2020 while in home isolation. Students in Group B were given access to the questionnaire via an online class study desk and were asked to complete the questionnaire and upload it to the study desk where it was accessed for analysis.

2.5. Data analysis

Descriptive and inferential statistics were used to analyze these data. The number and percentage of respondents, with means and standard deviations, who selected an answer on the definitely disagree > definitely agree scale were recorded for each Factor to answer RQs1 and 2. To answer RQs2 and 3, Factor scores were tested for difference on the combined scores of each Group using multivariate analysis of variance (MANOVA) and a *t*-test for independent means. Tukey's *post hoc* Honestly Significant Differences (HSD, *Q*) were computed for differences between Groups on all variables (Abdi and Williams 2010). These analyses were cross-tested for practical significance using Cohen (*d*) effect sizes.

2.6. Meditation framework

In keeping with Allbritton and Heeter's (2018) seven-element framework for researchers of meditation, we can therefore summarize the present research design and intervention

as: (1) *Individual* – primary and secondary students at IEPP aged between 10.2 and 16.3 years; (2) *Object* – individualized Transcendental Meditation (utilizing a specific mantra) taught by a qualified instructor from Instituto Maharishi de Ciencia y Tecnología del Perú; (3) *Experience* – meditating in a group for about 15 min while in a comfortable sitting position at the beginning and end of the school day (Group A) and meditating individually at home during a COVID-19 isolation period but still meditating together in group for about 15 min in an online meditation session with peers (Group B); (4) *Immediate effects* – based on the findings of extensive prior research, immediate effects of the meditation sessions for both Groups A and B can be predicted to have been: (A) experience of restful alertness or Transcendental Consciousness; (B) a reduction in mental activity and an increased state of restful alertness, indicated by an increase in EEG brainwave coherence; (C) a decline in metabolic activity, including biochemical activity, resulting in a state of deep physiological rest as indicated by reductions in breath rate, heart rate, blood pressure, and biochemical markers related to stress, such as blood cortisol and 5HIAA, while maintaining restful alertness; resulting in (D) after-meditation effects of reduced loneliness, anxiety, depression, and PTSD symptomatology; (5) *Engagement* – regularity of meditating twice per day in both the pre- and during-COVID-19 home isolation periods; and (6) *Outcomes* – longer term improved mental and physical health, and greater interest in learning and cooperation. According to Allbritton and Heeter (2018, 1), their meditation framework “supports (1) comparing different types of meditation interventions, and (2) understanding how meditation interventions lead to effects.”

2.7. Ethics

The pre- and during-COVID-19 phases of this research were sanctioned in October 2019 and December 2020, respectively by the Research Ethics Approval Committee of Maharishi Vedic Research Institute (MVRI), in accord with both MVRI’s *Code of Research Practice and Procedure* and the *Australian Code for the Responsible Conduct of Research* and were conducted under approval numbers MVRI-2019-16 and MVRI-2020-10. The project was countenanced in advance by the administration of IEPP and Instituto Maharishi de Ciencia y Tecnología del Perú.

3. Results

Table 2 presents the number and percentage of respondents in Groups A and B who selected an answer on the definitely disagree > definitely agree scale for each Factor. Table 2 shows that 47% of participants (25 out of 53) and 56% of participants (30 out of 53) in Group A agreed or definitely agreed that their physical health and cognitive health, respectively, had benefited from the practice of Transcendental Meditation before home isolation, while 100% of participants (54 out of 54) and 96% of participants (52 out of 54) in Group B agreed or definitely agreed they had benefited from the practice while in home isolation.

Table 2 also shows that 60% of participants (32 out of 53) and 57% of participants (30 out of 53) in Group A agreed or definitely agreed that their emotional health and school performance respectively had benefited from the practice of Transcendental Meditation before home isolation, while 96% of participants (52 out of 54) and 98% of participants

Table 2. Number and percentage of respondents in each response category \times Group \times Factor.

Factor	Response			
	Number and percentage of respondents (number/percentage definitely disagree)	Number and percentage of respondents (number/percentage disagree)	Number and percentage of respondents (number/percentage agree)	Number and percentage of respondents (number/percentage definitely agree)
Group A				
1	$n = 0, 0\%$	$n = 28, 53\%$	$n = 23, 43\%$	$n = 2, 4\%$
2	$n = 1, 2\%$	$n = 22, 42\%$	$n = 25, 47\%$	$n = 5, 9\%$
3	$n = 2, 4\%$	$n = 19, 36\%$	$n = 25, 47\%$	$n = 7, 13\%$
4	$n = 1, 2\%$	$n = 22, 41\%$	$n = 19, 36\%$	$n = 11, 21\%$
Average	$n = 1, 2\%$	$n = 23, 43\%$	$n = 23, 43\%$	$n = 6, 12\%$
Group B				
1	$n = 0, 0\%$	$n = 0, 0\%$	$n = 38, 70\%$	$n = 16, 30\%$
2	$n = 0, 0\%$	$n = 2, 4\%$	$n = 38, 70\%$	$n = 14, 26\%$
3	$n = 0, 0\%$	$n = 2, 4\%$	$n = 37, 69\%$	$n = 15, 27\%$
4	$n = 0, 0\%$	$n = 1, 2\%$	$n = 29, 54\%$	$n = 24, 44\%$
Average	$n = 0, 0\%$	$n = 2, 4\%$	$n = 35, 65\%$	$n = 17, 31\%$
Total Average	$N = 1, 1\%$	$N = 12, 24\%$	$N = 29, 54\%$	$N = 12, 21\%$

(53 out of 54) in Group B agreed or definitely agreed they had benefited from the practice while in home isolation.

These findings are further reflected in Table 3, which indicates the average responses to all Factors for Group A was 6.38 and for Group B was 7.62, meaning students in both Groups generally agreed with statements that Transcendental Meditation had benefited their health and school performance, both before (Group A) and during (Group B) the pandemic.

Table 3 also shows the average scores for participants in F1 Group A were 6.01 and Group B were 7.55, for F2 Group A were 6.40 and Group B were 7.53, for F3 Group A were 6.50 and Group B were 7.48, and for F4 Group A were 6.62 and Group B were 7.85. Scores on all Factors were normally distributed; skewness was parametric and kurtosis was mesokurtic (i.e. close to zero excess kurtosis): F1 = Skew[0.5], Kurt[−.01]; F2 = Skew[0.1], Kurt[0.3]; F3 = Skew[0.3], Kurt[0.1]; and F4 = Skew[0.1], Kurt[0.0].

Results from MANOVA indicate the differences between these scores were statistically significant for all Factors (for F1, $F = 9.00, p < .00001$; for F2, $F = 6.03, p < .00001$; for F3, $F = 4.77, p < .00001$; and for F4, $F = 6.08, p < .00001$). Similarly, the effect sizes between these two data sets were: F1, $d = 1.2$; F2, $d = 1.0$; F3, $d = 0.81$; and F4, $d = 0.71$, with an average overall effect size for all Factors of $d = 0.93$. An effect size of > 0.80 is considered “large”

Table 3. Means, standard deviations, MANOVA, and effect size results \times Groups and Factors.

Factor	Group				MANOVA		Effect Size <i>d</i>
	A		B		<i>F</i>	<i>p</i>	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
1	6.01	1.0	7.55	0.80	9.00	<.00001	1.2
2	6.40	1.2	7.53	0.86	6.03	<.00001	1.0
3	6.50	1.4	7.48	0.94	4.77	<.00001	0.81
4	6.62	1.4	7.85	0.81	6.08	<.00001	0.71
Average	6.38	1.2	7.60	0.85	—	—	0.93

(Orwin 1983). The findings in Tables 2 and 3 thereby answer RQ1 in the affirmative, and indicate the results from Group B are statistically higher than Group A, thereby answering RQ2.

Table 4 shows the means and SDs between age for each Factor, but no statistically significant difference was observed ($F = 0.33$, $p = .71$). Tukey's HSDs confirmed there was no difference in scores between any one age group and any other age group (i.e. within treatment variance), with ranges between $Q = 0.34$ ($p = .96$) and $Q = 1.10$ ($p = .71$). Table 4 also shows the means and standard deviations between gender, but no difference in scores was observed on any Factor, with ranges between $t = 0.07$ ($p = .93$) for F1 and $t = 1.5$ ($p = .12$) for F4.

Table 4 finally shows the means and standard deviations between grade level for each Factor, but no difference was observed ($F = 0.52$, $p = .71$). Tukey's HSDs confirmed there was no difference in scores between any one grade level and any other grade level, with ranges between $Q = 0.16$ ($p = .99$) and $Q = 1.92$ ($p = .65$). Therefore, no moderating effects on health and school performance by age, gender, or grade level could be attributed to these data, thereby answering RQ3 in the negative.

4. Discussion

This paper explored the relationship of primary and secondary school student experiences while in home isolation during the COVID-19 pandemic to the group practice of Transcendental Meditation at IEPP in Perú. The findings from 107 primary and secondary students indicate that irrespective of whether students practiced Transcendental Meditation in a group at the same time of day and in the same place (i.e. at school for Group A) or at the same time of day but separately (i.e. while online in home isolation for Group B), they report the practice has a salutary effect on health and performance at school. For example, an average of 75% of students agreed or definitely agreed the practice of Transcendental Meditation had a salutary effect on their physical health, cognitive health, emotional health, and school performance.

However, scores on each of the Factors were significantly higher for students in Group B during home isolation, 96% of whom reported salutary effects compared to 55% of Group A who did so. Further, Group A scores on all Factors were more consistently similar to normative data from Perú. Given Liu et al. (2020, 348) maintain "companionship is essential for children's normal psychological development and wellbeing," it is possible that being at home in isolation with family members provided a different type of companionship than at school, and as a consequence students felt more at ease and comforted at home, and therefore less stressed and anxious than would normally have been the case. According to Duan et al. (2020, 112), when "emotional support and spiritual guidance from family members, teachers, as well as other significant peers and adults in their lives could not be met due to home confinement... it adversely affected the mental health of children and adolescents," but this proposition does not appear to have been the case with students at IEPP either before or during the COVID-19 pandemic.

Earlier research had also indicated demographic variables, like age and gender, play a role in health outcomes of young people during the pandemic, but such a role for demographic moderators of psychosocial experience was not observed in the present study. Scores of physical health, cognitive health, emotional health, and school performance

Table 4. Means, standard deviations, MANOVA, and Test of Difference for age (top), gender (middle), and grade level (bottom) by Factor.

Factor	Age						MANOVA	
	10–11 (<i>n</i> = 19)		12–13 (<i>n</i> = 49)		14–15 (<i>n</i> = 39)			
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>F</i>	<i>p</i>
1	7.50	1.3	7.69	1.0	7.44	1.1	0.33	.71
2	7.55	1.0	7.55	0.8	7.54	0.5		
3	7.29	1.2	7.60	1.0	7.61	1.3		
4	7.83	1.1	7.92	1.0	7.75	1.0		
Average	7.54	1.2	7.69	0.9	7.52	1.0		

Factor	Gender				Test of difference	
	Girls (<i>n</i> = 56)		Boys (<i>n</i> = 51)			
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>t</i>	<i>p</i>
1	7.55	0.6	7.54	0.6	0.07	.93
2	7.47	0.7	7.61	0.7	0.6	.53
3	7.44	0.7	7.53	1.0	0.3	.72
4	7.69	0.6	8.03	1.5	1.5	.12
Average	7.53	0.7	7.67	0.9	—	—

Factor	Grade Level										MANOVA			
	5th Grade primary		6th Grade primary		1st Grade secondary		2nd Grade secondary		3rd Grade secondary				4th Grade secondary	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>F</i>	<i>p</i>
1	7.62	1.2	7.38	1.4	7.51	0.8	7.88	1.3	7.33	1.0	7.55	0.7	0.52	.71
2	7.73	1.2	7.38	0.8	7.35	0.7	7.75	1.0	7.27	0.7	7.81	0.3		
3	7.43	1.6	7.15	0.8	7.43	0.9	7.77	1.2	7.30	1.2	7.92	1.5		
4	8.01	1.2	7.66	1.0	7.90	0.8	7.94	1.2	7.50	1.2	8.00	0.9		
Average	7.69	1.3	7.39	1.0	7.54	0.8	7.83	1.2	7.35	1.0	7.82	0.8		

were unaffected by what were uniform student responses when co-varied for age, gender, and grade level.

A series of design shortfalls can be identified with the present study. Self-selection means participant reactivity cannot be ruled out. However, earlier findings from IEPP and four other primary and secondary schools in Perú, which triangulate with the data in this study, suggest that self-selection and participant reactivity did not play a major part in these results (Fergusson, Ortiz Cabrejos, and Bonshek 2021a, 2021b). The absence of a control group is a limitation, although inclusion of the pre-pandemic comparison Group A composed of members who were matched but nevertheless were somewhat different to Group B ameliorates this limitation, but further research needs to be conducted to rule out the impact of self-selection and participant reactivity as alternate hypotheses.

Future research in Perú could also be conducted to more rigorously test the health and school performance variables examined in this study, including not only their validity but their stability over time. Certainly, the instrument has been informed by well-documented and well-established theory, and parallel research using both the same instrument and comparable instruments (such as the Bar-On Emotional Quotient Inventory to measure emotional intelligence with students who practiced Transcendental Meditation used by Wendt et al. 2015) suggest acceptable levels of content validity, but further analysis would test the veracity of the questions and Factors of the present instrument.

Nevertheless, based on these preliminary findings it is not unreasonable to tentatively draw this conclusion: according to primary and secondary school students at Institución Educativa Privada Prescott in Perú, the practice of Transcendental Meditation by students who either meditate together in a group at school or in separate locations (effectively in a group but in coordinated online meditation sessions at the same time) appears to positively impact health and school performance, and such impact was not adversely affected as a result of home isolation during the COVID-19 pandemic.

This study, by examining the group effect of meditation during home isolation when coordinated in online sessions, considers a new approach to group practice of Transcendental Meditation by exploring its effect under conditions related to the COVID-19 pandemic. In this way, the present research explores new territory in the field of research on the effect of Transcendental Meditation and adds additional insight to the existing body of international research.

Disclosure statement

No conflicts of interest have been reported by the author(s).

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