

GLOBAL JOURNAL OF ADVANCED ENGINEERING TECHNOLOGIES AND SCIENCES**THE CONTRIBUTION OF URBAN PLANNING AND ITS IMPLEMENTATION TO THE BEHAVIOR OF MEDAN CITY RESIDENTS TO THE LEVEL OF HEALTH****Kaspan Eka Putra**

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ABSTRACT

As the region progresses, there are many cities currently experiencing transportation problems, such as traffic congestion. In addition to traffic congestion problems, other problems that can be generated are health problems due to decreased use of active transportation such as walking and cycling. The purpose of this study is to determine the effectiveness of walking habits can improve public health status. This research uses quantitative approach with data analysis technique with Structural Equation Model (SEM). The results showed that high economic and social tends to do physical activity. The choice of residence location also gives effect to physical activity. The choice of non-motorized modes such as walking and bicycles can increase physical activity. Good and comfortable pedestrian facilities will encourage people to walk for short-distance trips, so that physical activity will increase. Increased physical activity will have a good effect on health. The travel behaviour of citizens for travel purposes will be able to reduce the risk of disease.

KEYWORDS: travel behaviour, congestion, health.**INTRODUCTION**

For urban residents, active transportation, walking or cycling to local destinations, is an important source of physical activity. The health benefits of physical activity such as walking and cycling can lower the risk of cardiovascular disease, higher bone mineral density, and better psychosocial health.

Public health, comfort of residence, and community welfare are the main factors in the smoothness of life which is also an interesting topic in the academic field. This explains that public health has a strong correlation with a variety of factors including land development, urban forms and elements of the transportation system (Langerudia et al 2014). The choice of modes of transportation has an impact on physical, mental and environmental health and this has been recognized by academics, practitioners and decision makers (Cavoliaat al.2015).

Recent studies have shown that health improvements can result from unpaid physical activity in long-term routine activities (Middleton et al., 2010). Public health researchers have supported a policy of promoting walking as a more effective approach to physical activity (Ogilvie et al 2007). Walking behavior can be considered as an important factor in physical activity and walking behavior has a close relationship with the ability to walk on the level of health owned by each individual (Azmi et al. 2012).

Active transport requires appropriate land use policies, where special paths such as pedestrian and bicycle paths are required to attract people to use active transportation (Khreis et al, 2016). Other research says that increased levels of awareness of physical activity need to combine health with the areas of transportation design, planning and policy making. This means that knowledge transfer, research, policy and practice will play an important role in promoting healthy transportation practices such as walking and cycling (Adams and Cavil, 2015).

To facilitate access with this mode of transport, there needs the integration of land use and transport planning and promoting active transport, but this option has constraints for people who are far from the city center where too far away from the workplace, it is not possible to travel on foot or cycling. In other words, the location of the residence will affect the travel behavior of the people who are more dependent on the use of motorized transportation (Ettema and Nieuwenhuis, 2017).

Therefore, this research will analyze the influence of respondent characteristics measured from the economic and social condition of a person, the choice of residence location and the mode of transportation, the frequency of the use of pedestrian to the physical activity of a person and its influence on health. Whether by doing

walking habits can improve the health status of the community. Based on the above problems, it is necessary to do research to determine the effectiveness of walking habits can improve the health status of the community.

LITERATURE REVIEW

Characteristics of society such as social conditions and economic circumstances affect the health gap a person seen from the selection of modes of transportation (Borell, 2014). The choice of transportation modes also affects the health of transport users (Langerudia et al. 2015; Badland et al. 2015; Badland et al., 2014, Cavoli et al., 2010) the use of public transport and active transport (walking and cycling) instead of cars is an attractive strategy to increase physical activity (Yang et al, 2015).

Using active transport (walking and cycling) from residential location to workplace will lower the risk of obesity (Smith, et al, 2008), other studies also reveal that a person will have active transport if the distance is relatively close (Larsen et al, 2010).

Physical activity such as walking and cycling affect public health (Wee and Ettema (2015), Heinen et al, 2014, the effectiveness of walking can improve health (Ogilvie et al., 2007) .Physical activity such as walking and cycling in early childhood can have an impact positive on child and adult health (Oxford and Pollockb, 2015).

The use of land to be a comfortable pedestrian for the population can encourage the walking (physical activity) (Untermann, RK, 1986). The use of land for the bicycle lanes can also encourage the increased use of bicycles by the community so as to increase physical activity and its effects on health (Crane, 2015).

RESEARCH METHODE

This study aims to determine the relationship between the characteristics, the selection of residential location and mode of transportation and frequency of use of pedestrian with a physical activity of a person with its influence on public health in Medan city. This type of research is analytic with survey method, through interview using questionnaire with cross-sectional approach. Each subject in this study was observed only once with quantitative ejection. The sample in this study is in the adult category from 21 years old to more than 55 years old. The research approach is quantitative with the data analysis technique described with Structural Equation Model (SEM) framework. With SEM method, the analysis is focused on identifying the characteristics of each respondent starting from income, choosing the location of residence, the mode of transportation and the frequency of pedestrian use with the association of walking habit (physical activity) on the health status of each respondent

DISCUSSION

Without a doubt, active transport (work, cycling, and use of public transport), transport systems, and urban designs significantly affect public health. A systematic review of 2013 on the relationship between active transport and health outcomes found that active transport was associated significantly with improvements in cardiovascular health and low weight (Saunders, et al, 2013).

Therefore, this study will examine the influence of five variables that are considered to affect the physical activity of a person by using SEM method.

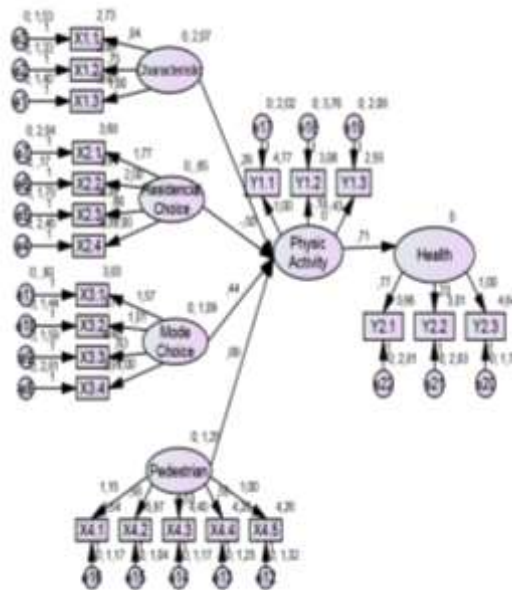


Figure 1. SEM result

In the picture there are 5 paths which will later answer the relationship between the five variables to be tested influence. The five variables that will be tested are respondent's characteristic, residential location selection, transportation mode selection, frequency of pedestrian usage of physical activity conducted by respondent. These five variables give an indirect effect on the health condition of the people in Medan City.

The relationship of these five variables can be seen in the table of SEM test results below:

Table 4.1 SEM test results

	Estimasi	S.E	CR	
Physic Activity ← Characteristic	0.258	0.098	2.640	0.008
Physic Activity ← Residential Choice	-0.501	0.149	-3.362	***
Physic Activity ← Mode Choice	0.437	0.121	3.624	***
Physic Activity ← Pedestrian	0.892	0.141	6.325	***
Health ← Physic Activity	0.709	0.124	5.738	***

In previous studies there was a tendency for researchers to examine the effect of travel distance and the selection of modes of transport on physical activity, (Hérick de Sá, et al., 2015, Langlois et. al, 2015), but in this study, the researcher wanted to know how the respondent characteristics factor, choice of distance of location of residence, choice of mode of transportation and frequency of use of pedestrian can influence one's physical activity and so affect one's health.

The relationship of these five variables can be seen in the SEM test results below:

Table 4.2 SEM test results influence the characteristics of respondents and physical activity

	Estimate	S.E.	C.R	P
Physic Activity ← Characteristic	0.258	0.098	2.640	0.008

The SEM calculation results as presented above indicate that the characteristics have a positive effect on physical activity. This can be seen from the coefficient of the path marked positive by 0.258 with a CR value of 2640 and obtained a significant probability (P) of 0.008. This means that when characteristics such as age, economic and social status of a person increasing, then the use of the mode of active transport will increase as well but not in the context to travel but for recreation and exercise. In this study the characteristics of the respondent are age (X1.1), economic conditions (X1.2) and social conditions (X1.3).

The selection to do physical activity was influenced by the characteristics of respondents in this study measured by the factors of age, income and social conditions of a person. Where in this study there is a tendency of higher age, economic status and social, then the increased physical activity. But the activity is not the use of active transport for travel but to be a physical activity for recreation and exercise such as walking or cycling (Biddle et al, 1998). This is evident from the number of respondents who have high incomes will tend to use motor vehicles to do the trip compared to using active transportation to travel to the workplace.

The better the economic level of a person, the more aware and concerned about health. Health care is done by doing sport actively in spare time, so that people with high economic levels of high physical activity in their daily life.

So is the age group. Increasing the age of a person the higher the awareness of health is by taking a healthy life in everyday life such as exercise and other physical activities.

Respondents with better social will tend to care about health because they have enough knowledge about healthy lifestyle and do good physical activity for health

The following can be seen the effect of the selection of residential location to physical activity.

Table 4.3 Result of SEM test of the influence of the selection of residential location to physical activity

	Estimate	S.E.	C.R.	P
Physic Activity ← Residential Choice	-0.501	0.149	-3.362	***

The result of SEM calculation as presented above shows that the choice of location of residence has a negative effect on physical activity. This can be seen from the coefficient of paths with negative sign of -0.501 with CR value of -3.362 and obtained a significant probability (P) of 0.000. This means that when the distance to the location of the residence further away will be a decrease in physical activity of a person. Distance of the location far away from the place of destination is less effective when using an active transport such as walking or cycling due to wasted time on the trip. It turns out that the population is located far from the city center, precisely the suburbs are very rarely do physical activity. This is due to the use of transportation mode to daily travel destinations using many private motor vehicles and few use of public vehicles. This condition causes a decrease in physical activity.

The following can be seen the influence of the selection of modes of transport to physical activity.

Table 4.4 SEM test results influence the selection of modes of transport on physical activity

	Estimate	S.E.	C.R	P
Physic	0.437	0.121	3.624	***

	Estimate	S.E.	C.R	P
Activity ← Mode Choice				

The SEM calculation results as presented above indicate that the selection of modes of transportation has a positive effect on physical activity. This can be seen from the coefficient of the path marked positive by 0.437 with a CR value of 3.624 and obtained a significant probability (P) of 0.000. It indicates the selection of non-motorize modes such as walking and bicycles can increase one's physical activity for daily activities such as work and other daily trips.

The following can be seen the effect of existing pedestrian conditions in urban areas in accordance with residential zones in Medan city on physical activity. The results showed as follows:

Table 4.5 SEM Test results of pedestrian influence on physical activity.

	Estimate	S.E.	C.R.	P
Physic ← Activity ← Pedestrian	0.892	0.141	6.325	***

The SEM calculation results as presented above indicate that the availability of pedestrian facilities has a positive effect on physical activity. This can be seen from the path coefficient marked positive by 0.892 with CR value of 6.325 and obtained a significant probability (P) of 0.000. This means that when the pedestrian facilities are built properly, it can increase the interest of the residents to walk for short trips, thus increasing the physical activity of the residents. When land use for pedestrians is properly allocated and built with a comfortable concept, people will be encouraged to walk on the pedestrian so that physical activity will increase as well (Untrmann, R K, 1986; Crane, 2015).

By knowing the variable of physical activity of Medan city residents, hence contribution of this physical activity can influence citizen health level. This can be seen from the results of research as following:

Table 4.6 SEM test results of physical activity influence on health.

	Estimate	S.E.	C.R.	P
Health ← Physic Activity	0.709	0.124	5.738	***

SEM calculation results as presented above show that physical activity has a positive effect on health. This can be seen from the coefficient of the path marked positive by 0.709 with CR value of 5.738 and obtained significant probability (P) of 0.000. This means that when physical activity increases due to economic social characteristic factors, the choice of residence location, the selection of modes and the availability of pedestrian can contribute to the health level of the city residents. There have been many studies suggesting that a lack of physical activity can lead to a number of poor health conditions including obesity (Donaldson, 2003; Ogilvie et al., 2007; Wee and Ettema, 2015).

CONCLUSION

The results of this study indicate that the characteristics of people with high economic and social tends to do physical activity. The choice of location of residence also gives influence to physical activity, where the further the location of the residence with the purpose of travel, the physical activity of the citizens will be reduced. The choice of non-motorize modes such as walking and bicycles can enhance a person's physical activity in travel for daily activities such as work and other daily trips. The behavior of citizens' journeys in urban areas with the availability of good and comfortable pedestrian facilities will encourage people to walk for short-distance trips, so that physical activity will increase.

Increased physical activity will also have a beneficial effect on health, where the daily travel behavior of day-to-day, residents will be able to reduce the risk of disease. Thus, urban planning has implications for travel behavior with non-motorized transport (active transportation) that can play a role in improving public health in

urban areas.

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