Protective factors for physical activity in Pacific adolescents: A quantitative analysis from the Youth19 Survey

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Abstract

Introduction: Physical activity is essential for health in adolescence, however less than half of adolescents in Aotearoa New Zealand are classified as being sufficiently active for health benefits. Pacific adolescents are less likely to be classified as sufficiently active compared to their peers from other ethnic groups. This study explored the association between physical activity in Pacific adolescents and potential protective factors.
Methods: This quantitative study uses data from the Youth19 Rangatahi Smart survey. A bivariable logistic regression analysis assessed the relationship between seventeen independent variables and physical activity participation in the past week. Thereafter, a multiple variable stepwise logistic regression analysed the variables significantly associated with physical activity.
Results: In the bivariable logistic regression analysis, the significant associations were gender, well-being score, belonging to a cultural group, belonging to a group outside of school, spiritual connectedness, school decile (4 & 8), and the belief that exercise is important. In the multivariable stepwise logistic regression analysis, two factors remained significant: belief that exercise is important (odds ratio = 4.896, 95% CI=3.268, 7.337, p <.001) and belonging to a group outside of school (odds ratio = 2.048, 95% CI = 1.397, 3.003, p <.001).
Conclusion: Overall, this study offers insights into the protective factors associated with physical activity in Pacific adolescents. Future qualitative

research is needed to gain a more in-depth understanding of these protective factors within Pacific communities to help improve their health and well-being.

Keywords: Youth; Health Promotion; Self Determination Theory; Theory of Planned Behaviour

Introduction

Physical activity is widely recognised as essential for good health (Posadzki et al., 2020). The World Health Organization (WHO) recommends that even small amounts of physical activity are better than none (Bull et al., 2020). Benefits include improved cardiovascular fitness, body composition, bone health, and mental wellbeing (Bull et al., 2020). Physical activity also helps prevent and manage noncommunicable diseases such as heart disease, stroke, type 2 diabetes, cancer, dementia, and depression (Posadzki et al., 2020). For adolescents, the recommended level is an average of 60 minutes of moderate to vigorous physical activity daily, with additional benefits beyond this (Bull et al., 2020).

Adolescence is a key developmental stage, making it important to establish healthy habits (World Health Organization, 2014). Globally, physical activity levels among children and adolescents are low (Aubert et al., 2022). In Aotearoa New Zealand, fewer than half of adolescents meet recommended activity levels. Pacific adolescents are less likely to be sufficiently active compared to other ethnic groups (Wilson et al., 2023). In this article, 'Pacific' refers to the diverse Pacific communities in Aotearoa, including Samoan, Cook Islands Māori, Tongan, Niuean, Fijian, Tokelauan, Tuvaluan, and Kiribati peoples (Ministry for Pacific Peoples, 2020). Pacific peoples are a youthful population, with 46.1% under 20 years. While many Pacific students are thriving in family, school, and church settings, they also face challenges such as poverty, deprivation, and racism (Veukiso-Ulugia et al., 2024). There is limited research on recreational physical activity among minority ethnic groups in Aotearoa, including Pacific peoples (Posadzki et al., 2020). More research is needed to understand what supports Pacific adolescents' health and wellbeing.

Physical activity participation is influenced by factors across the socio-ecological spectrum, including policy, settings (e.g., school, home, neighbourhood), social and cultural environments, and individual preferences and demographics (Hinckson et al., 2017; Sterdt et al., 2013). Several theories help explain physical activity behaviour. These include the Transtheoretical Model (TTM) (Prochaska et al., 1992), the Theory of Planned Behaviour (TPB) (Ajzen, 1991), and Self-Determination Theory (SDT) (Fortier et al., 2012) which highlights autonomy, competence, and relatedness as key motivators. The Health Belief Model (HBM) and Theory of Reasoned Action (TRA) also share similar concepts (Dishman et al., 2010).

Indigenous and Pacific models of health

Indigenous health models prioritise Indigenous worldviews, values, and traditions (Chino & DeBruyn, 2006). These models support Indigenous communities in Western societies by integrating cultural concepts that promote empowerment (Dishman et al., 2004). Indigenous frameworks go beyond individual needs, taking a collective approach that includes family, community, society, and the environment (Curtis, 2016; Kokaua et al., 2020; Savila et al., 2022). A key Pacific health framework is the 'Fonofale' model by Fuimaono Karl Pulotu-Endemann (2009). It uses the metaphor of a Samoan house, with family as the foundation, spiritual and mental aspects as posts, and culture as the roof. Surrounding the house are the environment, context, and time. This model reflects the collectivist values central to Pacific health.

Pacific-focused health research must include holistic principles such as collectivism, social connectedness, belonging, spirituality, and cultural values (Health Research Council of New Zealand, 2005; Savila et al., 2022). These principles help Pacific adolescents engage in physical activity and achieve positive outcomes (Savila et al., 2022). Matenga-Ikihele (2021) highlights the importance of social inclusion in health interventions for Pacific peoples. The Fonofale model supports community-based approaches and holistic assessments, promoting wellbeing across multiple domains. In a study by Savila et al. (2022) the Fonofale model was combined with Te Whare Tapa Whā (Durie, 1999), to explore physical activity participation in a Pacific-led health programme. In this study the intervention focused on broader health and wellbeing in the management of diet and weight.

Health paradigm

Deficit-based health research often overlooks key aspects of Indigenous health and reinforces stereotypes and marginalisation (Curtis, 2016; Kanaʻiaupuni, 2005; Kokaua et al., 2020). In contrast, strengths-based approaches highlight the value of Pacific frameworks and cultural knowledge. These approaches help identify what works well for Indigenous communities and support successful health initiatives (Curtis, 2016; Kanaʻiaupuni, 2005; Kokaua et al., 2020).

Physical activity is vital for health and wellbeing. However, Pacific adolescents in Aotearoa face inequities in physical activity, often due to deficit-based approaches. Pacific models and values offer culturally relevant ways to address these challenges. This study uses a strengths-based approach and the Fonofale model to explore protective factors that support physical activity among Pacific adolescents, drawing on data from a large national study.

Methods

Study design

This was a cross-sectional quantitative study of factors associated with physical activity drawing from the Youth19 dataset. Candidate protective factors were identified from the Fonofale model (Pulotu-Endemann, 2009) and extant literature.

Survey design and characteristics

The Youth19 Rangatahi (Youth19) Smart Survey is the most recent cross-sectional survey in the Youth2000 series. A full copy of the survey including detail on sampling, exclusions, non-responders, and survey development is available elsewhere (Fleming et al., 2020) and methods relevant to this study are briefly outlined below. The Youth19 survey captures information across 11 key topics (school, ethnicity and culture, home life, injury and violence, sport, work and online time, sex and sexuality, addictive behaviours, neighbourhood and spirituality). In 2019, the survey was conducted across Auckland, the Northland and Waikato regions. The eligibility criteria included fully integrated schools such as co-educational, single-sexed, private and public schools. Exclusion criteria consisted of schools with fewer than 50 pupils and specialist schools. Schools from the dataset that were not included in the randomisation process (so all were eligible) were state schools that operated with a Māori-based philosophy (Kura Kaupapa Māori, of which all were invited). Overall, 169 schools were eligible for inclusion (161 mainstream and eight Kura Kaupapa Māori), with 86 invited to partake (78 randomly selected mainstream schools, including two trial schools and six Kura Kaupapa Māori). In total, 45 mainstream and four Kura Kaupapa Māori agreed to participate, resulting in a total of 49 schools. In mainstream schools with more than 150 students in each year level, a random sample of 30% of students was invited from the school roll. In schools with less than 150 students, at least 30 students were randomly selected. All students that attended Kura Kaupapa Māori schools were also invited to participate. The total number of mainstream students invited to participate was 12,359, of whom 7,374 completed surveys (60% response rate) and 486 were invited to participate from Kura Kaupapa, with 347 participating (71% response rate).

Consent for participation was approved by the principal (or the head of the board of trustees) of each eligible school. From the school roll, students were randomly assigned and given information about the survey methods, consent and contact details. Information was provided in Te Reo Māori and English to the schools and was sent to caregivers and parents of students in school years 9-13 (approximately ages 13-17 years). Parents and caregivers also had the opportunity to withdraw their child(ren) from participating in the survey, and students had the opportunity to withdraw from the survey. Responses were anonymous, and privacy was maintained throughout. Participants had access to headphones to listen to the introductory video, which allowed them to hear their questions and answers being read aloud.

The survey was available in both Te Reo Māori and English. The survey was designed to be completed in 50 minutes; however, if students required more time, they were allowed to stay on to complete the survey. Ethics approval was granted by the University of Auckland Human Participants Ethics Committee (UAHPEC #022244).

Measures

The measures from the Youth19 survey used in this research are described below. All data were saved in a Microsoft Excel spreadsheet and then imported onto IBM SPSS for analysis.

Ethnicity: Only data for participants who identified as being of Pacific ethnicity (using total ethnicity approach, i.e., at least one of the chosen ethnic groups was Pacific) were included in analyses.

Physical activity*:* The main outcome parameter was '*Physical activity at least once a week'* which was the dependent variable. This was based on whether a participant reported "yes" to participating in physical activity at least once in the past week as opposed to not participating in physical activity during that week. Participants were asked "In the last seven days, how many times have you done exercise or activity that makes you sweat or breathe hard, or gets your heart rate up (such as soccer or rugby, running, swimming laps. Fast bicycling etc.)?". Response options were 1 "I don't exercise," 2 "Not in the last seven days," 3 "1-3 times," 4 "4-6 times," 5 "7 or more times,". Responses 3-5 were recoded into a binary variable as 1 (did activity one or more times in the last week) and responses 1 and 2 were recoded as 0 (no activity in last week).

Independent variables are outlined below:

Gender identity*:* Participants were asked "How do you describe yourself. Response options were 1 "I am a boy or man," 2 "I am a girl or woman," and 3 "I identify in another way,".

Long-term disability*:* Participants were asked "Do you have any long-term disability (lasting six months or more) (e.g. sensory impaired hearing, visual impairment, in a wheelchair, learning difficulties)? Response options were 1 "Yes," 2 "No," and 3 "I don't know".

Well-being index score*:* This was a summary of responses to the WHO-5 well-being index questions (higher scores represent higher well-being). Participants were asked "Over the last two weeks… I have felt cheerful and in good spirits; I have felt calm and relaxed; I have felt active and vigorous; I woke up feeling fresh and rested; My daily life has been filled with things that interest me. For each statement, response options were 1 "All of the time," 2 "Most of the time," 3 "More than half of the time," 4 "Less than half of the time," 5 "Some of the time," 6 "At no time". To generate the well-being score, the responses were reversed and put on the interval 0 to 5 (i.e. rescaled = original – 6) and then summed. Well-being scores ranged between

0 and 25 where higher scores indicated a greater well-being. Missing one or more well-being index responses were coded as missing.

Speaks ethnic language*:* Participants were asked "How well are you personally able to speak [language] in day-to-day conversation? By this we mean more than a few words or phrases". Response options were 1 "Very well," 2 "Well," 3 "Fairly well," 4 "Not very well," 5 "No more than a few words or phrases", and NA (not applicable). Responses 1, 2, and 3 were coded as 1 (speaks well) and responses 4 and 5 were recoded as 0 (speaks very little). NA was coded as missing.

Understands ethnic language*:* Participants were asked "How well are you able to understand spoken [language] now? By this we mean more than a few words or phrases." Response options were 1 "Very well," 2 "Well," 3 "Fairly well," 4 "Not very well," 5 "No more than a few words or phrases", and NA (not applicable). Responses 1, 2, and 3 were coded as 1 (fairly to very well) and responses 4 and 5 were recoded as 0 (not very well). NA was coded as missing.

Pride in ethnicity*:* Participants were asked "Are you proud of being [ethnicity]?" with [ethnicity] indicating the ethnic group participants had identified with previously. Response options were 1 (I'm not at all proud), 2 (I'm somewhat proud) and 3 (I'm very proud). Responses 1 and 2 were coded as 0 (not very proud) and responses 3 was recoded as 1 (very proud). NA was coded as missing.

Belonging to a group outside of school*:* Participants were asked "Which of the following groups, clubs or teams do you belong to? This could be at school or somewhere else. (You may choose as many as you need): Options were: (1) A sports team or group; (2) A cultural group e.g. Kapa haka; (3) A diversity group that supports sexuality and gender diverse youth, gay/straight alliance, or rainbow group; (4), Another type of group or club, e.g. music drama, gaming, or (5) None. For each option, participants could respond 1 "Yes," or 0 "No," or choose to not respond. If a participant did not provide any responses, the variable was set to NA and then recoded as missing. Otherwise, if participants responded 1 "Yes" to at least one of the options 1 to 4, the variable was set to 1. Otherwise, if participants responded "Yes," to the "None" option, or a combination of 0 "No," and no response to options 1 to 4, the variable was set to 0. Importantly, if participants responded 1 "Yes," to both "None" and another option, the variable was set to 1. That is, the response indicating group membership takes precedence.

Belong to a cultural group*:* As above, participants were asked "which of the following groups, clubs or teams do you belong to? This could be at school or somewhere else. (You may choose as many as you need)". One of the group options was: A cultural group e.g. Kapa haka. Response options to this cultural group question were 0 "No," or 1 "Yes". NA was coded as missing.

Feeling cared for by parents*:* Participants were asked "How much do you feel the following people care about you: My mum (or someone who acts as your mum); My dad or someone who acts as your dad; Other family

members". If the response to options 1 or 2 was 4 "A lot" this was coded to 1 (yes). Otherwise, if the response to either option was 1 "Not at all," 2 "A little," or 3 "Some" this was coded as 0 (no). If the response to both option 1 and 2 was 5 "Does not apply to me," this was coded to missing.

Spiritual connectedness to others*:* Participants were asked "I often feel a spiritual connection to people (e.g. friends, family, church members)". Response options were 1 "Strongly agree," 2 "Agree," 3 "Neutral," 4 "Disagree," 5 "Strongly disagree" and NA (not applicable). Responses 1 and 2 were recoded to 2 (agree), responses 3 was recoded to 1 (neutral) and responses 4 and 5 were recoded to 0 (disagree). NA was recoded as missing.

Feeling cared for at school*:* Participants were asked "Do you feel that teachers/tutors care about you?". Response options were 1 "Yes," 2 "No," 3 "Doesn't apply". Response 1 was coded to 1 (yes) and responses 2 and 3 were recoded to 0 (no).

Feeling safe in school*:* Participants were asked "Do you feel safe in your school/course?". Response options were 1 "Yes, all the time," 2 "Yes, most of the time," 3 "Sometimes," 4 "No, mostly not," and 5 "Not at all". Responses 1 and 2 were recoded as 1 (yes) and responses 3, 4 and 5 were recoded as 0 (no).

Belief that exercise is important*:* Participants were asked "Is physical activity, sport or exercise an important part of your life?". Response options were 3 "Definitely," 2 "Sort of," and 1 "Not really". Response 3 was recoded to 1 (yes) and responses 1 and 2 were recoded to 0 (no).

Feels a part of school*:* Participants were asked "Do you feel like you are part of your school, alternative education or course?". Response options were 1 "Yes," 2 "No,". Response 1 was coded to 1 (yes) and response 2 was recoded to 0 (no).

Neighbourhood safety*:* Participants were asked "Do you feel safe in your neighbourhood?". Response options were 1 "All the time," 2 "Sometimes," 3 "Not often," 4 "Never". Response 1 was coded as 1 (yes) and responses 2, 3 and 4 were recoded 0 (no). NA was coded as missing.

Importance of belief*:* Participants were asked "How important to you are your spiritual beliefs or religious faith?". Response options were 1 "Very important," 2 "Somewhat important," 3 "Not important". Response 1 was coded as 1 (yes) and responses 2 and 3 were recoded as 0 (no).

School decile*:* School decile was a variable that reflected the socio-economic status of a school's student population. Each school is assigned a decile rating from 1 to 10, with decile 1 schools having the highest proportion of students at a school based in a low socio-economic neighbourhood, and decile 10 school having the lowest proportion of such students.

Data analysis

Binary logistic regression was used to identify associations between physical activity and each independent variable. Thereafter, a multiple variable stepwise logistic regression analysis was used to identify the most significant group of predictor variables and create a parsimonious model (Kelley & Bolin, 2013). Multiple logistic regression modelling was run with all potential variables included, and the least significant variables were removed in a stepwise manner until all remaining variables were significantly associated with the dependent variable at $p < 0.05$. Model fit was assessed using multiple indicators and multicollinearity was assessed using Variance Inflation Factors (VIFs) and tolerance values for all predictors were included in the final model. Eigenvalue and Odds ratios (OR) and 95% confidence intervals (CI) were reported.

Results

Pacific youth: There were a total of 1204 participants in the Youth19 survey who identified their ethnicity as Pacific. After removal of cases with no available data for the dependent variable, a total of 1061 responses were available for data analysis. Characteristics for participants identifying as being of Pacific ethnicity and included in analyses are provided in Table 1. The small number of gender diverse participants (n = 8) led to statistical bias in modelling associations between the dependent variable and gender, so data for gender for these participants were excluded.

Results from the binary logistic regression analyses are presented in Table 1. Significant associations were found for gender, well-being index score, belonging to a cultural group, belonging to a group outside of school, spiritual connectedness to others, belief that exercise is important and school decile (students from decile 4 and 8 schools had higher odds of participating in physical activity compared with students from decile 10 schools).

After stepwise removal of non-significant factors, belief that exercise is important and belonging to a group outside of school remained significantly associated with physical activity. This final model accounted for 22.2% of the variance in the outcome ($R^2 = 0.222$; adjusted $R^2 = 0.219$). The model was statistically significant ($F(3, 625) = 59.576$, $p < 0.001$, and showed a meaningful improvement over previous models ($\Delta R^2 = 0.01$, p – 0.004). The Durbin-Watson statistic was 1.51, indicating no serious autocorrelation in the residuals. These results suggest that the model provides a reasonably good fit to the data. All VIF values were below 1.3 and all tolerance values exceeded 0.77, falling well within accepted thresholds (VIF < 5; tolerance > 0.2) and indicating that none of the predictors exhibited problematic multicollinearity.

Compared with participants who reported that exercise/physical activity was not an important part of their lives, those who reported that

exercise/physical activity was important were 4.9 times more likely to have participated in physical activity at least once in the last week (95% CI 3.27, 7.34, p <0.001). Compared with participants who reported "no" or "chose not to respond" or did not provide any response - "NA" to belonging to a group outside of school, those who reported belonging to any group outside of school were 2.1 times more likely to have participated in physical activity at least once in the last week (95% CI 1.40, 3.00, p <0.001).

Table 1. Participant characteristics and results from bivariable logistic regression modelling for participating in some physical activity in the previous week

Independent variable	**Total N**	**n**	**%**	**OR**	**95% CI**	**p-value**
Gender	1061					
Boy or man		406	38.1 %	(ref)	(ref)	(ref)
Girl or woman		653	61.2 %	0.50	(0.35, 0.69)	**<0.001**
Long term disability	1043					
Yes		68	6.5%	(ref)	(ref)	(ref)
No		919	88.1 %	1.06	(0.57, 1.95)	0.858
I don't know		56	5.4%	0.95	(0.40, 2.26)	0.909
Well-being index score	1022					
Shift with each 1-unit increase		818	80.0 %	1.06	(1.04, 1.09)	**<0.001**
Speaks ethnic language	962					
Speaks very little		579	60.2 %	(ref)	(ref)	(ref)
Speaks very well		383	39.8 %	1.01	(0.73, 1.39)	0.944
Understands ethnic language	966					
Not very well		432	44.7 %	(ref)	(ref)	(ref)
Fairly to very well		534	55.3 %	0.89	(0.65, 1.22)	0.466
Pride in ethnicity	962					
Not very proud		163	16.9 %	(ref)	(ref)	(ref)
Very proud		799	83.1 %	1.29	(0.86, 1.92)	0.218
Belong to a cultural group	947					
No		610	64.4 %	(ref)	(ref)	(ref)

Yes		337	35.6 %	1.66	(1.17, 2.37)	**0.005**
Belonging to a group outside school	947					
No		218	23.0 %	(ref)	(ref)	(ref)
Yes		729	77.0 %	3.70	(2.62, 5.22)	**<0.001**
Feeling cared for by parents	987					
No		74	7.5%	(ref)	(ref)	(ref)
Yes		913	92.5 %	1.51	(0.88, 2.58)	0.135
Spiritual connectedness	852					
Disagree		89	10.4 %	(ref)	(ref)	(ref)
Neutral		173	20.3 %	1.15	(0.79, 2.53)	0.238
Agree		590	69.2 %	1.86	(1.13, 3.08)	**0.015**
Feeling cared for at school	1053					
No		238	22.6 %	(ref)	(ref)	(ref)
Yes		815	77.4 %	0.89	(0.61, 1.28)	0.523
Feeling safe in school	1058					
No		150	14.2 %	(ref)	(ref)	(ref)
Yes		908	85.8 %	1.00	(0.65, 1.55)	0.985
Belief that exercise is important	1053					
No		454	43.1 %	(ref)	(ref)	(ref)
Yes		599	56.9 %	6.52	(4.57, 9.29)	**<0.001**
Feels a part of school	1047					
No		114	10.9 %	(ref)	(ref)	(ref)
Yes		933	89.1 %	1.02	(0.63, 1.65)	0.952
Feel safe in neighbourhood	1005					
No		479	47.7 %	(ref)	(ref)	(ref)
Yes		526	52.3 %	1.36	(0.99, 1.86)	0.055
Importance of belief/faith	946					
No		373	39.4	(ref)	(ref)	(ref)

			%			
Yes		573	60.6 %	1.22	(0.88, 1.69)	0.237
School decile	1061					
Decile 10 (highest SES)		39	3.7%	(ref)	(ref)	(ref)
Decile 9		117	11.0 %	1.50	(0.63, 3.62)	0.362
Decile 8		29	2.7%	2.08	(1.12, 3.84)	**0.020**
Decile 7		185	17.4 %	2.85	(0.83, 9.82)	0.097
Decile 6		10	0.9%	1.41	(0.87, 2.29)	0.165
Decile 5		53	5.0%	1.32	(0.27, 6.40)	0.734
Decile 4		71	6.7%	3.16	(1.19, 8.37)	**0.021**
Decile 3		201	18.9 %	1.23	(0.64, 2.36)	0.536
Decile 2		150	14.1 %	1.02	(0.65, 1.60)	0.929
Decile 1 (lowest SES)		206	19.4 %	1.37	(0.82, 2.30)	0.227

Notes: CI = confidence interval, N = number of participants, OR = odds ratio, SES = socio-economic status

Discussion

This research explored an array of potential protective factors for physical activity in Pacific adolescents that aligned with the Fonofale model. Factors significantly associated with physical activity in the bivariable analyses were gender, well-being score, spiritual connectedness to others, belief that exercise is important, belonging to a group outside school, belonging to a cultural group, and school decile (decile 4 and 8 schools). These findings align directly with the Fonofale model and highlight new insights regarding the importance of integrating spirituality and cultural values into Pacific health promotion initiatives (Neville et al., 2024; Savila et al., 2022).

After accounting for all other elements in the multivariable analyses, belief that exercise is important and belonging to a group outside of school remained significantly associated with participating in at least some physical activity in the previous week. The impact of these factors on activity was considerable - participants who reported that exercise/physical was an important part of their lives were nearly 5 times more likely to have participated in activity in the previous week. Those who belonged to a group had double the likelihood of participating in activity in the previous week, highlighting the important role extra-curricular groups can have in

promoting physical activity.

As well as linking with the Fonofale model, these findings also are in line with the TPB, where positive attitudes towards physical activity impact the likelihood of participation (Ajzen, 1991). Although we cannot determine if belonging to a group outside school directly involved physical activity, it is possible that this finding also aligns with the concept of relatedness in SDT (Fortier et al., 2012). According to SDT, feeling a sense of belonging and connectiveness motivates participation in physical activity; and with the foundation/'aiga component of the Fonofale model which highlights the importance of collectivism, social connectedness, and belonging (Savila et al., 2022).

Findings are also aligned with previous research with adolescents. While there is a paucity of literature specifically regarding Pacific adolescents, an intervention including Pacific youth living in Australia has shown significant increases in participants' knowledge of recommended levels of physical activity for health, and the importance of physical activity for preventing heart disease and improving self-esteem (Mihrshahi et al., 2017), showing the potential for such approaches. A Moroccan study using focus groups with 56 adolescents showed those who reported positive beliefs regarding the importance of physical activity were more likely to exercise (Abdelghaffar et al., 2019). A quantitative examination with 1131 Icelandic adolescents showed that sociability and perceived importance of sport and of health improvement were amongst the factors significantly related to activity participation (Vilhjalmsson & Thorlindsson, 1998). Voorhees et al. (2005) found that group involvement and sports participation positively correlated with increased physical activity participation levels for female adolescents. In their study, adolescents' involvement in activity-promoting groups had encouraged collaborative efforts to achieve specific goals and targets, leading to various health benefits. Another international study by Silva et al. (2010) identified a critical association between engaging in extracurricular sports outside of school and an increased likelihood of meeting recommended national physical activity guidelines in Portuguese adolescent participants. Despite the differences in comparing participant ethnicity, these global findings support the results of the current study. Belonging to a group outside of school aligns with the Fonofale framework in culture and environment, which shelters the individual's focus to maintain cultural values of connectedness, socialisation, and collectiveness (Ponton, 2018).

The results from this study indicated that Pacific adolescents who reported joining a group outside of school, such as a sports team or cultural group, allowed them to build positive connections by engaging in active behaviour. An essential consideration for supporting participation in groups outside of school should focus on addressing perceived barriers that Pacific adolescents experience. Past findings by Abdelghaffar et al. (2019) showed that several participants mentioned a lack of community sports facilities, which they viewed as a hindrance to engaging in physical activity. Perceived barriers that were reported contained inadequate spaces that facilitated physical activity

and a lack of safety support for young participants.

Strengths, limitations, and implications for research and practice

Key strengths of this research include the use of the Youth19 dataset, a large, culturally diverse sample, and the application of a strengths-based approach drawing on the Fonofale model for identifying variables. Adopting a Pacific health model in research with Pacific communities aligns with culturally relevant collective approaches that prioritise the well-being of Pacific people and foster their protective factors.

A key limitation was the use of a single, self-reported item to measure physical activity. Although self-reports are cost-effective and easy to administer, they are prone to bias (Sallis & Saelens, 2000). It is essential to consider robust strategies for future research and improve measures of physical activity to enhance the quality of quantitative analysis in this area. Future research may consider adopting objective measures (e.g., pedometer, accelerometer) and encourage self-reported surveillance measures further exploring the types of activity (e.g., active transport) and domain-specific measures to provide reliable and detailed data on physical activity in participants (Kelly et al., 2016).

Increasing awareness of the benefits of physical activity alongside increasing visibility of activity opportunities within communities is important. Government policies that facilitate physical activity levels beyond school-based physical activity, specifically focusing on community-based interventions, may benefit Pacific people (Utter et al., 2006). Successful physical activity interventions for Pacific youth and adolescents have been studied using community-based approaches (Fotu et al., 2011; Tupai-Firestone et al., 2018; Utter et al., 2006). Utter et al. (2010) proposed implementing the positive youth development framework to promote a strengths-based approach to support and develop young people's skills and capabilities for positive life changes associated with physical activity. Community-based participatory research is also appropriate and vital to serve research advantages for Pacific individuals as it can build trust between researchers and communities, and honour the unique contributions such as cultural knowledge and expertise of communities at all stages of an intervention (Panapasa et al., 2012).

Collaboratively achieving physical and mental health benefits within the Pacific community is crucial. This includes developing programs applicable through church-based events, local community events, and family and peer groups (Panapasa et al., 2012). Promoting and expanding outside-of-school programmes and competitions such as social sports games or recreational activities incorporating physical activity and fostering a sense of belonging and social connectedness is advisable to promote these strengths. Constructing physical activity environments is crucial to support positive psychosocial experiences for Pacific youth and adolescents.

Exploring the perceived beliefs and attitudes of Pacific adolescents towards

physical activity and their protective factors is another important area for further research. Using qualitative measures can help discover individual opinions and self-reported experiences that positively influence the participation of Pacific individuals in physical activity (Savila et al., 2022). This insight can guide researchers to develop relevant interventions that enhance the protective factors of Pacific adolescents. This perspective links to the concept of Pacific worldview as holistic, emphasising the interconnections between people, nature, and living and non-living elements. Moreover, recognising and respecting Pacific knowledge as a valid source of insight is vital, as highlighted by Ponton (2018). This involves integrating Pacific methodologies into research to enhance outcomes for their communities and adopting a Pacific-centred approach. Accepting and integrating these cultural nuances, as outlined by Vaioleti (2006), is fundamental for researchers collaborating with Pacific community groups to ensure that their approaches are culturally appropriate and resonate effectively within these communities (Nanai et al., 2017).

Conclusion

This research identified two key protective factors for physical activity in Pacific adolescents in New Zealand: the belief that exercise is important and belonging to a group outside of school. These factors may positively affect Pacific youth participation in school physical activities and within their local communities. More in-depth qualitative analysis can provide additional insight into these protective factors as expressed by participants. Implementing community-based interventions should emphasise the benefits of physical activity and embrace a strengths-based approach. Physical activity offers numerous benefits, including improved physical and mental health. Additionally, it fosters social cohesion and strengthens community connections among Pacific people. Future studies are encouraged to prioritise strengths-based approaches that support protective factors and are culturally relevant for Pacific youth in physical activity interventions, thereby improving their overall well-being.

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