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Built Environment and Physical Activity: A Study of Chinese University Faculty Members

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Abstract

Built environments can affect individuals' physical activity levels and may stimulate self-efficacy, allowing them to use the environment more effectively for physical activity. However, little is known about the mediating and moderating mechanisms underlying this relation. This study aimed to investigate (a) the mediating role of self-efficacy in the association between built environment and physical activity level and (b) the moderating role of exercise benefits in the indirect relationship between built environment and physical activity level. Method: The participants were 553 Chinese university faculty members. They completed a questionnaire which focused on their build environment, self-efficacy, exercise benefits, and physical activity level. A review of the literature revealed that high self-esteem could be a protective factor against smartphone addiction for adolescents with a strong need to belong. These students appeared to be at an elevated risk of developing smartphone addiction. The present research found that the built environment and physical activity level were closely linked, and self-efficacy partially mediated the built environment and physical activity level. Exercise benefits had a moderating effect on the built environment and physical activity level. As the level of the benefits from exercise increases, the predictive effect of the built environment on the level of physical activity also increased gradually.

Keywords: *Built environment, Self-efficacy, Exercise benefits, University faculty, Physical activity level*

1. Introduction

Physical activity levels are strongly associated with health(Wang & Chen, 2012). Modern production and lifestyle have increased the efficiency of work and inevitably brought about many problems caused by the reduction of physical activities (Atkinson et al., 2016; Wei & Hou, 2007). University faculties are typically physically inactive groups, spending more than 75% of their time sitting on college campuses (Fountaine et al., 2014). Less than one-third of professors meet the recommended Physical Activity guidelines(Kirk & Rhodes, 2012). Health problems of university

faculty are now a common phenomenon in universities, and both male and female faculty need special attention(Li et al., 2013; A. Zhao, 2013; Y. Zhao et al., 2006). As a major component of the national strategy to develop the country through science and education, the level of physical function and health of university faculty are directly related to the rise and fall of China's socialist education and the people's livelihood (Zhang et al., 2010). Therefore, analyzing university faculty's physical activity level and exploring the path to promote the healthiness of university faculty is one of the important elements of implementing the national health strategy.

The urban built environment is the outside public space and buildings that can be adapted and controlled by human design, modification, and construction, as opposed to the natural environment, particularly those that can be changed by policy and human action (Kaczynski & Henderson, 2007; Kerr et al., 2012; Robert et al., 1997). The main components of the built environment include the siting and design of a residential, commercial, office, school, plaza, and other buildings, as well as the siting and design of walkways, bikeways, greenways, and roads (Handy et al., 2002). The built environment is a combination of elements related to building density and intensity, land use, transportation systems, safety, and urban design. It is a man-made space where people live, work, and play. The built environment has no strict spatial constraints and can be a streetlight in mid-air or a subway underground(Handy et al., 2002; Roof & Oleru, 2008; Saelens & Handy, 2008). From the perspective of public health, the built environment refers to the urban planning environment. It influences individual physical activities within a certain geographic space, including building, mixed land use, street articulation, street density, landscape aesthetic quality, and regional spatial pattern (Chen et al., 2014).

As a core concept of social cognitive theory, self-efficacy is often used to explore and analyze important variables for engaging in behavior change (McAuley et al., 2005). It is a self-confidence theory that investigates the individual's ability to deal with various life stressors (Zimmerman, 2000). Now paragraph self-efficacy also includes task self-efficacy, scheduling self-efficacy (regular scheduling exercise), time management, and coping self-efficacy, which is better able to discriminate between active and inactive individuals in exercise(Maddux, 1995). Studies have confirmed that self-efficacy could have a positive direction or indirect effect on people's health behavior choices, including physical activity. Individuals' beliefs about their ability to perform sports in the field of physical activity are the confidence required for individuals to sustain regular movement under many specific conditions (Wu et al., 2002). Self-efficacy for physical exercise becomes important since it determines in part one's motivation to practice physical activity and is one of its most powerful predictors (Du et al., 2012).

Two of the cognitive/perceptual determinants in the Health Promotion Model are perceived benefits of health-promoting behavior and perceived barriers to health-promoting behavior (Sechrist et al., 1987), which means that cognitive behavior theory contends that an individual's readiness to engage in preventive health behavior is a function of their perceived threat associated with that behavior. Research using perceived benefits as predictors of health behavior has been inconclusive, and others reviewing the physical activity literature have reported that initial motivation to participate in physical activity may be related to the activity's perceived benefits (Dishman et al., 1985). The perception of benefits is constituted of positive mental representations that involve factors that reinforce, facilitate, nurture and enable the adoption of a behavior.

The benefits can be intrinsic (improving health, feelings of well-being) or extrinsic (social interaction, financial reward) (Silva et al., 2011). The analysis of factors influencing adult women's participation in physical activity showed that women who perceived benefits from physical activity over barriers were more motivated than those who perceived barriers from physical activity over benefits(Vaughn, 2009). Some studies have also analyzed their perceptions of the benefits and barriers to physical activity based on questionnaires and have suggested corresponding exercise interventions (Kelly et al., 2016; Oja et al., 2017). The perception of benefits is constituted of positive mental representations that involve factors that reinforce, facilitate, nurture and enable the adoption of a behavior. The benefits can be intrinsic (improving health, feelings of well-being) or extrinsic (social interaction, financial reward) (Pender et al., 2010).

In summary, self-efficacy and exercise benefits can provide a new perspective on the physical activity level of college teachers in their built environments. Specifically, whether the built environment has a direct positive impact on self-efficacy and physical activity level, or, whether self-efficacy is enough to play an intermediary role in this are some of the questions which need to be empirically tested. The research reported in this article examines the structural relationship between the built environment, self-efficacy, exercise benefits, and physical activity level, and proposes a mechanistic model for the influence of the physical activity level of college teachers.

2. Literature Review and Research Assumptions

2.1 Relationship between Built Environment, Physical Activity and Self-efficacy

Built environment refers to the urban planning environment that can affect individual physical activities within a certain geographical space range, including mixed land use, transportation system, and the combination of a series of elements and characteristics related to urban design(Ding & Gebel, 2012). According to the ecological model of physical activity, the research on the influence of the built environment on physical activity is deepened, and engagement Conn tended that the built environment has a direct effect relationship with physical activity and self-efficacy, respectively(James F. Sallis et al., 2012). When residents live in high-density communities with mixed land use, public transportation-oriented development mode, and high street walkability, they can reduce the daily use of cars and adopt active travel modes such as walking, bicycle, riding, and public transportation, thus increasing the level of physical activity (Handy et al., 2002; McCormack & Shiell, 2011; Wang et al., 2019; Zhao et al., 2018)

Researchers have explored the relationship between building environments and sports lifestyles (Harris et al., 2013; Van Holle et al., 2012). Environmental characteristics have been found to be related to the possibility of physical activity in countries regardless of income levels (Hallal et al., 2012). Sufficient and well-designed transportation facilities positively impact the physical activity level of community members (Ding et al., 2011). The number of intersections and street lamps are positively correlated with more physically demanded made of transportation such as walking and riding, while what is the characteristic of street connectivity affects the P.A. can promote physical activities (Smith et al., 2017). The accessibility of sports facilities, parks, living facilities, and other destinations is positively correlated with physical activity engagement. When it is perceived that the accessibility of physical activity facilities near their residence is

better, the number and amount of physical activity will also increase (James F. Sallis et al., 2012). Based on this, this study proposes that the built environment has a positive impact on physical activity and puts forward hypotheses:

H1. The built environment positively affects the physical activities of university faculty.

The environment may stimulate residents' sense of self-efficacy, thus enabling them to make more effective use of environmental opportunities for physical activities (Baar et al., 2014). Especially in adult research, there is a correlation between environmental accessibility/convenience and self-efficacy(Rhodes et al., 2020). The built environment is directly related to self-efficacy in the study of elderly African Americans (Sweeney et al., 2017). Based on GIS research, self-efficacy has an obvious correlation with walking index, park, and entertainment facilities count (Wang et al., 2017). By measuring the high walking ability (high residential density, high land use mixed access, and high land use mixed diversity) and the convenience of recreational facilities in the community. It is found that self-efficacy is one of the strongest social-psychological relationships between the built environment and psychosocial correlation (Greef et al., 2011). Based on this, this study proposes that a built environment has a positive impact on self-efficacy and puts forward hypotheses:

H2. The built environment positively affects the self-efficacy of university faculty.

One's maintaining a positive life. The self-evaluation of activities is called self-efficacy. Generally, it refers to the belief in personal ability and the ability to satisfactorily fulfill necessary needs under different circumstances (Bandura, 1982). According to the classical theory of physical sports motivation and the social cognitive model (Bandura, 2004), self-efficacy plays a determinant role in the decision-making process (Ekkekakis & Dafermos, 2012). Self-efficacy is an important factor in physical activity (Wilroy et al., 2018). A physical activity survey among adults aged over 18 years old shows that self-efficacy is the most important factor in physical activity adoption (Rhodes et al., 2020). An evaluation of 121 faculty members at Washington University in St. Louis found that the self-efficacy of physical activity of the Campus Employees was related to physical activity (Aparicio-Ting et al., 2015). As a result, this study proposes that self-efficacy has a positive impact on physical activity. The following hypothesis is, there are stated:

H3. Self-efficacy positively affects the physical activity of Chinese university faculty.

2.2 Mediating Effects of Self-efficacy

Self-efficacy refers to the individual's confidence that can successfully carry out the expected behavior (Bandura et al., 1997). It is also considered the most powerful determinant of physical activity. The level and form of the effect of self-efficacy on physical activity adoption also vary on time and situation (Schwarzer et al., 2011). Bandura(2004) believes that self-efficacy is an important determinant because it directly affects healthy behavior, and people with higher self-efficacy expect beneficial results from physical activities (Bandura, 2004). Self-efficacy also plays a positive mediating role in the influence of the built environment on physical activity (Sreeramareddy et al., 2012). Social cognition theory can regard individual cognition (such as self-efficacy) as the mediator of extrinsic factors such as the architectural environment (Calogiuri & Chroni, 2014). In adult groups, self-efficacy is a mediating variable between environmental accessibility, convenience, and overall strength activities (Rhodes et al., 2020).

Based on this, this study puts forward that self-efficacy plays a mediating role in the influence of the built environment on physical activities and puts forward the following hypothesis:

H4. Self-efficacy has a mediating effect on the influence of the built environment on physical activities among university faculty.

2.3 Regulatory Effect of Exercise Benefits

In recent years, numerous studies on the influencing factors of sports behavior have recognized the influence of psychological characteristics and behavioral skills on sports behaviors (Salmon et al., 2003). The analysis of the factors that affect adult women's participation in sports shows that women who believe that benefits from physical activity are higher than barriers are more active than those who perceive otherwise (Rehm & Konkle-Parker, 2016). Based on the theory of social ecology, many factors in the physical environment, social environment, and personal factors, as well as the perception of benefits of physical activity (Robbins et al., 2009). In a survey of community residents, it was found that the influence of the built environment on physical activity, sports benefits, and barriers perception also plays a moderating role (De Oliveira et al., 2019). Therefore, the following hypothesis is proposed:

H5. Exercise benefits play moderating role in the impact of the built environment on physical activity among Chinese university faculty.

3. Methodology

3.1 Participants

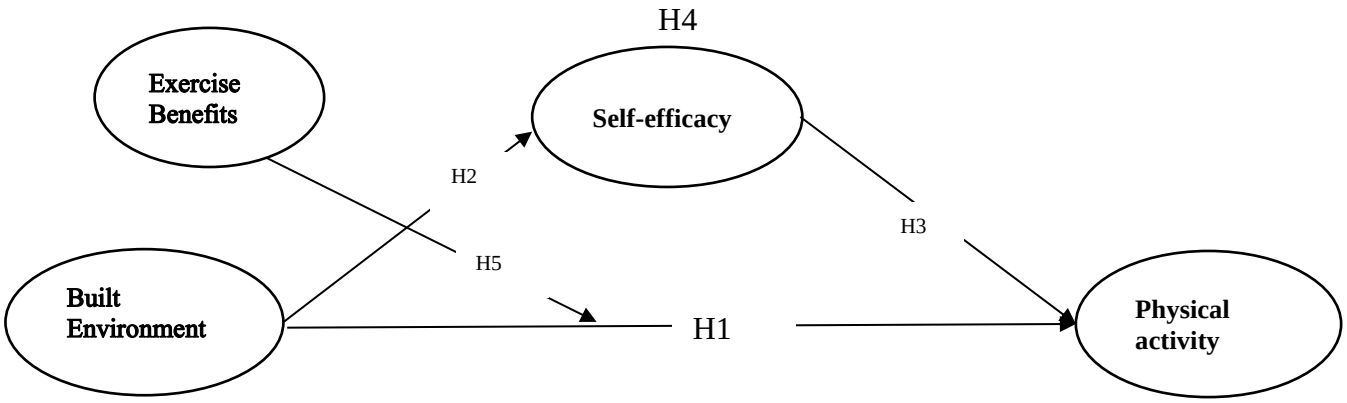

Figure 1 Proposed Model

A total of 620 university teachers in Zhejiang Province with different majors were selected. After excluding the invalid questionnaires, 553 valid questionnaires were recorded with an effective recovery of 89.19%. The age of the participants ranged from 24 to 59 years. Among them, 249 were male (45.03%), and 304 were female (54.97%). One hundred seventy-eight participants were majoring in humanities and social sciences (32.18%), 134 were majoring in science (24.23%), 143 were majoring in engineering (25.86%), and 98 were medical (17.72%). The study was approved by the Ethics Committee of the University.

3.2 Instrument

3.2.1 Measuring Level of Physical Activity

The International Physical Activity Questionnaire (IPAQ) was used to review the physical activity levels of university teachers in the most recent week, with reference to the World Health Organization《Guidelines of International Physical Activity Questionnaire for Data Processing and Analysis》and the calculation principle proposed by Fan Meng and others (Macfarlane et al., 2007). Levels of physical activity are classified into low, moderate, and high levels according to the amount of physical activity and the frequency and time of different types of physical activity in a week, and are classified according to at least three days of high-intensity physical activity in a week and a total amount of physical activity of at least 1 500 METs min/week, or traffic, moderate and/or high-intensity physical activity of 7 days or more with a physical activity volume of 3,000 METs min/week is a high level; high level of high-intensity physical activity in a week three days and at least 20 min per day, or at least five days of moderate physical activity and at least 30 min per day, or traffic, moderate and/or high-intensity physical activity of 5 days or more and total physical activity of 600 METs min/week is moderate; no physical activity was reported, or the standard of physical activity was low (Fan et al., 2014).

3.2.2 Built Environment Scale

The Physical Activity Neighborhood Environment Scale (PANES) was used to measure the living environment of university faculty. The test-retest reliability of the questionnaire was supported in several countries (Ding et al., 2011; Sallis et al., 2010). The environmental indicators covered include mixed-use of land, the convenience of public transportation, sidewalk infrastructure, bicycle facilities, entertainment and leisure facilities, social implications, and beautification of the environment. Residential density, criminal safety, traffic safety, and street connectivity proved to be no significant relationship between China's adult physical activity (Sallis et al., 2012)

3.2.3 Self-efficacy Scale

The Self-efficacy Scale originated from one subscale of the Physical Self-Efficacy Scale (PSES) by (Ryckman et al., 1982). Chinese researchers have translated and revised the scale and tested it. Using the second-order factor model, PPA (physical perception ability) and PAPC (physical ability perception confidence) are two secondary factors, and PSE (physical self-efficacy) is a first-order factor(Sun et al., 2005).

3.2.4 Exercise Benefits Scale

This paper adopts a simplified scale developed by Japanese scholars (Kaori et al., 2009). The scale includes 20 items: Exercise Benefits Scale (10 items: Can relieve pressure, relax mood, Can enjoy happily, Deepen friendship, Can maintain a suitable weight, Can improve appearance, Can be healthy, Can do with friends, Can enhance overall endurance, Can challenge possibility to deepen friendship, Can let others recognize their abilities.

4.3 Data Collection and Analysis

The data were collected at the Health test site between December 2021. Trained post-graduate students administered the measures using scripts and a manual of procedures to ensure standardization of the data collection process. Participants received a gift as an incentive after they

completed all questionnaires. All the scales were 7-point Likert type scales, based on "1" (strongly disagree), "2" (somewhat disagree), "3" (disagree), "4" (neither agree nor disagree), "5" (somewhat agree), "6" (agree), and "7" (strongly agree).

Statistical analyses. The analyses of moderation were constructed using Hayes's (2013) PROCESS macro (Model 5)(Hayes & Rockwood, 2017). All continuous variables were standardized, and the interaction terms were computed from these standardized scores. In addition, the bootstrapping method was applied to examine the significance of all the effects to obtain robust standard errors for parameter estimation(Hayes & Preacher, 2013). The bootstrapping method produces 95% bias-corrected confidence intervals of these effects from 5,000 resamples of the data. Confidence intervals that do not include zero indicate significant effects.

5. Results

5.1 Measurement model and Goodness-of-fit test

The structural model consists of a survey model and a structural model (Anderson & Gerbing, 1988)). The measurement model represents the relationship between the underlying variable and the observed variable. The structural model reflects the relationship between the potential variables (Wu, 2010)). The measurement model fitting parameters in this paper: $\chi 2/df=2.124$, CFI=0.976, IFI=0.967, TLI = 0.961, all of which reach a scale greater than 0.9 (Hu & Bentler, 1999)). RMSEA= 0.045, less than 0.08. This indicates that the measurement model has a good fit (Wu, 2010)).

5.2 Reliability and Validity Tests

The reliability test is an assessment of the internal consistency of the scale, and a general Cronbach's α coefficient above 0.7 indicates that the scale has high Reliability (Wu, 2010)). Analysis by SPSS software shows that Cronbach's α coefficient of the total measured table is 0.871. The built environment, exercise benefits, dyskinesias, self-efficacy are 0.918, 0.972, 0.920, 0.868 (see Table 1). These tests show that the scale and its dimensions have good reliability.

The validity test is evaluated by convergence validity and discriminant validity. Convergence validity refers to measuring the correlation between different question items of the same variable (O'Leary kg Elly & Vokurka, 1998). Convergence validity is judged by a factor load greater than 0.5, significant p-value, composite Reliability (C.R.) greater than 0.6, and average variance extracted (AVE) greater than 0.5 (Wu, 2010).

From Table 1, it can be seen that the factor load value interval of each measurement item is 0.655~0.927, and the value of each question is significant($p<001$). C.R. is 0.746 to 0.972, and AVE is 0.509 to 0.779, indicating that the underlying variables have a good convergence validity. Discriminant validity refers to the distinction between different variables (Lattin et al., 2004). When the square root of an AVE is greater than its correlation coefficient with other variables, the discriminative validity is sufficient. From Table 2, it can be seen that the correlation coefficient of each variable is 0.264~0.486, and the AVE square root of each variable is greater than its correlation coefficient with other variables, indicating that there is good discrimination validity among the variables. Overall, the measurement model in this research has good validity.

Table 1 Reliability and Validity Analysis

Variable	Question	Factor loadings (λ)	AVE	CR	Cronbach's α
Built Environment	Many shops, stores, markets, or other places to buy things I need are within easy walking distance of my home.	0.655***	0.509	0.912	0.918
	It is within a 10-15 minutes' walk to a transit stop (such as a bus, train, trolley, or tram) from my home.	0.707***			
	There are sidewalks on most of the streets in my neighborhood.	0.720***			
	There are facilities to bicycle in or near my neighborhood, such as special lanes, separate paths or trails, and shared-use paths for cycles and pedestrians.	0.807***			
	My neighborhood has several free or lower-cost recreation facilities, such as parks, walking trails, bike paths, recreation centers, playgrounds, public swimming pools, etc.	0.775***			
	I see many people being physically active in my neighborhood doing things like walking, jogging, cycling, or playing sports and active games.	0.702***			
	There are many interesting things to look at while walking in my neighborhood.	0.658***			
	The sidewalks in my neighborhood are well maintained (paved, with few cracks) and not obstructed.	0.682***			
	Places for bicycling (such as bike paths) in and around my neighborhood are well maintained and not obstructed	0.667***			
	There are many places to go within easy walking distance of my home.	0.747***			
Exercise Benefits	Exercise can eliminate stress and relax my mind	0.92***	0.779	0.972	0.972
	Sports can be enjoyable	0.908***			
	Exercise can strengthen friendship	0.839***			
	Exercise can maintain a suitable weight	0.927***			

	Exercise can make a good appearance	0.857***			
	Exercise can make you healthy	0.907***			
	Exercise can be done with friends	0.787***			
	Exercise can build up total endurance	0.909***			
	Exercise unable me to challenge myself more	0.914***			
	Exercise makes others recognize their abilities	0.847***			
Physical Perception of Ability	I have excellent reflexes.	0.792***	0.515	0.841	0.868
	My physique is rather strong	0.682***			
	My speed has helped me out of some tight spots.	0.672***			
	I have a strong grip.	0.729***			
	Because of my agility, I have been able to do things that many others could not do.	0.706***			
Physical Ability Perception	I am not agile and graceful	0.701***	0.550	0.859	
	I can't run fast	0.678***			
	I don't feel in control when I take tests involving physical dexterity	0.798***			
	I have poor muscle tone.	0.785***			
	I take little pride in my ability in sports.	0.738***			
Self-efficacy	Physical capacity perception	0.805***	0.596	0.746	
	Physical ability confidence	0.737***			

Note: p<0.001***

Table 2: Discriminant Validity versus Variable Correlation Coefficients

Variable	Built Environment	Self-efficacy	Exercise Benefits
Built Environment	0.714[a]		
Self-efficacy	0.264***	0.772[a]	
Exercise Benefits	0.353***	0.486***	0.883[a]

Note: a indicates that the data is the square root of each variable AVE, and the rest of the data is the correlation coefficient between variables.

5.2.1 Goodness-of-fit Test for Structural Models

The goodness-of-fit test results for the structural model between the latent variables showed that $\chi 2/df=2.334$, GFI=0.938, and CFI=0. 962, IFI= 0.963, NFI = 0.937, TLI = 0.952. All reached greater than 0.9 standard. RMSEA=0.049, less than 0.08. Therefore, the structural model also has good fit.

5.2.2 Hypothesis Testing

The structural equation model is used to test the research hypothesis proposed above, and the results are shown in Table 3. The study assumes that H1 has a standardized path coefficient of 0.211 (t=4.455, p<0.001), and so on. This suggests that the built environment has a significant positive effect on physical activity levels, with h3 having a standardized path coefficient of 0.15 (t=2.832, p=0. 005). This suggests that self-efficacy has a more significant positive effect on physical activity levels, H2. The normalized path coefficient is 0.259 (t=4.). 376, p<0.001), which shows that the built environment has a significant positive impact on self-efficacy. H1, H2, and H3 are all confirmed.

Table 3 Standardization Path Coefficient and Hypothesis Testing

	Estimate	S.E.	C.R.	Significance level	Test results
H1: Built Environment → Physical activity level	0.211	0.094	4.455	<0.001	Establish
H2: Built Environment → Self-efficacy	0.259	0.05	4.376	<0.001	Establish
H3: Self-efficacy → Physical activity level	0.15	0.124	2.832	<0.005	Establish

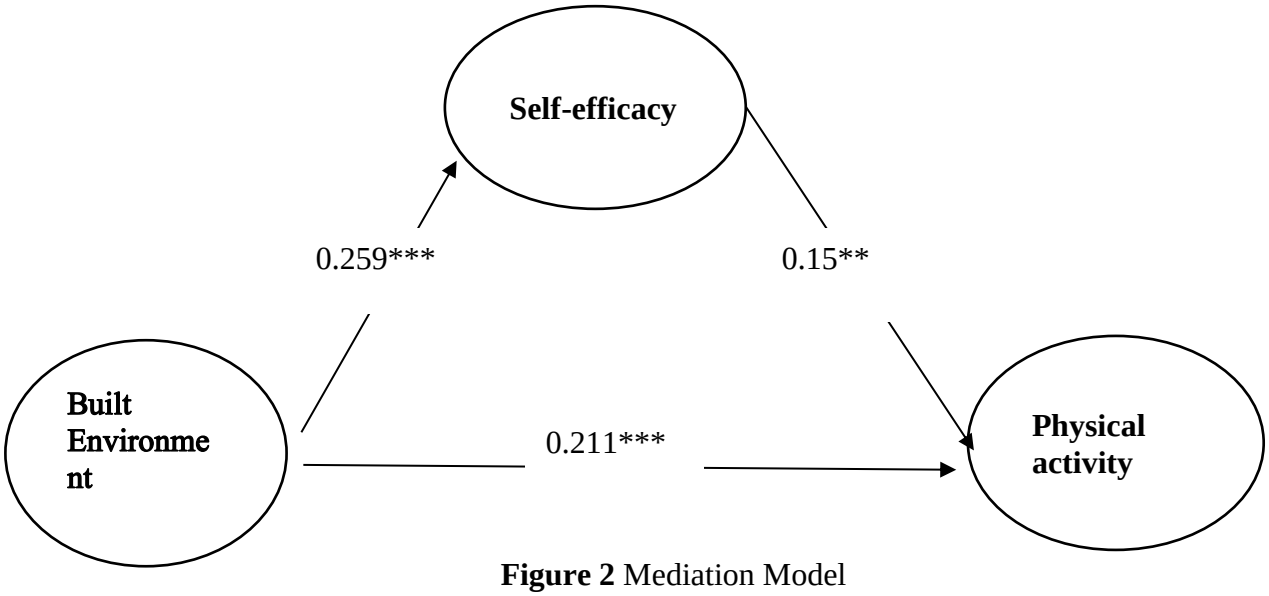

Figure 2 Mediation Model

5.2.3 Mediating Effect Analysis

Using self-efficacy as a mediating variable, the mediating effect of the two on the built environment and the level of physical activity was tested by bootstrap: 5,000 samples were taken, and the total, indirect, and direct effects were calculated, respectively (Hayes, 2013). The results are shown in Table 4, and the built environment has a 95% confidence interval (bias - corrected) for the total effect bias of physical activity (0.318~0. 705) and percentile of 95% of the trust area (0 314~0. 697) does not contain a 0, indicating that the total effect is significantly present, and the intensity of action is 0.494. Indirect effect (bias-corrected) 95% confidence interval (0.024 to 0. 171) and percentile 95% confidence interval (0.017 to 0.155) none of them contains a 0, indicating the existence of a mediating role in self-efficacy. The bias correction 95% confidence interval for direct effects and the percentile 95% confidence interval are 0.234~0.628, 0. 232~0. 626, neither of which contains 0, indicates that the direct effect of the built environment on the level of physical activity also exists, so the mediating effect of self-efficacy is partially mediated. The direct effects of the built environment on physical activity levels (0.417) are greater than the indirect effect (0.077). It can be seen that the built environment of teachers in colleges and universities has an important direct impact on the enhancement of physical activity levels.

Table 4 Mediation Role of Latent Variables in the Structural Model

Variable: Built Environment--Physical activity level	Point Estimate	Product of Coefficients		Bootstrapping			
				Bias-Corrected 95% CI		Percentile 95% CI	
		SE	Z	Lower	Upper	Lower	Upper
Total effect	0.494	0.097	5.093	0.318	0.705	0.314	0.697
Indirect effects	0.077	0.036	2.139	0.024	0.171	0.017	0.155
Direct effects	0.417	0.101	4.129	0.234	0.628	0.232	0.626

Note: Standardized estimating of 5000 bootstrap sample

5.2.4 Regulation Effect Analysis

Hayes (2012) compiled SPSS macroModel5 (Model5 supposes that the direct path of the mediation model is regulated, which is consistent with the theoretical model of this study). The mediation model with the adjustment is being tested. The outcome (Table 4) indicates Exercise benefits be put in the model. The product terms of the built environment and athletic benefits have a significant effect on predicting physical activity levels (Physical activity levels: B=0.040, t = 2.703, p < 0. 01). This shows that exercise benefits can play a moderating role in physical activity levels in the built environment. Further simple slope analysis is shown (Figure 2). Exercise benefits the level is low (M-1SD) of participants. The built environment has a significant positive predictive effect on the level of physical activity, simple slope = 0. 265, t = 3.179, p < 0.005. For participants with high levels of high (M+1SD), the built environment has a more significant positive predictive effect on physical activity(simple slope = 0. 499, t = 5.675, p < 0.001), This

shows that with the increase of the level of knowledge of the benefits of exercise, the predictive effect of the built environment on the level of physical activity is gradually increasing.

Table 5 Regulatory Effect Test

	Self-efficacy				Physical activity level			
	coeff	se	t	p	coeff	se	t	p
constant	4.349	0.047	92.162	0	2.537	0.338	7.499	0
Built evironment	0.127	0.041	3.086**	0.002	0.384	0.073	5.261	0
Self-efficacy					0.295	0.076	3.884	0
Exercise benefits					0.216	0.084	2.567*	0.011
*Built environment*x *exercise benefits,*					0.107	0.04	2.703**	0.007
R-sq	0.017				0.122			
F	9.523**				19.102**			

Note: P<0.05 *; p<0.01**

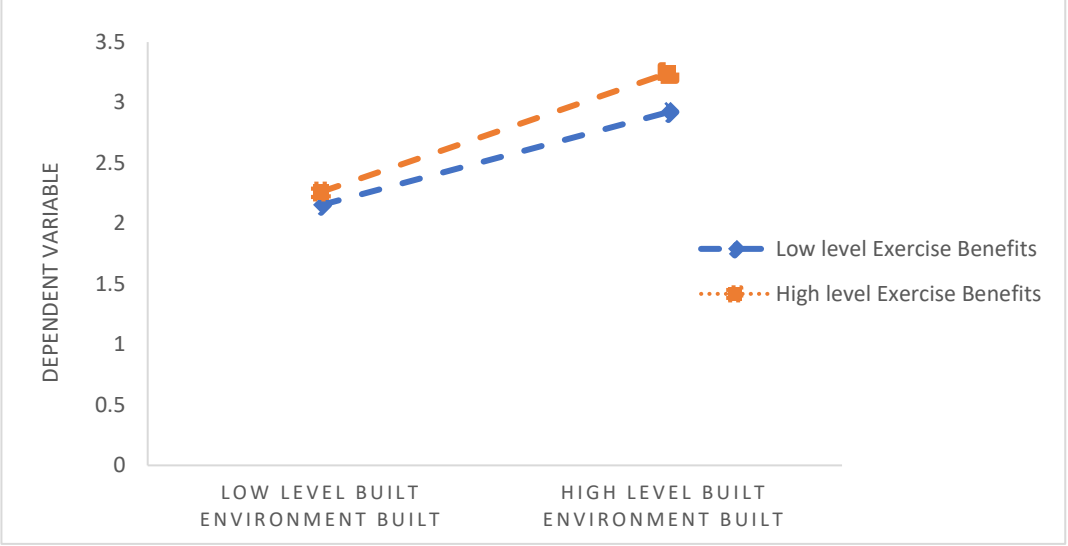

Figure 3 The Regulatory Role of Exercise Benefits in the Relationship between the Built Environment and Physical Activity

6. Conclusion and Discussion

6.1 Relationship between the Built Environment and Physical Activity level of University Teachers

The analysis found that the built environment had a significant positive impact on the physical activity level of college teachers. The result is different from Dong et al. (2017), Pliakasa et al. (2017) and Tudor-Locke et al. (2012) conclusions are unanimous (Dong & Qin, 2017; Pliakasa et al., 2017; Tudor-Locke et al., 2012). In addition, Sallis explored the pattern of influence of the mass-built environment on the level of physical activity and found that the built environment has a positive and significant effect on the level of physical activity (Sallis et al., 2012). In analyzing a review of studies on physical activity in the built environment, Sallis pointed out that the built environment has a positive effect on physical activity levels. In this paper, the research hypothesis is verified by university teachers as research objects, indicating that the hypothesis has good Reliability and stability in different groups. meanwhile, it also shows that the built environment has important positive significance for the physical activities of college teachers, which can not only relieve mental stress and improve self-confidence but also enhance the self-efficacy of physical activities and reduce work pressure. Therefore, in the construction of the community, sports facilities should be allocated as much as possible, the road patency should be maintained, and colleges and universities should also improve the physical activity level of college teachers by improving the accessibility of campus streets.

6.2 The mediating effect of exercising self-efficacy on the physical activity level of teachers

construction environment

In this paper, the hypothesis of self-efficacy as a mediating variable between the built environment and the physical activity level of college teachers is verified, and the analysis shows that the built environment has a significant positive effect on self-efficacy. Self-efficacy also has a significant positive effect on physical activity levels; as in previous studies, this paper found that self-efficacy has a significant and direct effect on physical activity levels (Rhodes et al., 2020; Saelens et al., 2012; Sreeramareddy et al., 2012). Under normal circumstances, college teachers have a higher level of social status and economic income and have good confidence in their athletic ability, so the level of physical activity has a direct impact.

4.3 The benefits of exercise have a regulatory effect on the relationship between the built environment and the physical activity level of teachers in colleges and universities

This paper verified that the benefits of exercise have a regulatory effect on the relationship between the built environment and the physical activity level of university teachers, which is consistent with previous studies (Débora Pacheco et al., 2019; Vaughn, 2009). Specifically, as the level of benefits of exercise increases, the impact of the built environment on the physical activity of college teachers is on the rise. This illustrates the effect of exercise benefits on physical activity levels, supporting the cognitive theory of exercise (Joseph et al., 2019). Therefore, because of the focus on the improvement of the cognitive level of college teachers, through the opening of lectures, salons, etc., to improve the cognitive level of sports benefits, to guide the pride of colleges and universities is to improve the level of physical activity.

In summary, this study indicated that Built Environment can be a protective factor in Physical Activity levels. Furthermore, the mediation analysis showed that self-efficacy can be one possible mechanism underlying this relation. Moreover, benefits can be a predictor of Physical Activity level, and moderated reveals that the benefits the relationship between Built Environment and Physical Activity level. This conclusion helps to fully reveal the process and mechanism of the influence of the built environment on the physical activity level of college teachers as well as guides college teachers to improve their physical activity level, such as improving self-confidence, mastering the knowledge of the benefits of exercise, improving self-efficacy and exercise cognition, and thus improving the level of physical activity.

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8. References

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