ARTICLE

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INTRODUCTION

This article addresses relationality or whakawhānaukataka (herein we use the dialect of Kāi Tahu, a prominent South Island iwi, or tribe) and developing connections between people. We focus on these networks from a Māori (Indigenous peoples of Aotearoa New Zealand) perspective including the process of networking to find kin, establish connections and form positive relationships with people (and place)—something that appears to be elusive in modern, dis-connected, society. Indeed, the following literature review draws on research from New Zealand and internationally to highlight the steady decline of hauora (wellbeing), especially for rakatahi (youth), in turn creating concern for whānau (family) support networks like iwi (tribe), hapū (sub-tribes) schools and health authorities in New Zealand.[1,2]

The following review covers key health and wellbeing literature, developments in physical education (PE) and the use of a popularised model. Next, we briefly explain our proposed Teaching Games for Whakawhānaukataka (TG4W) intervention before we outline the study's Kaupapa Māori Theory (KMT) methodology and methods. The results and discussion of findings present the key themes that emerged from our analysis. Finally, we conclude by suggesting that our proposed TG4W model could be a way for rakatahi to reconnect with others, enhancing social relations and leading to better wellbeing outcomes, while also raising their heart rates through physical activity (PA) at the same time.

LITERATURE REVIEW

Globally, one network of which New Zealand is a part is the international Organisation for Economic Co-operation and Development (OECD), which promotes policies to improve both the social and economic wellbeing of people worldwide. The OECD is a forum where governments work together to find solutions to social, economic and governance issues. Across the OECD's members (primarily Global North countries), the Programme for International Student Assessment (PISA) tests the knowledge and skills of 15-year-old students across science, mathematics and reading subject areas.[3] Essentially, PISA tests how well students can problem-solve, think critically and communicate their ideas effectively, providing insights into how well education systems in OECD countries are preparing students for real-life challenges and future success.

New Zealand has participated in PISA testing since 2000 and, by cross-comparing results globally, for instance, policymakers can learn vicariously from other countries' experiences.[4] In addition to science, mathematics and reading, the 2022 PISA facts sheets for New Zealand reported other indicators.[5] For example, responses to the question of "how school life was experienced for 15-year-old students in NZ schools" were published. Results suggested that New Zealand students' sense of belonging at school and overall satisfaction with life were alarmingly negative. Other reports indicate that bullying in New Zealand schools is rising.[6] Indeed, in 2018 New Zealand was rated the second-worst in the OECD for bullying.[7] Since then, we have moved into first place as the worst country in the OECD for bullying.[8] In fact, post-COVID-19, New Zealand scored worse in 2022 (compared with 2018 results) in terms of students' feelings of loneliness (21%; up 3%) and awkwardness, or feeling "out of place" at school (28%; up 4%). These results are consistent with the national youth health and wellbeing survey 'What about Me?,' which showed that only 47% of the 7209 youth (Years 9–13) surveyed had helped others in their school or community within the past year.[9] Based on this body of evidence, there is an urgent need to explicitly address whakawhānaukataka (social wellbeing) within New Zealand's education system.[10]

In 2022, "feeling safe at and around the school" was another PISA indicator test used to gauge how safe school life was for students. Overall, fewer OECD students reported bullying in 2022, compared to 2018. Only 7% of students, for example, said that other students spread nasty rumours about them in 2022, compared to 11% in 2018. However, the New Zealand results demonstrated that 25% of girls (1 in every 4) and 32% of boys (1 in every 3) at school reported being the victim of bullying acts at least a few times a month.[11] For all others, the OECD average was 20% for girls (-5%) and 21% for boys (-11%). In New Zealand, 6% of students did not feel safe on the way to school; a further 6% reported not feeling safe in their classrooms at school, and 13% did not feel safe at other places at school (e.g., hallway, cafeteria, restroom)—3% higher than the OECD's (2023) average of 10%. Clearly, an issue exists with students feeling safe at New Zealand schools.[12]

As Jenkins (2021) argues, the decline of rakatahi hauora (youth wellbeing) accelerated during the COVID-19 pandemic. Indeed, in response to COVID-19, people were forced to stay indoors, isolated from whānau (family) and other social networks to ensure their safety. Despite successful COVID-19 isolation measures in New Zealand, an unintended outcome was an increase in perceptions of loneliness and the deterioration of mental health.[13] Young people, arguably, failed to manage with the severity of these isolation measures, many ending up unable to cope with the constraints that ensured safety amongst wider society.[14] While Te Momo (2022) argued that Māori were

nobly "resilient" (p. 74) in response to COVID-19, teachers trying to promote hauora, using Durie's (1985) Te Whare Tapa Wha (TWTW) model, faced challenges and difficulties including teaching taha tinana (physical wellbeing) and taha whānau (social wellbeing) concepts to students virtually.

The 2023 Voice of Rakatahi Sport NZ (2024) report, which captured the experiences of 20,000+ youth across 105 schools and 15 Regional Sports Trust areas, concurs with these findings. Indeed, results revealed that only 36% of rakatahi were "highly satisfied" with their in-school physical activity (PA) experiences. Further, of the PA types measured, both formal and informal, overall satisfaction was reportedly highest for "competitive sport" experiences at school and lowest for "PE classes." [15]

The implication is that something is happening in health promotion and PE classes at school that fails to connect with or engage youth. The top four areas for improvement that rakatahi raised in the Voice of Rakatahi (2023) survey included: a greater variety of activities on offer (29%); improved playing and training venues (28%); more accessible changing rooms and toilet facilities (26%); and better PE or sports uniforms (25%).[16] Further, almost two thirds (63%) wanted to be more physically active at school and those dissatisfied with their present experiences wished to "have more fun."[17] Obviously, work remains to be done to better cater to the needs of students in PE.

Given these issues, we wondered what solutions were possible to address whānaukataka (social wellbeing) more explicitly within New Zealand's PE education system, using Kī-o-Rahi as a tool. Traditionally, teaching and learning styles have evolved following changes in philosophy, psychology and the development of student-centered approaches. As Griffin and Butler argued, "new teaching–learning approaches have emerged to develop students' autonomy of thought and problem-solving skills."[18] In relation to online learning changes and how PE and health teachers have traditionally taught students, the challenges of COVID-19 required practitioners to pivot.[19] Given these complexities, we hypothesised that Bunker and Thorpe's Teaching Games for Understanding (TGfU) model might provide a potential framework which, if adapted, would allow for greater depth of knowledge (rather than understanding 'why or how' to play games).[20] In response, we conceptualised an explicit TG4W model intended to 'double down' on students' understanding of the importance of be(com)ing more relational.

Therefore, our focus now turns to the literature that analyses Western and Māori perspectives on health and wellbeing; and evolutions in PE including TGfU and kā taoka tākaro (Traditional Indigenous Games or TIGs).

WESTERN HEALTH PERSPECTIVES

Defining health is contested among academics, organisations and professionals worldwide.[21] The World Health Organisation (WHO) defines health as "a state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity."[22] Although this view considers holistic aspects, it also focuses on microscopic variables, or those viewable to the "naked eye." A criticism of this lens is that health is "illusionary," insofar as the majority of the world's population are categorised as "unhealthy."[23] Further, biomedical perspectives do not fully consider Indigenous views, in particular failing to recognise the intangible aspects of health such as wairua (spirituality) and relationships that Māori have with whakapapa (genealogy) and whenua (land).[24]

Currently, health indicators are defined by biopsychosocial metrics comprising three areas: 1) biological—physical health, genetics and disability; 2) social – living circumstances, education and relationships; and 3) psychological – self-esteem, social and coping skills.[25] While social wellbeing aspects are acknowledged, there is no apparent spiritual connection to health. Durie argues that, for Māori, this is the most fundamental dimension due to the unique relationships they have with whenua (land), whakapapa (ancestry) and people.[26] Likewise, Panelli and Tipa concur that health is not merely "physical, and mental," but that there are many interconnected layers including experiencing the natural world, spiritual wellbeing and cultural identity.[27] In New Zealand, definitions of holistic health cannot ignore these (neglected) elements that shape wellbeing, alongside more 'objective' health indicators. Thus, next we briefly outline how Māori conceive of wellbeing.

MĀORI PERSPECTIVES ON HEALTH

Arguably, Māori conceptions of health and wellbeing are more holistic compared to the WHO definition above. These debates are covered by prominent Māori health figures, including Professors Durie, Pitama and Baxter.[28] In the relevant literature, wellbeing comprises three consistent elements: 1) it is multi-dimensional; 2) whānaukataka (connections) leads to whakawhānaukataka (being relational); and 3) socio-political contexts—such as colonisation, racism and marginalisation or CRUMBS[29]—are also influential.[30] In contrast to Western ideas, Māori (and non-Māori, including New Zealand's Ministries of Health and Education) embrace and promote the Te Whare Tapa Whā (TWTW) model. Durie formulated this concept, which brings together wairua (spirituality), whānau (social wellbeing), hinengaro (mental and emotional wellbeing) and tinana (physical wellbeing), while acknowledging that connection to the whenua (land) is foundational (see Figure 1).[31]

Key to TWTW is spirituality (identity, belief systems and values), considered integral to cultural continuity practices and rituals—which McHugh and colleagues (2019) state are fundamental for Indigenous peoples' perspectives on holistic wellbeing globally.[32] Indeed, as Durie suggests, if wairua (spirituality) is lacking, then people are thought to lack "wellbeing and [are] more prone to

Figure 1. Durie's Te Whare Tapa Whā (TWTW) model of holistic wellbeing (1984). Model used with permission from the Mental Health Foundation.

disability or misfortune."[33] However, wairua (spirituality) is the dimension that is missing in the WHO's definition. While there are commonalities between these distinctive viewpoints, there are also nuances that are neglected. The following section speaks briefly to one distinct difference—specifically, how Māori are stigmatised within wider New Zealand society and the subsequent impacts on their wellbeing.
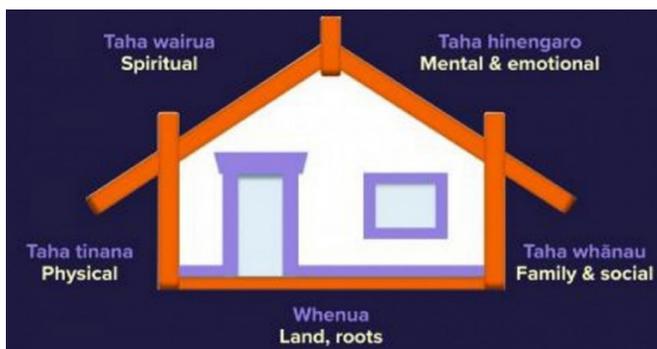
SOCIETAL STIGMA: ANTI-WHAKAWHĀNAUKATAKA

Māori represent 17% per cent of the total New Zealand population.[34] In postcolonial New Zealand, 'casual' racism occurs often, whether directed towards entire sub-groups or members within a sub-group; societal attitudes are dominated by a majority.[35] Deeply discriminating, social stigmas reduce people from a "usual person to a tainted, discounted one," revealing a "deviant condition identified by society that might define the individual as flawed or spoiled."[36] New Zealand-based research has revealed that Māori are exposed to "day-to-day" forms of institutional racism through stereotypes and media portrayals, causing them to feel anxious, ashamed and embarrassed to be Māori.[37] Trauma stemming from this stigma is not something new; it is inter-generational. In the early 1900s, for example, teachers at Native schools were strongly advised to discipline all children who spoke te reo Māori, leading to psychological deterioration in their sense of identity and self-worth.[38] As Ka'ai-Mahuta articulates, a

> child's native language [te reo Māori] is the primary form of expression of that child's thoughts and feelings. Therefore, language provides empowerment for a child. Language is the lifeline and sustenance of a culture. It provides the tentacles that can enable a child to link up with everything in his or her world. It is one of the most important forms of empowerment that a child can have.[39]

This demonstrates how impactful language is for rakatahi Māori. Classroom practices can actively encourage te reo Māori by using simple introductions and greetings, advancing to more complex expressions such as pepehā or mihimihi (formal introductions), promoting inclusive learning spaces that value diversity and showing others that New Zealand's Indigenous language matters.[40] Racism, expressed as verbal antagonism or physical aggression, transcends individuals and also affects institutions.[41] Thus, inter-generational trauma is repeated, reinforced and perpetuated by society's institutions—harnessing the distrust of some societal groups, which manifests in their children affecting taha whānau or social cohesion.[42]

For Māori to counteract the systemic institutional racism, stigma and stereotypes that supress their educational achievement, the entire sector must evolve and uplift the mana of Māori by increasing their visibility and participation within schools and specifically in the classroom content that is being taught.[43] The following section shines light on how this can be achieved, using an example from a Kī-o-Rahi unit of work which aims to encourage holistic understandings of social, spiritual, mental, emotional and physical wellbeing.

EVOLUTION IN PE PEDAGOGY

Developments in PE have seen educators and academics acknowledge that quality PE programmes can enhance PA, movement skills and enjoyment of life, and engender socialisation and social cohesion.[44] Increasingly, researchers are concerned with how PE is taught to students, with shifts away from teacher-centric approaches (TCA) to student-centered approaches (SCA).[45] This movement has shifted the focus away from content-focused styles that facilitated learning about 'why' and 'how' to play games, but not about who to play for and what to play for—an attempt to counter the argument that PE programmes are overly simplistic. As Cothran (2001) argued, physical educators know more about the factors that impede positive change, rather than those that promote it.[46] Inspired by previous PE (r)evolutions, we considered that the TGfU model could be modified to realise the present study's aims and objectives.

TEACHING GAMES FOR UNDERSTANDING:
MERELY UNDERSTANDING GAMES

Bunker and Thorpe's original TGfU model was considered an "evolutionary" approach.[47] For them, the "primary purpose of teaching any game should be to improve students' game performance and to advance their enjoyment and participation in games, which might lead to a healthier lifestyle."[48] However, a kaupapa Māori theoretical position might contest this order. Thus, we have adapted their model to assert a TG4W pedagogy that elevates healthy lifestyles, first and foremost, via participation and enjoyment in games (e.g., Kī-o-Rahi), an approach that might then lead to "improved game performance" in the future. Ultimately, in contrast to Bunker and Thorpe's TGfU model, our modified TG4W model prioritises whakawhānaukataka over performance measures, and does not leave healthy lifestyles to chance. Indeed, we doubled down on 'understanding'— rather than just asking 'why or how' to play games better and improve students' game performance. This is not an holistic approach.

Another narrow intention of the TGfU model was to implement an approach that: 1) increased physical activity levels to enhance physical wellbeing; 2) improved game performance; and 3) made PE enjoyable.[49] Clearly, two of these outcomes relate to tinana –enhancing physical wellbeing and making games (PE) more fun and enjoyable. Meanwhile, TWTW's other dimensions are neglected or outright dismissed.

TEACHING GAMES 4 WHAKAWHĀNAUKATAKA (TG4W):
DOUBLING DOWN ON UNDERSTANDING

Pedagogically, the TGfU model is founded on the four REST principles of games: representation (simpler game forms that 'represent' elements of the real game); exaggeration (manipulating game rules to over-exaggerate particular strategies or skills); sampling (trying different game forms with similar strategies); and tactical complexity (incremental shifts from simpler game forms to more complex tactics).[50] By contrast, our Māori-fied TG4W model is founded on the four pedagogical principles found in Ngā Hau e Whā o Tāwhirimātea (NHWT).[51]

Translated, NHWT means the "four winds of Tāwhirimātea." A culturally responsive framework, it was developed for the tertiary education sector, integrating strategies to assist educators in becoming culturally competent practitioners. The NHWT four-winds principles are: whānaukataka (relationships); manaakitaka (an uplifting ethic of care); kotahitaka (unity); and rakatirataka (student agency and leadership). They encourage educators to rethink their approaches when engaging Māori learners, to revise and modify teaching strategies and, when required, to question their own assumptions and dispositions.[52] They are designed to empower and inspire educators to be flexible and to broaden and deepen their culture of care in educational settings. At NHWT's core is the aspiration for improved oranga (health, wellbeing). So, we adopted this methodology.

First, whānaukataka is about being relational and developing close connections between people. The root of whānaukataka is whānau (family, kin), or close friends considered as family. Educators enhance this cultural value by creating and supporting a greater sense of belonging through nurturing collective, shared values among learners. An important consideration in achieving this aim is recognising all learners' cultural and personal identities. Second, manaakitaka (ethic of

care) embraces hospitality, kindness, generosity and support in learning settings. For Māori, manaakitaka is characterised by expressing generosity and showing respect for others.

Kotahitaka (unity) is about creating cohesion, solidarity, togetherness and collective social action—for example, when learners feel that they belong to something bigger than themselves. Strategies to achieve this include integrating waiata (songs) and karakia (prayer) into learning or developing a shared group (team) narrative. Often these experiences help learners understand and consider team dynamics and wider societal issues. Rakatirataka (agency and leadership) requires educators to facilitate autonomous settings where learners are self-determined to take ownership and self-manage their learning priorities. Coaches, for instance, create opportunities for players to assume leadership roles within teams, developing their agency, which is key to creating unity. Like teachers, learners should regularly evaluate themselves, their educators (coaches) and peers (teammates), and have a say in shaping their next 'work on' areas.

These NHWT principles are interrelated because the four winds are co-dependent and, unlike the TGfU model, they do not imply a linear sequence; they all contribute equally to creating balance, a holistic approach, towards culturally responsive teaching and learning.[53] Therefore, from a kaupapa Māori position, it made sense to employ these principles in our Māori-fied TG4W model and in our Kī-o-Rahi unit of work as an intervention, as we explain below.

KĀ TAOKA TĀKARO AND NHWT

Kā taoka tākaro (treasured games) is a term for traditional Māori games, handed down from our tīpuna (ancestors). Brown argues that taoka tākaro can enhance wellbeing by virtue of the physiological demands required to play high-intensity games.[54] However, what makes TIGs distinctive, compared to other games, is that they also prioritise sociological and philosophical ideas. In these traditional games, interconnections between performers and tīpuna, cultural values and norms are required to play, and values like whakawhānaukataka and kaitiakitaka (guardianship) are taught explicitly through the accompanying pūrākau (narratives).

Our tīpuna used pūrākau to deepen our understandings of knowledge about creation, the universe and our place within it. However, due to colonisation, this depth of knowledge deteriorated as its mana (prestige) was diminished.[55] Indeed, assimilation policies ensured that Māori TIGs such as Kī-o-Rahi were actively discouraged, and Māori were introduced to colonial games like rugby and cricket. As researchers, we taught Kī-o-Rahi the same way our tīpuna would have, using pūrākau, showing that they are more than mere myths—they are an exchange of mātauraka Māori (traditional Māori knowledge) across the generations.[56]

Despite its revitalisation, there are few peer-reviewed, published studies of Kī-o-Rahi. There are some books and a few journal articles, most authored by Kī-o-Rahi expert Harko Brown.[57] While some of the literature is "grey,"[58] other studies are emerging.[59] However, this research is related to the physiological demands of Kī-o-Rahi on high school players, suggesting that the game has similar physiological demands to sports like rugby 7s. As with majority research, there is a focus on the physical elements of the game. Again, wider conversations about the potential for Kī-o-Rahi and other TIGs to deliver additional outcomes, such as social wellbeing and other holistic benefits, is not comprehensively covered in the literature. This study contributes to filling this knowledge gap.

METHODOLOGY

Kaupapa Māori research affirms Māori knowledge, philosophies and practices as valid and legitimate.[60] Pihama et al. state that Kaupapa Māori theory provides a platform for Māori to be unapologetically Māori by developing and sustaining educational outcomes while living in a colonial society.[61] In designing the present study, it was important to consider cultural diversity and to assess how students worked together, encouraging them to think, understand and communicate in their class and school settings. As a result, this research employed kaupapa Māori to inform our study's theoretical framework, to implement cultural practices (TG4W) and teachings (NHWT) developed *by* Māori (researchers) *for* and *with* participants, including Māori, to promote hauora (TWTW), applying Māori values such as whakawhānaukataka (relationality) and manaakitaka (hospitality).[62]

Research objectives

The following section presents the study's aim and objectives, providing insight into the selection of methods, including the pūrākau from which Kī-o-Rahi originates. Fundamentally, this study aimed to: 1) develop deeper understandings of Kī-o-Rahi; 2) use Kī-o-Rahi to enhance rakatahi understandings of hauora, using TWTW; 3) identify the wellbeing needs for rakatahi Māori to thrive in education settings; and 4) gather accurate information to determine whether Kī-o-Rahi (taught via the TG4W model) is an effective way to teach/improve rakatahi hauora.

Research aims

Our research sought to identify: 1) how PE/ PA pedagogy can be modified to better cater to Māori; 2) if a modified 'TGfU' model, which incorporated Māori pedagogical principles (i.e., TG4W), promoted social wellbeing and hauora more explicitly; and finally, 3) if Kī-o-Rahi was useful in helping rakatahi to better understand hauora (TWTW) more broadly and improve their holistic wellbeing.

Study Design methods

Ultimately, to meet these aims and objectives we designed a Kī-o-Rahi four week unit to teach rakatahi about social wellbeing (to be followed by TWTW's three other hauora dimensions). The study mixed our qualitative participant-observation reflections with quantitative data. The qualitative data was gathered by all four of the authors who, as "participant–observers," reflected deeply after each lesson that they delivered. The WHO-5 survey responses represented the quantitative data, which was collected by only one of the classroom teachers both before and after their four Kī-o-Rahi lessons. Each lesson emphasised a TWTW cornerstone, beginning with whakawhānaukataka (social wellbeing) to build rapport between the researchers (participant–observers) and the participants (students).

Participants

The researchers (N = 4) debriefed by reflecting deeply after each of their four Kī-o-Rahi sessions across the three classes; these comprised a primary school with a group of Year 6 students (N = 25; 10-11-year-olds); and a college with a Year 7 class (N = 25; 12-13 year-olds) and a Year 10 class (N = 20; 15-16-year-olds, in a bilingual te reo unit). Only the Year 7 classroom teacher completed the pre- and post-unit WHO-5 questionnaire with their class, because it was built in as a

part of their health unit for the term (N = 21). However, all qualitative data were gathered through our recorded participant-observations made across the 12 Kī-o-Rahi lessons. Overall, this study engaged over 70 participants and included a dozen deep debriefing reflections.

Data Collection and Analysis

The Year 7 teacher administered the WHO-5 survey with students before our first Kī-o-Rahi lesson and again after the last lesson. According to Topp et al. (2015), the WHO-5 is a validated short questionnaire with a highly applicable generic scale comprising of five simple, non-invasive questions measuring the subjective wellbeing of respondents. The WHO-5 considers positive wellbeing items including the following statements: (1) "I have felt cheerful and in good spirits;" (2) "I have felt calm and relaxed;" (3) "I have felt active and vigorous;" (4) "I woke up feeling fresh and rested;" and (5) "my daily life has been filled with things that interest me." Respondents are asked to rate each statement from 0 (at no time) to 5 (all of the time). Raw scores (up to 25) are multiplied by 4 to total out of 100. For ethical purposes, the authors did not gather this data. Later, however, we were granted access to an anonymised data set to assess whether the lessons (intervention) delivered had led to any tangible changes in the students' social, spiritual, mental/ emotional and/ or physical wellbeing.

This quantitative data was analyzed using a Microsoft Excel spreadsheet to offer descriptive (as opposed to statistically significant) results, which are presented in the following section in Tables 1 and 2. Both quantitative (WHO-5 survey) and qualitative (participant–observer reflections) data were analysed separately as sub-groups and then later compared and contrasted. Together, we reflected collectively and deeply upon the observations that we made across the 12 sessions in total (i.e., four Kī-o-Rahi lessons at three different Year levels in two schools).

Protocol and intervention procedure

The first Kī-o-Rahi lesson started with whakawhānaukataka (relationship building) to facilitate trust and rapport with the students. Thereafter, each session reviewed the previous week's teachings to reinforce learning. Questions included "which aspect of hauora was last week's focus; in what way did last week's learnings help you this week?" and "how are you feeling today?" These prompts were intended to gauge how well the students understood and/or had applied the TWTW focus over the past week.

As participant-observers, we paid close attention to see if the students not only enjoyed the games, but were able to apply the TWTW learning focus. As deliverers of hauora learnings via four one-hour Kī-o-Rahi sessions (covering social, spiritual, mental/emotional and lastly physical wellbeing) we achieved two vital goals. Firstly, through the preview-review process with students, we could determine the depth of their hauora understandings and assess if they perceived TWTW as a multi-dimension construct. Secondly, we were also able to assess, via our 'cultural insider' participant-observer reflections, whether the students' involvement in playing Kī-o-Rahi solidified their understanding and appreciation of mātauraka Māori (traditional Indigenous knowledge) and manifested as specific TWTW-dimensional behaviours.[63] In reviewing each lesson, the students were asked to express their ideas with us about what they thought could happen if any of these elements were neglected. Their insights were also recorded in 'hindsight' by the research team during our own, separate debriefing reflections and in-depth discussions.

Results

The pre-test results in Table 1 show that under a quarter (5/21) of students (24%) reported feeling "cheerful and in good spirits" all the time. Over half (57%) felt this way "most of the time" though. However, this 'trend left' (all/most of the time) was not repeated in their self-reported states of feeling "calm and relaxed," where a third (7/21) felt this way. The majority (43%) felt this way over half the time, while 24% (5/21) said they felt calm and relaxed less than half the time. Unsurprisingly, given the physical nature of the intervention, the majority (76%) trended left and felt "active and vigorous" most (7/21) if not all of the time (9/21). Under half (47%) said they woke feeling "fresh and rested" all or most of the time, while 57% said that their "lives were filled" with interesting things "most" or "all of the time" at the pre-test juncture.

The post-test results in Table 2 show a marked 'trend left' across all WHO-5 questions. Indeed, 85% of students felt "cheerful and in good spirits" all or most of the time. Similarly, the incidence of "feeling calm and relaxed" almost doubled, to 62%. Again, the 'active' nature of our intervention saw high scores (85%) reported by students, up 9% from 76%. States of feeling "fresh and rested" increased from under half up to almost two thirds (62%). Finally, over three quarters (76%) reported that their life, post-intervention, was "filled with things that interest me" "most" or "all of the time" at that juncture.

When we analysed their WHO-5 scores collectively, the pre-test mean average was 57% across the 21 students. The range was from 28% (lowest score) to 77% (highest score), a difference of 49%. Four weeks later, the WHO-5 post-test mean average was 83%, a noticeable increase. Again, when we considered the range, the lowest WHO-5 score was 60% and the highest was 100%, still a 40% difference between these outliers. Individually, results showed an increase ranging from 4% (lowest) to 48% (highest) and an overall average of 28% growth.

Likert scale	All the time	Most of the time	More than half the time	Less than half the time	Some of the time	At no time
'Raw' scores from 5 (highest) to 0 (lowest)	(5)	(4)	(3)	(2)	(1)	(0)
Q1. I felt cheerful and in good spirits	5	12	3	1		
Q2. I have felt calm and relaxed	3	4	9	5		
Q3. I have felt active and vigorous	9	7	3	1	1	
Q4. I woke up feeling fresh and rested	7	3	7	2	1	1
Q5. My daily life has been filled with things that interest me	6	6	6	3		

Table 1. WHO-5: Number of students' responses before the Kī-o-Rahi sessions (pre-test).

Discussion

Our study aimed to assess whether PE pedagogy could evolve to better cater to the needs of Māori students. We investigated whether a modified TGfU model, employing Māori pedagogical principles (NHWT), promoted whānaukataka (social wellbeing) explicitly. Overall, our objective was to see if Kī-o-Rahi (using TG4W) was a useful way to help rakatahi understand hauora more deeply, leading to improved, albeit self-reported (WHO-5), outcomes in holistic wellbeing. This section discusses our findings in relation to these aims.

Likert scale	All the time	Most of the time	More than half the time	Less than half the time	Some of the time	At no time
'Raw' scores from 5 (highest) to 0 (lowest)	(5)	(4)	(3)	(2)	(1)	(0)
Q1. I have felt cheerful and in good spirits	10	8	3			
Q2. I have felt calm and relaxed	6	7	6	1		1
Q3. I have felt active and vigorous	13	5	3			
Q4. I woke up feeling fresh and rested	7	6	6	2		
Q5. My daily life has been filled with things that interest me	7	9	4	1		

Table 2. WHO-5: Number of students' responses after the Kī-o-Rahi sessions (post-test).

As Tables 1 and 2 demonstrate, despite our limited quantitative results (N = 21 students who completed both pre- and post-tests, taking account of absences), there was an obvious shift in terms of their self-reported feelings across all five WHO-5 questions. While the number of participants (N = 21) and self-reporting are limitations, which we acknowledge, our qualitative reflections based on our triangulated (across three sites) participant-observations concurred with these quantifiable results. In reflecting on the study results, we observed similar shifts and trends across the entire cohort of 70+ students who participated in our intervention. Our collective experiences working with and speaking to rakatahi about their past experiences in schools with learning about hauora (TWTW pre-intervention) was rich and revealing. For example, some schools had outsourced this learning to high-profile local athletes and other external providers. When we asked students "what key points do you remember?," little information was recalled regarding TWTW or the deeper meanings of hauora. Interestingly, they only recounted the activities that they had competed in or had completed, rather than the actual hauora concepts that were taught. These findings reinforced the view that their (past) practices were not fully engaging or connecting with the students.

Given this background, we drew on the 'evolutionary' TGfU model, as it had recognised deficiencies in pedagogy previously and encouraged a shift towards understanding and appreciating the 'why' and 'how' of playing games.[64] Initially, we hypothesised that a TG4W approach could promote hauora for all students, and in fact 'double down' on understanding more than just the game. TGfU develops a lineated ,'logical' sequence of understanding games.[65] However, we wanted students to learn more than just 'why' or 'how' to perform better in games. Thus, we found that our TG4W (Māori-fied) model provided an enriching and engaging way for students to better understand and enhance their hauora throughout our Kī-o-Rahi intervention.

As participant-observers and Kī-o-Rahi educators, we developed learning experiences and adapted PE models (TG4W) that made abstract concepts (TWTW) more accessible. Underpinned by the NHWT pedagogical principles, our Māori-fied TG4W model allowed students in their neural plasticity prime to better understand, appreciate and absorb some relatively old, yet nuanced concepts. Based on our findings, we encourage educators, as agents of social and cultural change in health and education outcomes, to create similar opportunities that will permanently impact rakatahi hauora in New Zealand. Innovations like our Kī-o-Rahi unit and TG4W model helped students absorb and retain abstract concepts, underlining that we must take advantage of this pivotal time in their lives to influence and enhance their hauora.

Within PE contexts, using te reo Māori is easily achieved by introducing initiatives like the Kī-o-Rahi unit into the mainstream content, where playing positions and equipment have te reo Māori names and meanings. The use of Kī-o-Rahi and sharing pūrākau acts as a vehicle to promote inclusion, diversity and appreciation of the cultural identity of ethnic minorities. Dominant majority groups can play their part to facilitate improved social cohesion, with the aim of achieving a common goal towards unifying both worldviews. Oranga (wellbeing) can be enhanced—not only by scoring points or hitting the tupu (target), but also through whānaukataka as well as teamwork. Based on our exploratory findings, the intervention provided rakatahi with the tools to better understand hauora (TWTW), improving their social connectedness.

CONCLUSIONS

Rakatahi Māori still experience inter-generational trauma daily, among many other impacts of colonisation, despite the promise of "partnership, protection and participation" made in Te Tiriti o Waitangi in 1840. These issues, including the ensuing stigma, day-to-day racism and stereotypical assumptions, have detrimentally affected their hopes and aspirations, including lower academic achievement for some Māori. In addition, higher unemployment, poorer health outcomes and overrepresentation in imprisonment statistics all serve to further undermine our bodies of knowledge and cause us to remain diminished or disregarded by the mainstream. Clearly methods used in mainstream PE and health settings, especially for teaching hauora, are not working. Indeed, as we found, in the pre-intervention phase of our study the students failed to articulate the deeper or sometimes even superficial meanings of TWTW.[66]

By modifying the popularised TGfU model, we developed a TG4W adaptation which allowed a fresh way to learn "more than just the game." Getting outside the gymnasium walls and playing Kī-o-Rahi in and around green and blue spaces demonstrated improvements in students' whānaukataka and overall hauora across the four weeks. Indeed, the study's results revealed that Kī-o-Rahi and

a TG4W approach enhanced students' hauora through socially inclusive settings where Māori and non-Māori learners fully flourished in their interactions with each other. Implementing TG4W into PE practice forms a symbolic partnership and, by doing so, enables mātauraka Māori to take a strong role and PE to have greater cultural responsiveness, as well as providing protection in schools and classrooms, together inspiring innovation and creativity.

While the application of the NHWT principles that underpinned TG4W worked favourably on this occasion, more evidence is required to demonstrate that they can be successfully applied in different educational contexts. Future research directions could consider multiple pathways—for instance, applying the NHWT principles in other curriculum areas, or further studies employing and testing the TG4W model in PE and sport settings.

For this study, however, it is possible to say that TG4W helped all learners, regardless of their ethnicity, to thrive as the new (old) innovations employed move beyond simply learning the 'why' and 'how' to play a game better. Thus, in 'doubling down' on this 'understanding,' we argue that students' hauora should not be left to chance, at the expense of performing better in games. Indeed, quite the reverse; social cohesion, spiritual awareness, cognitive understandings, appreciation of feelings and emotions and improving on the physical requirements of the game (in that order) together lead to enhanced wellbeing. As for playing the game better? We believe that if all these other outcomes are prioritised, then that one will take care of itself.

Supervised by Assoc. Prof. Jeremy Hapeta, **Marcus Campbell** (Te Atiawa, Ngāti Māru) was awarded a He Ngaru Paewhenua summer internship after completing a degree in sport and exercise sciences, where he combined his passions for exercise physiology, hauora Māori and academic research. Now a second-year medical student at the University of Otago›s School of Medicine, he continues to apply his knowledge in his medical training, with the ambition of improving health outcomes throughout Aotearoa. His leadership has been recognised through his presidency of the Otago Medical Students' Association as well as the Pūtahi Manawa, Arthritis NZ, and Division of Health Sciences Excellence scholarships.

Nick Parata (Ngāti Raukawa, Ngāti Toarangatira, Te Atiawa) holds degrees from the Centre of Indigenous Science and School of Physical Education, sport and exercise sciences at the University of Otago. His undergraduate degree led him towards postgraduate Honours, supervised by Dr Chanel Phillips and Professor Jim Cotter, which focussed on Kī o Rahi as a tool to assess components of fitness. He later undertook a Ngā Pae o te Maramatanga funded summer internship, supervised by Assoc. Prof. Hapeta, that focussed on flourishing mental wellbeing for rakatahi Māori. His passion for this subject stems from his own immersive experiences playing Māori hockey, including in the New Zealand senior Māori and junior Tāne hockey teams.

Connor Eastwood (Ngāti Raukawa) is an undergraduate researcher studying for a Bachelor of Science at the University of Otago. Prior to completing his degree in sport and exercise science, he was awarded a He Ngaru Paewhenua internship, supervised by Dr Hapeta. Connor is interested in improving youth knowledge of Māori health through traditional Māori sports. His passions, which include developing Māori culture through youth, have led him to a position in Physical Education New Zealand's rakatahi leadership group, where he focuses on the importance of physical education participation for youth in Aotearoa. He aims to pursue a future where the health of Māori youth in particular is upheld through active exposure to taoka tākaro.

Jeremy Hapeta (Ngāti Raukawa) (ORCID ID: https://orcid.org/0000-0002-8853-1572) is an associate professor of Māori physical education and wellbeing at Te Kaupeka Oranga, the Faculty of Health, University of Canterbury. Previously, he was a senior lecturer at the University of Otago. Before academia, he was a fully registered teacher in primary, intermediate and secondary schools in New Zealand and overseas. His research interests include kaupapa Māori methods and methodology, Indigenous perspectives on sport for development and sport pedagogy. He participates in academic groups working with Sport New Zealand and also served on NZ Rugby's Training, Education and Development framework working group. In governance, he is a Sport Manawatū board member and has previously served on two school boards of trustees.

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