



Analysis Of Active School Commuting Infrastructure In Ota, Ogun State, Nigeria

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Abstract

Active commuting can be enhanced through infrastructure development to promote well-being. Lack of awareness and little or no knowledge of the importance and health benefits reduces the rate at which school children and policymakers value active commuting in Nigeria. The study analysed the activities of active school commuting with cycling in Ota, to provide information on how it would enhance the well-being of young people. Primary (questionnaire) and secondary data were used. A multistage sampling method was adopted. Twenty public schools were identified, and 50% were randomly selected. Random sampling was used to select 20 students up to age from each school selected for the survey, therefore having a total of 200 questionnaires. The data were analysed using descriptive statistics and five-point Likert-scales method. The findings revealed that the road was not constructed to standard, was not in good condition, and lacked some necessary amenities. Active commuting users were not satisfied with the existing conditions of the road. Well-being indicators revealed that derived active factors have the highest mean score of 4.07, and respected active factors have the lowest mean score of 2.74. Active school commuting is a subset of physical activity which promotes wellness and quality of life. It is recommended that the government should rehabilitate the road up to standard and provide necessary amenities for the safety of active commuting users. Local governments also can organize active commuting sports competitions for school children and young ones in their jurisdiction.

Keyword: Active commuting, well-being, physical activity, road

Introduction

Physical inactivity in children and youth continues to be an international epidemic and a potential contributor to chronic disease in adulthood (Wadsworth *et al*, 2012). Active commuting comprises several different active transport modes such as velomobiles, rollerblades, jogging, and running, but the most common modes are walking and cycling (Wadsworth *et al*, 2012). Hereafter, the term active commuting refers to these two modes. Moreover, many forms of commuting also include an active mode for one part of the journey, but a car or public transport for the remaining part. Walking and cycling to school represent opportunities for children to achieve regular physical activity (Weuve, 2004). These behaviours may be influenced by characteristics of the environment around homes and schools, however few studies have quantified the potential associations between these two sets of factors.

Active commuting (walking and cycling) to school is associated with higher levels of physical activity among children (Rodríguez-López *et al*, 2013) and it is a method by which youth can build physical activity into their daily routines (Babey *et al*, 2009). Active commuting to school provides opportunities to increase cardio-respiratory fitness (Chillón *et al*, 2010), prevent obesity (Mendoza *et al*, 2011), and decrease metabolic disease

(Pizzaro *et al*, 2013). The recent decline in children's active commuting to school (Pizzaro *et al*, 2013; Lee *et al*, 2008) has become an important public health issue because positive associations have been observed between active commuting and overall physical activity levels (Lee *et al*, 2008). Given the important role of physical activity in overall health promotion, and the decline in physical activity among children and adolescents (Lee *et al*, 2008), it is crucial for each society to review all the opportunities available to promote increased physical activity among youth to enhance their well-being. Before now, issues relating to the commuting of Nigerian secondary school students to and from school, from the perspective of physical activity and health were barely known.

Active commuting is a widespread behaviour in our society. Numerous students in Ota and elsewhere have been observed walking and cycling to school on weekdays. The active commuters, who can be assumed to be a large group, get several beneficial outcomes from their active commuting. This study focuses on only active commuting with only cycling to schools. Cycling might not require a definition, but it can be separated from the use of other human-powered vehicles with more than two wheels and also from electrically assisted bicycles (Rosen, Cox, and Horton, 2007). Walking and cycling have been studied from different perspectives and in several research contexts and have been labelled according to purpose as leisure, sport, transport, and physical activity. There is a need to analyse the level by which pupils in the study area appreciate the use of active commuting, the level of their satisfaction, and the benefits derived from using it to encourage other students to use it for easy movement of commuters from home to school. The better the quality of paths and aesthetics in the neighbourhood, the better the perceived quality of safety and the pedestrian realm. Meanwhile, this study analysed the activities of active school commuting, especially those with

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cycling in Ota, to provide information on how it enhanced the well-being of young ones and improved the transportation system in the study area.

2. The study Area

The study area Ota, which is currently the headquarters of Ado-Odo/Ota Local Government has been prominent in the administrative, cultural and economic development of its region for a long time. Ota is located on latitude 6° 42' North and longitude 6° 13' East covering a land area of 1,263 square kilometres (Figure 1.). It has a terrain of 1,010.4 square kilometres of plain land and about 252.6 square kilometres of bad terrain comprising 16% riverine and 4% hilly regions. Ota is situated near the boundary with Lagos State and has steadily grown to be the largest industrial town in Ogun State, largely as a result of its proximity to Lagos. Figure 2 shows the map of Ota and its environs.



Fig 1. Ado-Odo/Ota Local Government Area within Ogun State Context.

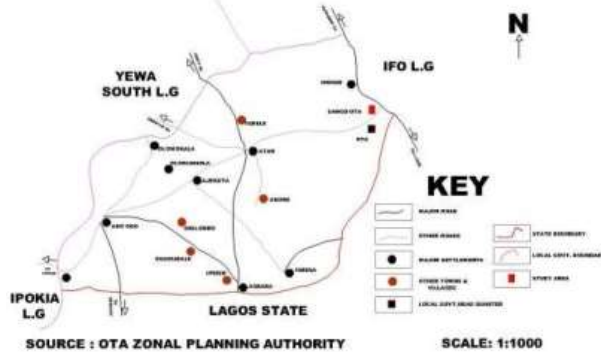


Fig 2. Map of Ado-Odo/Ota Local Government and its major Areas.

Source: Ministry of Urban Development and Physical Planning, Ogun State, 2023.

Ota consists of a hierarchy of roads ranging from the express road which runs from the toll gate, passes through Sango, and to Abeokuta, likewise, the Sango-Owode Idiroko road which runs from Sango passes through Ota City centre to Owode Idiroko axis. The road is an international road as it terminates at the Benin Republic border (Figure 3).

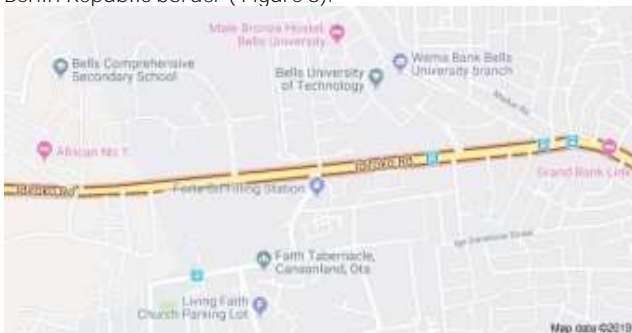


Fig 3. The study route (Source: Google Earth, 2023)

The structure of development in Ota can best be explained within the framework of the two primary roads that were intercepted within the city. The roads connect the city to Lagos (the commercial hub of the country) and also to Cotonou (an international trade route). Owode -idiroko Road is a trunk 'A' road, constructed to link Sango-Ota to the border town of Idi-iroko and the Benin Republic (Cotonou). It is a two-way road that serves as an intercity transit corridor as well as an international corridor. The basic features of the road include a dual carriageway of 18 meters in width; no drainage and good shoulders; the road is divided with a concrete barrier between the Sango and Winners Chapel location; the road provides access to all abutting plots with no restriction to parking. The Sango-Winner corridor of the road is a distance of 10.5km.

This section provides access to major land uses such as the industrial estate, Ogun State housing estate; Ota Judicial complex, Ogun state hospital, Ota; the Bells University of technology; Covenant University, Obasanjo Farms, and a host of other industrial and commercial land uses including major city market, (Ajala 2017). The arterial roads in Ota can be seen from the road network starting from Oju-ore, which links Iganmode road and terminate at the express (Lagos Abeokuta express). The Iganmode road also links some other major roads within the city such as Osi road, Abebi road, etc, and terminates at Itele road which runs to Command road and Ayobo Ipaja all in Lagos State.

Concept and Literature review

Concept of physical activity and well-being

A physically active lifestyle can significantly reduce the risk of obesity and a variety of chronic diseases including coronary heart disease and type 2 diabetes (Physical Activity Guidelines Advisory Committee, 2008). Some evidence suggests that engagement in particular types of moderate-intensity activities, such as walking and cycling, may be associated with positive health outcomes: for example, adults who regularly walk or cycle to work have higher levels of cardio-respiratory fitness than those who do not (Hamer and Chida, 2008) and commuter cyclists have a lower mortality risk than non-cycling commuters, independent of overall physical activity levels (Andersen, et al.,2009). Promoting active commuting represents a population approach to increasing physical activity levels; by encouraging everyone to be a bit more active, it may be possible to improve health outcomes across a whole population rather than targeting specific risk groups.

Physical activity refers to any action taken that results in the movement of the body either through exercise, or transport from one place to the other. Active commuting through walking and cycling has been regarded in this study as physical activity which ensures healthy growth, and development and enhances thinking, and learning in an individual who chooses to engage in it. Physical activity is proven to help prevent numerous diseases, shape the body into fitness, and improve mental health, quality of life, and well-being. It is therefore believed that physical health enhances well-being in children and young people because the children and younger ones are more active in making use of the active commuting (cycling and walking) during their leisure time and as recreation than adults. Well-being, therefore, refers to the balance of the spectrum of health elements in one's life in which active commuting is one of the means that promotes positive health behaviours as physical activity promotes mental and physical well-being. On this note, it can be said that physical activity through active commuting (cycling and walking) influences well-being because it contributes to mental health, makes one's work productive, and also perceived that life is going well with a high level of satisfaction and happiness with what doing.

Literature review

Evidence from the relatively small number of controlled studies which have explored the impact of interventions on cycling behaviour suggests that their effects have generally been modest and of uncertain statistical significance (Yang, et al.,

2010). Interventions to promote walking have a somewhat stronger evidence base, although their effectiveness may depend on being targeted in specific groups or settings (Ogilvie *et al.*, 2007). It is important to explore the benefit of active transportation and the necessary prerequisites for engaging commuters in active modes of transport. Many of the studies are investigating the different levels of satisfaction of adults from the use of different transportation modes, as well as the factors that affect their choice of a specific transportation mode (Paez and Whalen, 2010). Significantly, a higher level of satisfaction from travel has been reported for pedestrians and cyclists but also for train commuters rather than for drivers and bus and metro users (St-Louis *et al.*, 2014).

Also, cycling is the preferable commuting mode, and specifically cycling is three times more likely to be chosen by males. Furthermore, men engage in the walking activity for going to work while women are more likely to walk for escorting their children to school and running errands (Mathews *et al.*, 2009). Age also plays an important role in being active (Lee *et al.*, 2017) since young people tend to walk more and use their bicycles more than older people. Further, inactivity tends to rise with age, and it is a relatively high level in high-income countries. In addition, Yang *et al.* (2012) found that men are cycling more than women. A study by Weave *et al.* (2004) showed that a large percentage of 95% of adults are physically inactive, while younger children are more active.

The study of Faulkner *et al.* (2009) showed that children who walk or cycle to school presented greater physical condition and healthier body weight ratio. Also, Wadsworth *et al.* (2015) investigated the associations between children's active travel to school and non-school destinations. According to their findings, active travel to non-school destinations was positively related to children's daily moderate-to-vigorous physical activity, in contrast to active travel to school. Therefore, it can be said that walking and cycling can be enhanced through infrastructure development as one major means to promote the well-being of the people. Hence, the purpose of this study is to determine the home-school-home commuting practices of school students and to know the rate at which their physical activity enhanced their well-being.

Methodology

This research study used both primary and secondary data sources. The primary data such as sex, means of transport, benefits of active commuting, the preferred mode of transport, the effectiveness of the road, and assessment of commuting users' well-being were obtained through a questionnaire. Secondary data such as the number of schools in Ota was obtained from the Zonal Education office and Maps from Google Earth. Multi-stage sampling method was adopted to avoid bias in the choice of variables (schools) in the study area because the schools in Ota are numerous and spatially located. This sampling procedure allows the taking of samples in stages using smaller and smaller sampling units at each stage. It is a type of sampling which involves dividing the population into sub-groups (units). Then, one or more zones/units are chosen at random and every item within the chosen units has the chance of being selected or sampled.

However, for this research work, the following sampling stages were adopted: At stage one, the total number of public schools in Ota was identified and classified into primary and secondary schools (Table 1). There are twelve public primary schools and eight public secondary schools According to Neuman (1991) "large populations permit smaller sampling ratios for equally good sample". Therefore 50% of the total population sample frame was sampled, having six (6) primary schools and four (4) secondary schools in the study area. At stage two, Ota was divided into three zones such as core, transition, and emerging sub-urban.

Table 1. List of Public schools in Ota

S/N	Name of Public Schools	Number
1	St. Michael Primary School 1	Primary
2	St. Michael Primary School 2	Primary

3	St. Andrew Practising school 1	Primary
4	St. Andrew Practising school 2	Primary
5	St Peters Nursery and Primary School 1	Primary
6	AUD Comprehensive College Ota	Secondary
7	Sango-Ota High School	Secondary
8	Anglican Grammar School Ota	Secondary
9	Community High School Igbala Joju (Junior)	Secondary
10	Local Government Primary School 2	Primary
11	St. James Nursery. And Pry. School 1	Primary
12	St. James Nursery. And Pry. School 2	Primary
13	Iganmode Grammar School (Senior)	Secondary
14	AUD Comprehensive High School Lafenwa	Secondary
15	Zion Methodist Primary School 1	Primary
16	St Peters Nursery and Primary School 2	Primary
17	Zion Methodist Primary School 2	Primary school
18	Local Government Primary School 1	Primary school
19	Iganmode Grammar School (Junior)	Secondary
20	St Michael High School (Senior)	Secondary

Source: Author's field work, 2023.

The selected schools from the three zones were considered as the sample size for this research study. The selection of a zone, as the sampling frame for this research work, from each category in the study area is based on the following considerations:

1 In the core zone of secondary school: researchers randomly selected Iganmode secondary school, St. James Nursery/Pry. Schools 1 and 2, have a total number of three schools selected as sampling frames from the core.

2 In the transition zone: For secondary schools; Anglican High School and AUD Comprehensive College were selected, while St. Michael Nur. /Pry. Schools 1 and 2, therefore have four schools from the transition zone.

3. In the sub-urban zone: The secondary school selected is Community High School, while the primary schools selected are St. Local Government School 1 and 2, having a total number of three from the suburban zone.

Random sampling was adopted to administer a total number of 20 questionnaires to students in the ten (10) selected schools, having therefore 200 questionnaires administered. Some questions were analysed using descriptive analysis while other parts of the question such as an appraisal of road infrastructure performance and assessment of active commuting on well-being indicators were analysed using a five-point Likert scale. The method of analysis used in this research is the mean score ranking technique. Point scales were used to calculate the mean score for each response factor or option. The mean scores were then used to rank options in descending order of importance. The mean score for each factor or option was calculated by using the following formula $MS = \frac{\sum(f \cdot XS)}{N}$

Where s is the score given to each factor by respondents, f is the frequency of each rating for each factor or option and N is the total number of responses for that factor or option. The mean score is a weighted average for the responses received for each question. The mean scores were calculated by first multiplying the number of respondents by the weight of the response option to determine the weighted value. Total numbers of respondents were calculated for all rating options.

The calculated weighted value is divided by the sum of all respondents, giving the mean. From the five-point Likert scale, formulas used to calculate sample standard deviation and mean are, $Mean = a + \frac{\sum fd}{\sum f}$

Results and discussion

Sex composition of the respondents

The student's sex composition was analysed. It was revealed that there are more male active school commuters compared to females. Male commuters made up 114 respondents which is 57% of the total sample population while the female had 86

representing 43% of the population. This showed that male students were more involved in active commuting than females. The findings corroborate with Yang *et al.* (2012) who also noted that men are cycling more than women. This indicated that the wellness and quality of life of male students tend to increase more than the female students in the study area.

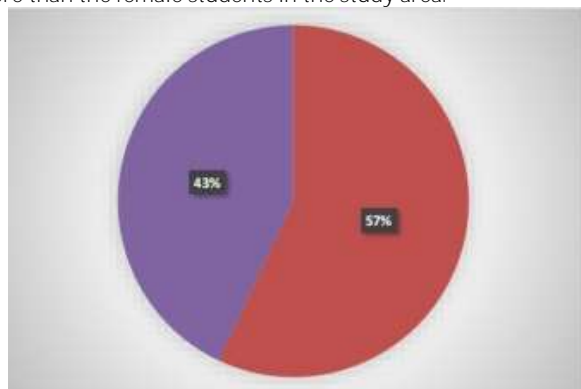


Fig 4. Student's sex composition (Source: Author's Field Survey 2023)

Choices for other modes apart from walking or cycling

Active commuting (walking/bicycling) to school is associated with higher levels of physical activity among children (Pizzaro *et al.*, 2013) and it is a method by which the youth can build physical activity into their daily routines (Owen *et al.*, 2012). Figure 3 showed that a higher percentage (96%) of the respondents preferred the usage of cycling owing to their knowledge and benefits achieved from using it, while the remaining 4% noted that they preferred other modes to cycle owing to the stress and energy exerted in driving. It was observed by the researcher that those that preferred it to other means of transport are female. This indicated that many of the respondents were aware of the health benefits and also derived happiness in using it. It is therefore recommended that health experts should inform the public and encourage school children to make use of cycling to school, also the government should provide and repair the road to encourage the user.

Appraisal of road effectiveness and efficiency towards the active commuter users well-being

Table 2 is a template, developed by the researcher to examine the effectiveness, efficiency, and satisfaction index of the respondents, hoping that the outcome of the results would be used by the stakeholders involved in the construction and maintenance of standard roads to achieve better well-being of the users and the residents. The researcher tried to explain the technical term used in Table 2 to all the school respondents to obtain correct results on the effectiveness and efficiency of the road and also to determine the respondent's satisfaction index.

Table 2. Effectiveness and efficiency of the road performance assessment (Please indicate scale 1-5. 1- Strongly disagree, 2- disagree, 3- undecided, 4-Agree, 5- Strongly agree.

Effectiveness and efficiency Indicators	1	2	3	4	5	Total	Mean score
Delineation of traffic (vehicular and human)	86	60	46	6	2	200	2.32
Is there pedestrian walking or pavement	82	71	34	9	4	200	1.91
Are there road signs (children crossing zebra paint, children crossing etc)	79	82	26	8	5	200	1.89

Does the road lines provided	19	20	30	59	72	200	3.76
Is there a cycling lane	24	61	14	1	0	200	1.46
Are there traffic line or road bumps	27	19	21	64	69	200	3.65
Are there road markings	132	44	8	7	9	200	1.59
Official bus stop	92	64	31	9	4	200	1.85

Source: Author's Fieldwork,2023.

Road lines have the highest mean score of 3.76. Table 2 revealed that road lines have the highest mean value of 3.76 in assessing the effectiveness and efficiency of roads for active school commuting. Others include road bumps, delineation of traffic, pedestrian walkways or pavement, road signs, official bus stops, road markings, and absence of cycling lanes with the value of the mean score, 3.65, 2.32,1.91,1.89, 1.85,1.59, 1.46 respectively. The level of satisfaction with the performance of the road infrastructure in the study area is directly proportional to its mean score as indicated in Table 2. The results indicated that the existing road in Ota lacks necessary amenities and services, not to standard in line with physical planning standards. The findings of cycling users' satisfaction level on the performance and effectiveness of road infrastructure in Ota revealed the poor conditions of the existing road which resulted in poor mental health conditions for the users. This result is expected to inform urban transport planners and engineers of the inadequate or absence of some road infrastructure amenities and services. It is therefore recommended that policymakers should take into consideration the necessary road amenities and services for the better sustainable quality of life of the residents, especially the school children.

Assessment of active commuting users towards well-being

Different experiences that a young person has at one point in time influenced their well-being by everything around them. The experiences of the children and young persons using cycling to school can influence their well-being. In the study area, the active school commuting users' well-being was examined using the Scottish Government well-being description in terms of 8 indicators Safe, Healthy, Achieving, Nurtured, Active, Respected, Responsible, and Included. The indicators were examined in Table 3 to determine the performance of the road and the satisfaction level of the active school commuting users.

Table 3. Ranking of the benefits derived from using active commuting using well-being indicators by the active commuting users (Please indicate scale 1-5. 1- Strongly disagree, 2- disagree, 3- undecided, 4-Agree, 5- Strongly agree.

Well-being Indicator and description	1	2	3	4	5	Total	Mean score
Safe: Protected from abuse, neglect or harm at home, at school and in the community	25	27	17	62	69	200	3.63
Healthy: have the highest attainable standards of physical and mental health, access to suitable healthcare and support in learning to make healthy safe	21	21	32	52	74	200	3.69
Choices: Being supported and guided in learning and in the development of skills, confidence	14	24	16	62	84	200	3.89

and self-esteem, at home, in school and in the community.							
Achieving: Being supported and guided in learning and in the development of skills, confidence and self-esteem, at home, in school and in the community	25	41	28	51	55	200	3.35
Nurtured: offer help if needed, or where this is not possible, in a suitable care setting	42	36	27	33	62	200	3.14
Active: have opportunities to take part in activities, such as play, recreation and sport, which contribute to healthy growth and development, at home, in school and in the community	12	14	14	77	83	200	4.07
Respected: Having the opportunity to participate in decisions that affect you	65	40	13	46	36	200	2.74
Responsible: Having opportunities and encouragement to play active and responsible roles at home, in school, and where necessary, obtaining appropriate guidance and supervision, and being involved in decisions that affect you	10	22	15	67	86	200	3.98
Included: receiving help and guidance to overcome social, educational, physical and economic inequalities and being accepted as full members of the community in which you live and learn	44	35	12	53	56	200	3.21

Source: Adapted from Scottish Government leaflet, (2016) and Author's survey (2022).

Table 3 revealed that the school children's experience with active commuting influenced their well-being. The Well-being indicator in Table 3 indicated that the active factor has the highest mean score of 4.07; this implied that the students involved in active commuting participated in various activities that promote the healthy growth and development of the students. A responsible factors with a mean score of 3.98 indicated that active school commuting has the opportunities to play active and responsible roles in school and at home. Others include choice, health, safety, achieving, included, nurtured, and respected with the value of the mean score, 3.89, 3.69, 3.63, 3.35, 3.21, 3.14, and 2.74 respectively in order of importance and satisfaction with the active school commuting users in Ota. This implied that active commuting by cycling influenced the well-being of the users and is beneficial. to their health.

Conclusion and recommendations

Active commuting is a subset of physical activity that promotes health status, happiness, satisfaction, and mental health, enhancing well-being. Efforts to promote active

commuting may be most effective not only when emphasizing the potential health benefits, but by improving and emphasizing the relative convenience, and improving on-road amenities for the wellness of the users. From the findings, it is assumed that students in Ota would embrace active commuting to school if there is a provision for cycling lanes and a good standard road for the safety of cycling users in the area. Government should provide adequate and standard infrastructure facilities to promote public health for better living for the people.

The findings in this work provide unique information on active commuting in school children which could be used to inform health care providers and public health authorities about the promotion and facilitation of active commuting in children and adolescents. Also, the findings are expected to assist the head of schools in public primary and secondary schools to understand in depth the importance and benefits of active commuting and this will encourage them to provide quality physical education that supports children to develop behaviour patterns that will keep them physically active throughout their lives. Local governments also can encourage the residents by organizing a seminar, and workshops for the residents and even organizing active commuting sports competitions for school children and young ones in their jurisdiction. Active commuting is associated with higher levels of physical activity and is a means toward sustainable wellbeing.

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