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Genetics and Epigenetics from Physical Activity: Ghana Active Schools' Programme and Ambidextrous Organisational Practices

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Authors' contributions

This work was carried out in collaboration between all authors. Author JA designed the study, wrote the protocol, and wrote the first draft of the manuscript. Authors FAK, WHS and SM managed the literature review, infographics and editing. All authors read and approved the final manuscript.

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ABSTRACT

Aim: In this paper, we examine how ambidextrous organisational practices can be used to advance the management of public basic schools in accepting behaviours that can improve physical activities of children.
Methodology: Drawing on extant literature and desk review of policy documents including school reports, we examine physical activities in public basic schools in Ghana and then explore three key developmental systems – managerial responsiveness, healthcare variation and educational

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development and highlight four areas from these systems; organisational processes, infrastructure development, human resource improvements, and stakeholder collaboration where policy makers can focus their efforts to improving physical activity in school children in Ghana.

Findings: The findings demonstrate a seeming absence of structures for physical activity in public basic schools in Ghana - presenting severe consequences, especially for the healthy growth of children, proper integration of children into society, learning processes, and developing talents for future sporting activities in general. Again, the analysis shows that the Ghana Education Service's implementation guidelines for physical activity in public basic schools are not yielding the needed results - thus provoking policy dialogues in managerial practices for effective implementation of those guidelines. Next, we propose the promotion of physical activity in public basic schools in Ghana through sustainable and pragmatic approaches drawing from ambidextrous managerial practices to strengthen organisational capacity in the schools for improvements in movement behaviours, lifestyle changes, active learning, and physical activity levels of school children.

Conclusion: Practical approaches are needed to enhance the physical activity for children and this requires the initiation of active schools' programme in public basic schools – and clearly learning from best practices in the last decades, examples from other countries provide a really useful approach in the years ahead.

Keywords: Physical health; public basic school; managerial practices.

1. INTRODUCTION

Movement behaviours in the 24-hour period among children and youth have set down exponential interest in public health research and practice especially in the discipline of sports medicine [1]. This is because the recommended benchmark to participate in moderate-to-vigorous physical activity (MVPA) of 60 minutes daily across the globe, has not been achieved [2]. Quite a substantial percentage of the global population remains inactive below the recommended levels of physical activity [3].

Given this, for example, Canada has released evidence-informed 24-hour movement guidelines for children and youth in reaction to the adverse trends in physical activity [1]. The Australian Government also in 2008, developed the first national guidelines for physical activity and sedentary behaviours for early years [4]. Again, the United Kingdom in 2010 reviewed and updated its existing guidelines on physical activity for children to respond to emerging scientific evidence on sports medicine [2]. All across Europe, the verge of attaining the 60-minute MVPA among school children has increased between 70% and 76% [2].

The underlying importance of physical activity especially in children cannot be overemphasised in neurodevelopmental studies and the desire to explore measures to control non-communicable or chronic diseases is unequivocally expressed in many policy dialogues in both developed and developing countries. We explore both perspectives and consider three key developmental systems – managerial responsiveness, healthcare variation, and educational development in our discussions. We then highlight four areas from those systems; organisational processes, infrastructure development, human resource improvements, and stakeholder collaboration where policy makers can focus their efforts on improving physical activity in children.

To discover the connection among these systems we review literature on genetics and epigenetics and draw on experiences from selected countries - induced with a case from Ghana. We further draw insights into the application of management practices from the scientific management literature. We then suggest a more practical approach to the implementation of physical activity in public basic schools in Ghana as a way for other low-middle-income countries (LMICs) experiencing similar challenges.

1.1 Genetics and Physical Activity

Indeed, lifestyles such as smoking and alcohol abuse, unhealthy diet, and inactivity can lead to chronic diseases or ill health [5,6,7]. When these health risk behaviors lead to chronic disease, they lengthen dysfunctional habits in eating, drinking, breathing, and moving - leading to unmaintainable ease of functioning of the individual and other genetic consequences [5]. For example, individuals who are prone to the above lifestyles not only put themselves at risk of

certain chronic diseases such as diabetes and hypertension but can put their future offspring at risk. Physical inactivity and sedentariness contribute considerably to ill health and premature mortality [5,8].

Disparities in physical activity and sedentary behaviour have been attributed to genetic factors and in a reverse form as well. For example, the literature has identified a complicated set of environmental, genetic, and phenotypic causes that connect physical activity and sedentariness to other behavioural qualities [9,10,11]. Again, a systematic review of 45 articles from physical activity and genetics literature revealed genome-wide significance showing an association between genetics and physical activity [12]. Other studies have also reported the association between physical activity and genetics [13,14,15]. At the sharp edge of this phenomenon, creates a real need for principles of health that can integrate existing naturalistic and holistic perspectives of population health including physical activity.

1.2 Epigenetics from a Physical Science Perspective

Recent systematic reviews on physical activity among children and its relationship to health suggest a positive benefit associated with desirable movement behaviours [1]. For example, literature on sports medicine shows that 62%-84% of Canadian school children and toddlers of age (1-2 years) all meet physical activity guidelines [1]. This is in line with other scholars' propositions that suggest effective physical activity as an important requirement during childhood school years [2]. Daly-Smith [2] indicates that there is a need for a whole-school approach to physical activity since meta-analysis of current approaches to physical activity has had little, if any, effect on MVPA.

While some countries continue to make significant strides in meeting the standard benchmarks for physical activity among children, little is being done in other countries especially the LMICs. The implementation of guidelines on physical activity in basic schools in some LMICs has either met management or policy resistance. In other jurisdictions such as the Philippines, there is a report card for physical activity guiding children and adolescents to have a robust evaluation of physical activity and other close behaviours such as variables and settings that are likely to influence these behaviours [16]. Despite this, it has been shown that children and adolescents in the Philippines also do not meet the recommended provision of physical activity [16].

Furthermore, physical activity in the same jurisdiction indicates that there is an overwhelming concern for insufficient physical activity among Filipino children [17]. In all those cases, ineffective managerial and organisational practices as well as inadequate multi-stakeholder involvement have been identified as key bottlenecks [17]. In line with these developments in the Philippines, there is a need for a comprehensive plan that will ensure effective managerial practices on physical activity in schools for Filipino children and adolescents [18].

In Hong Kong, for instance, the Department of Health through the Centre for Health Protection has revealed a similar situation as in the Philippines. An analysis of the 2020-2022 population health survey in Hong Kong indicated that 24.8% of the population within the age brackets of 18 and above had insufficient physical activity with females taking a lead of 26.5% while their counterpart males represent 22.8% [19], suggesting systemic weaknesses in the implementation of physical activity programs in some Asian countries.

It cannot therefore be taken for granted that the net effect of insufficient physical activity has a huge consequence on the individual's health and in children, the significant developmental and growth challenges are very alarming as underscored by many scholars and researchers [2,17,18]. Low physical activity levels can lead to negative health outcomes. For example, the World Health Organization has shown that in 2014 alone, over 6 million people globally were obese as a result of low physical activity [17]. Besides, obesity prevention could be related to school-based physical activity interventions [17]. This suggests that obesity can be minimized and or prevented if appropriate interventions are implemented effectively, especially at the basic school level where children undergo major developmental changes both mentally and physically. Yet, structural defects and managerial weaknesses in most cases hinder the successful implementation of what otherwise could be described as modest and innovative interventions.

More difficulties in school management practices regarding physical activity arise when diminished

integration of physical activity into basic school curriculum increases overweight and obesity in elementary school children as well as low academic achievement in elementary school children [20]. Certainly, these gaps motivate the need to co-produce interventions in a way that would combine both bottom-up and top-down approaches to create 'system change' at the global level [20].

Notwithstanding calls, for the development of an effective whole-school approach in sustaining change and behaviour movement, it is unclear what the most effective approaches are [16]. This may result from structural deficiencies, infrastructure gaps, lack of holistic framing, poor managerial and organisational practices, inadequate multi-stakeholder involvement, and sustainability measures during the implementation of physical activity programmes in schools [16].

However, in LMICs such as Ghana, this new integrated approach has not yet been applied within the school setting partly due to the inability of managers in most of the schools to combine the complex issues in health - often described as 'wicked problems'; children's education, management and culture and to create synergies for optimum outcome. It is on this premise that, the authors propose the implementation of the Active Schools' Programme (ASP) that embraces ambidextrous managerial and organisational practices in public basic schools in Ghana - suggesting an integrated approach from three key perspectives of social developmental approaches and growth in children (management, healthcare, and education).

While the aspects of healthcare and education on the growth and development of children have been extensively discussed the literature is silent on the integration of the three – leading to a seemingly gap that results from management lapses in the implementation of what we can describe as *'beautiful'* guidelines on physical activity but non-functional in many schools in some LMICs.

1.3 The Ghana Case

Promoting physical activity in public basic schools in Ghana has a basis from the national policy dimension with a framework to guide the implementation. This is expected to achieve five main objectives; health improvements, facilitating learning, ensuring social integration, preventing neurodevelopmental disorders, and preparing talents for future sporting events; but we argue in Ghana, the implementation of physical activity programmes has been flawed with many challenges such as structural defects, infrastructure gaps and lack of holistic framing. Most of the public basic schools do not have the appropriate organisational structures to operationalise policies on physical activity. Some of the schools do not have the relevant infrastructure to facilitate physical activities and the few that operate physical activities see them as vertical programmes with no proper and effective coordination with other programmes in the schools [4].

The national policy framework in Ghana requires the implementation of active physical activity in basic schools but the apparent absence of structures for physical activity in public basic schools presents severe consequences, especially for the healthy growth of children, proper integration of children into society, learning process and developing talents for future sporting activities in general.

In recent years, there have been calls in Ghana to develop a whole-school approach to physical health and/ or framework on physical activity that will foster movement perspective and healthy lifestyle behaviours among school children [4]. To restore the decline in physical activity among school children in Ghana, new approaches that are practically appropriate, innovative, and contextually feasible for children are required in public basic schools. For example, the 2018 Ghana report card on physical activity for children and youth indicated that the Ghana Education Service recommends at least 80 minutes per week of physical activity in schools, but this is not the practice case. The report card further indicated that the failure of children and youth to achieve the required recommendation poses a threat to their health and active learning [19]. These threats affect the overall physical health (sleep, nutrition, movement behaviours, and activity levels of the school children) and academic performance [19].

The report shows that the proportion of Ghanaian children who achieve the World Health Organization (WHO) required physical activity amount is low. It further concludes that the mandate of the Ghana Education Service (GES) on physical activity for school children that will be applicable, can be easily enforced, and supervised and ensure total compliance. The

report therefore recommends a strategic approach to physical activity programmes which is necessary to promote a healthy and better life for children. Interestingly, the Ministry of Education has developed a physical education curriculum for primary schools [20], and needs to be implemented by the Ghana Education Service through rigorous stakeholder interventions to reinvigorate active participation in physical activity among school children.

Recently, the call for (re) building of the nation's soccer/football team, which is a major sport in Ghana, as a result of the abysmal performance at the 2021 African Cup of Nations in Cameroon and the 2022 FIFA World Cup in Qatar, reiterates the need to start building talents for future sports events and that can only begin from basic schools – practical approaches to physical activity is indeed critical and best practices from elsewhere can be taken on board. Fortunately, history in this area also offers examples to learn from.

Physical activity is not a new concept in public basic schools in Ghana, but the neglect and low visibility it is receiving in recent times, demand a new paradigm that highlights distinctions in culture, policy and practice, strategy and management. We find this in active schools' programme concept being implemented in other countries and propose ambidextrous organisational principles to be adopted by public basic schools in the implementation of the ASP to address the current management lapses.

1.4 Ambidextrous Managerial Practices

Ambidextrous as a concept attained widespread recognition in management circles when O'Reilly and Tushman published an article on ambidextrous practices in Harvard Business Review in 2004. The concept traces its features to the ancient Roman god Janus - with two sets of eyes where one pair concentrates on past events while the other set focuses on future events [9]. It signifies managerial practices where managers can always look back and bring to bear the old best practices that have been neglected whereas distinct attention is focused on the future.

A culturally sensitive approach in the context of Ghana that relates to this concept - what in our view could be termed as a management principle is the 'Sankofa' slogan. 'Sankofa' is an Akan idiom that translates; 'go back for the past good practices or concepts.' This principle is often applied by traditional leaders in their quest for solutions to complex problems. The philosophy underpinning 'Sankofa' makes the adoption of useful past concepts and practices significant within the traditional Ghanaian context and not taboo.

Interestingly, looking at the integrated approach to this paper, it is imperative to consider in practical terms a more appropriate way that brings together good old practices and new technology based on broad-minded principles which are vital in addressing existing challenges and fostering opportunities for both long - term and short - term orientations. In this case, managers of public basic schools can look back to the old physical activity concept in elementary schools that used to produce athletes and sportsmen for national sports programmes, but now dysfunctional, while at the same time staring ahead in preparations for future innovations to improve existing practices. Ambidextrous practices have proven to be effective in similar cases in improving performance, facilitating organisational change processes, and encouraging innovations leading to strategic flexibility and operational efficiency [20,1,2,4,19].

We suggest therefore, a constructive approach for managers of public basic schools in Ghana to adopt, and draw from ambidextrous organisational practices and integrating management principles that reflect lessons from the past into the existing active school's programme to ensure efficiency in the management of the programme.

1.5 The Very Useful Way Ahead

From the perspectives articulated in the previous sections, there are many useful ways to advance physical activity in public basic schools. Firstly, it needs to be conceded that the Ministry of Education and Ghana Education Service have already initiated measures for active schools' programme. However, there remain contradictions in the implementation of this policy partly due to weaknesses in managerial practices. In that regard, we recommend a rather useful approach using the 'Sankofa' slogan – which in our opinion symbolises an ambidextrous management concept.

Next, we explain in practical terms the active schools programme to mean; a holistic approach to physical activity that encompasses managerial creativity and innovations as well as operational effectiveness. This brings to the fore improvements in; managerial practices and structures, human resources, stakeholder

engagement, and sporting infrastructure similar to existing practices in the United Kingdom, Canada, Australia, the USA, and some areas in Asia.

We propose the establishment of a unit for physical activity in public basic schools. This unit will coordinate all the activities of the active schools' programme, with support and budget allocation from the government and internally generated funds. This unit will work in close collaboration with physical education teachers in designing more suitable steps and interesting physical activity patterns for school children. This may include outdoor adventure education, arts, games, site-seeing, etc. to complement the school curriculum. The unit may also seek support from corporate bodies locally and internationally to foster its operations. The unit can serve as a ground to nurture, develop, and enhance the skills of sports medicine teams; sports medicine, sport psychology, sport management, sport nutrition, and fitness professionals in the overall identification of talents to feed into the national sports basket.

The setting up of this unit requires training and mentoring of personnel as physical education experts, regenerative health experts, counselling psychology experts, and sport and exercise science experts who will form the core of the needed capacity to implement the active schools' programme. Closely related is the establishment of recreational or wellbeing facilities. These centres should have basic equipment such as abdominal crunch, hip adductor/abductor, rotary hip, leg extension, triceps press, and woodway treadmill. Activities in these centres should be supervised by the exercise scientist, regenerative health personnel, and physical education experts, who through their engagements with the school children may be able to identify challenges, gaps in sporting skills, and or recreational habits. This engagement would be ideal to segregate school children into professional development and recreational paths. The facility will further serve as a hub for research and development into physical activity and its impact in Ghana with findings well suited in context to position the nation towards the WHO 2030 active society agenda.

The creation of sporting infrastructure within the spheres of the basic schools will encourage and motivate pupils to participate in physical activities. Sporting Infrastructure such as a volleyball court, table tennis, field hockey pitch, basketball court, mini football pitch, martial arts, taekwondo, trampoline, etc., will complement the implementation of the active schools' programme. Further, the recent development of youth sports centres in the various regions of Ghana may also increase the promotion of physical activity in public basic schools to aid in talent identification thereby minimising epigenetic factors.

The proposed framework is represented in Fig. 1.

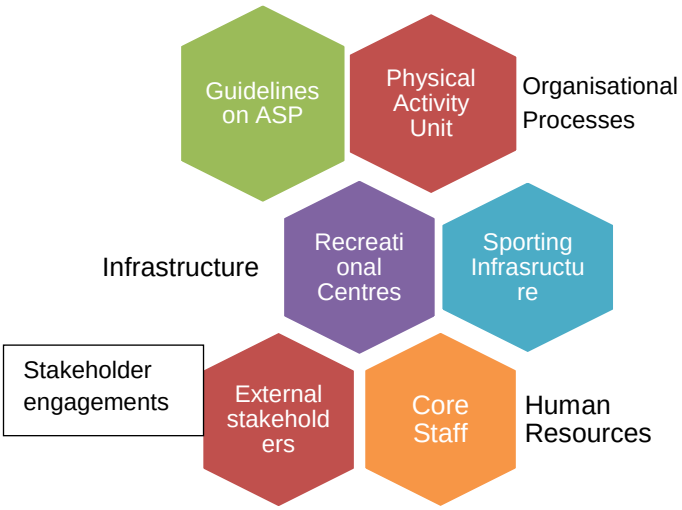

Fig. 1. Active Schools' programme framework. This programme proposes a minimum of four (4) hours of physical activity, twice a week within the academic calendar. It is expected that, when this programme is implemented, it will influence human capital development, good physical health; adequate sleep, dietary improvements, appropriate movement behaviours, and positive attitudinal behaviours among school children

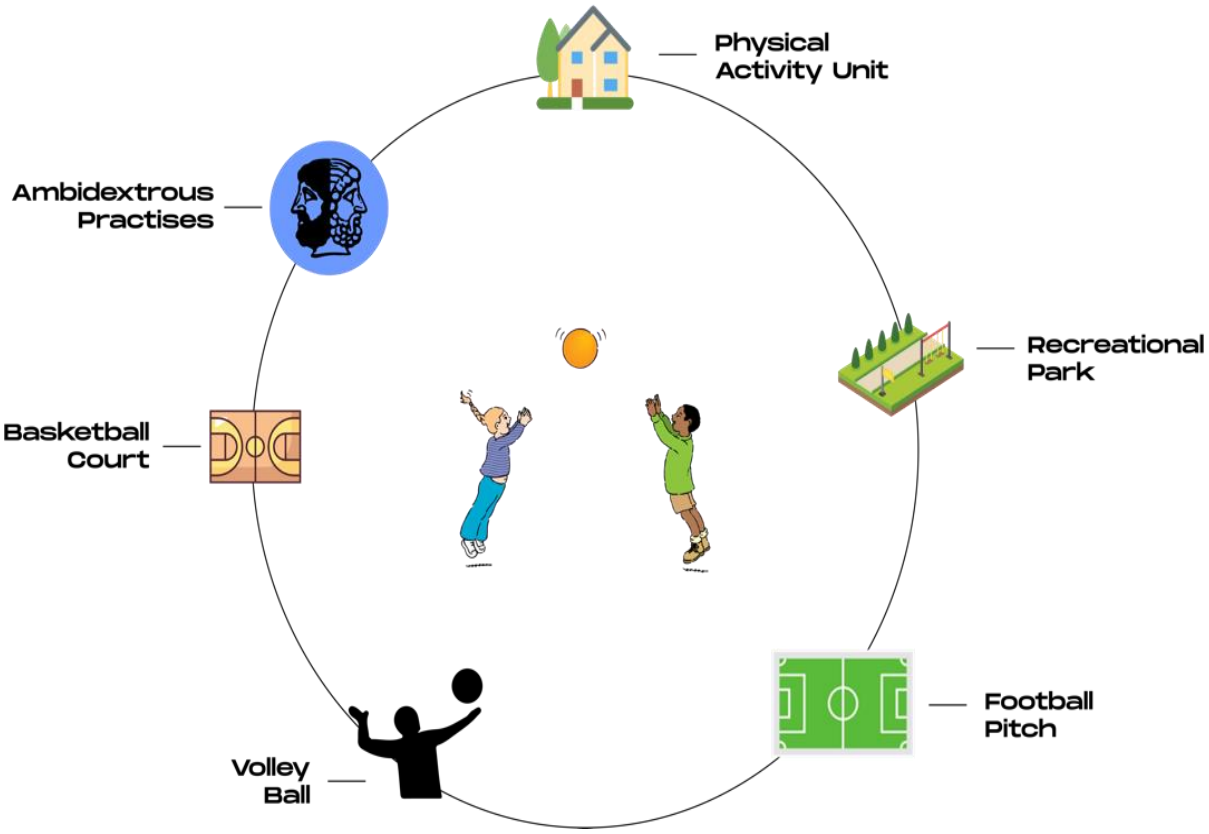

Fig. 2. Active Schools' Framework

2. CONCLUSION

In this paper, we have shown how ambidextrous organizational practices can be used to advance the course in management practices for accepting behaviours that can improve the physical activities of children in basic public schools. Promoting physical activity in public basic schools in Ghana is expected to achieve five main objectives; health improvements, facilitating learning, ensuring social integration, prevent neurodevelopmental disorders, and preparing talents for future sporting events; but the implementation of physical activity has inconsistencies arising from structural defects, infrastructure gap and lack of wholistic framing.

In countries where physical activity in public basic schools has received higher recognition and visibility by policy makers and practitioners, there have been improvements in movement behaviours, lifestyle changes, active learning, and increased physical activity levels of school children. The seeming absence of structures for physical activity in public basic schools presents severe consequences, especially for the healthy growth of children, proper integration of children into society, learning process, and development of talents for future sporting activities in general - thus provoking policy and practice dialogues in epigenetics. Undeniably, learning from best practices in other countries, and drawing from ambidextrous managerial practices these challenges could be mitigated in the years ahead. Practical approaches are needed to enhance the physical activity of children and this requires the implementation of active schools programme in public basic schools.

Considering the health of children and talent acquisition in sports which both are areas of concern for Ghana, this paper proposes a strategic framework for active schools' programme focusing on practical approaches to physical activity that aims at promoting healthy lifestyle practices in school children, creating a continuous learning environment in schools and preparing talents for future sporting events in the country.

Reflecting on the limited capacity of public basic schools to promote physical activity and physical education among the school children we recommend the need to revert to the traditional

health and active learning policies in basic schools. This paper proposes an Active Schools' Programme for implementation in the public basic schools. Thus, the attention of policy makers most especially the Ministry of Health, Ministry of Youth and Sports Ghana Education Service, Parent Teacher Associations, and Ghana National Association of Graduate Teachers need to (re) enforce physical education and physical activity programmes in the basic schools of the public institutions. Childhood obesity onset is on the rise and Ghana is not an exception, thus the need for ambidextrous practices to improve school management taken into consideration children's health, level of physical activity, active learning, and the overall human capital development of children.

A continual neglect of physical activity and physical education programmes at the public basic schools may lead to difficulty in talent identification, growth, and development, which in the long run, can create barriers in the nation's effort to scout for talents into sporting events in the country. Hence, the proposition for an active school programme in the public basic schools would be useful for such new talents in the nation's sports and social integration. As much as we share this opinion as a way of improving physical activity in public basic schools, we are also of the view that an empirical study is needed to provide legitimacy to the proposals in this commentary.

COMPETING INTERESTS

The authors have declared that no competing interests exist.

REFERENCES

1. Adab P, et al. Effectiveness of a childhood obesity prevention programme delivered through schools, targeting 6 -7year-olds: cluster randomised controlled trial (WAVES study. BMJ. 2018;2018:360: k211.
   Available:https://doi.org/10.1136/bmj.k211 practise
2. Daly-Smith A, Hobbs M, Morris JL, Defeyter MA, Resaland GK, McKenna J. Moderate-to-vigorous physical activity in primary school children: Inactive lessons are dominated by maths and english. Int. J. Environ. Res; 2021.
   Available:https://doi.org/10.3390/ijerph 18030990
3. Troiano RP, Berrigan D, Dodd KW, Masse LC, Tilert T, McDowell M. Physical activity in the United States measured by accelerometer. Med Sci Sports Exerc. 2008;40(1):181–8.
4. Daly-Smith A, Quarmby T, Archbold V, S J. Using a multi-stakeholder experience-based design process to co-develop the Creating Active Schools Framework. Int J Behav Nutr Phys Act. 2020;17:13.
   Available:https://doi.org/10.1186/s12966-020-0917-z
5. Kohl HW 3rd, Craig CL, Lambert EV, Inoue S, Alkandari JR, Leetongin G, et al. The pandemic of physical inactivity: global action for public health. Lancet. 2012;380(9838):294–305.
6. WHO. Political declaration of the high-level meeting of the general assembly on the prevention and control of non-communicable diseases resolution 66/2; 2012.
7. Strain T, Brage S, Sharp SJ, Richards J, Tainio M, Ding D, et al. Use of the prevented fraction for the population to determine deaths averted by the existing prevalence of physical activity: a descriptive study. Lancet Glob Health. 2020;8(7):e920–e30.
8. Lee IM, Shiroma EJ, Lobelo F, Puska P, Blair SN, Katzmarzyk PT. Effect of physical inactivity on major non-communicable diseases worldwide: an analysis of burden of disease and life expectancy. Lancet. 2012;380(9838):219–29.
9. Eskola PJ, Lemmela S, Kjaer P, Solovieva S, Mannikko M, Tommerup N, et al. Genetic association studies in lumbar disc degeneration: a systematic review. PLoS One. 2012; 7(11): e49995.
10. Thomas D. Gene--environment-wide association studies: emerging approaches. Nat Rev Genet. 2010;11(4):259–72.
11. Bookman EB, McAllister K, Gillanders E, Wanke K, Balshaw D, Rutter J, et al. Gene-environment interplay in common complex diseases: forging an integrative model—recommendations from an NIH workshop. Genet Epidemiol. 2011;35(4): 217–25.
12. Aasdahl L, Nilsen TI, Meisingset I, Nordstoga AL, Evensen KA, Paulsen J, Mork PJ, Skarpsno ES. Genetic variants related to physical activity or sedentary behaviour: a systematic review.

International Journal of Behavioral Nutrition and Physical Activity. 2021 Dec18(1):1-8.

13. Okely AD, Ghersi D, Hesketh KD. A collaborative approach to adopting/adapting guidelines - The Australian 24-hour movement guidelines for the early years (Birth to 5 years): an integration of physical activity, sedentary behaviour, and sleep. BMC Public Health. 2017;17:869.
Available:https://doi.org/10.1186/s12889-017-4867-6

14. Tremblay MS, Chaput JP, Adamo KB. Canadian 24-hour movement guidelines for the early years (0–4 years): An integration of physical activity, sedentary behaviour, and sleep. BMC Public Health. 2017;17:874.
Available:https://doi.org/10.1186/s12889-017-4859-6

15. Joseph ED, Jerry LG, Cheryl AG, Bryan KS, Richard AW, Debra KS, Katrina D, Matthew SM, Kristin HS, Joseph JR, Dennis JJ, Shannon LW. Physical activity across the curriculum (PAAC): a randomized controlled trial to promote physical activity and diminish overweight and obesity in elementary school children, Preventive Medicine. 2009;49(4):336-341.

16. Vida KN, Luguterah A, Sofo S, Aryeetey R, Badasu M, Nartey J, Assasie E, Donkor SK, Dougblor V, Williams H, Ocansey R. Results from Ghana's 2018 report card on physical activity for children and youth. Journal of Physical Activity and Health; 2018.
Available:https://journals.humankinetics.com/view/journals/jpah/15/s2/article-pS366.xml

17. Cagas JY, Mallari MFT, Torre BA, Kang MDP, Palad YY, Guisihan RM, Aurellado MI, Sanchez-Pituk C, Realin JGP, Sabado MLC, Ulanday MED, Baltasar JF, Maghanoy MLA, Ramos RAA, Santos RAB, Capio CM. Results from the Philippines' 2022 report card on physical activity for children and adolescents. Journal of Exercise Sci Fi. 2022;20(4):382-390.
DOI: 10.1016/j.jesf.2022.10.001

18. Bulletin M. Get the Young Moving – A call to solve the problem of insufficient physical activity; 2022.
Available:https://mb.com.ph/2022/11/27/get-the-young-moving-a-call-to-solve-the-problem-of-insufficient-physical-activity

19. Palad YY, Guisihan RM, Aguila MER, Ramos RAA, Cagas JY. An evaluation of policies promoting physical activity among Filipino youth. Int. J. Environ. Res. Public Health. 2023;20: 2865.
Available:https://doi.org/10.3390/ijerph20042865

20. Centre for Health Protection. Physical Activity;2023.
Available:https://www.chp.gov.hk/en/healthtopics/content/25/8804.html#:~:text=Situation%20in%205%20for%20male

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