

Occupational future time perspective and associated factors among older workers in urban communities of Bangkok, Thailand: A cross-sectional study

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ABSTRACT

Thailand has become a completely aged society in 2024, with a growing proportion of older adults remaining in the workforce. However, evidence on occupational future time perspective (OFTP), which shapes motivation, work engagement, and retirement decisions, remains limited. This study examined OFTP and its subdimensions: Focus on Opportunities (FO); Perceived Remaining Time (RT); and Focus on Limitations (FL), and associated factors among older workers in urban Bangkok. A cross-sectional survey was conducted among 746 adults aged ≥ 50 years in 15 urban communities between January and July 2025. OFTP was measured using the validated Thai OFTP Scale (10 items, Cronbach's $\alpha=0.88$). Descriptive statistics, bivariate analysis, and multiple linear regression were applied. Participants' median age was 59 years; 54.0% were female. The mean OFTP score was 3.10 ± 0.65 . Younger age, better perceived health, and absence of chronic disease were positively associated with OFTP. District-level variation was observed, with Pathum Wan residents reporting lower OFTP. Findings suggest that OFTP among older urban workers is shaped by personal, health, and socioeconomic factors. Policies enhancing healthcare access and supportive urban environments are crucial for sustaining productive employment in later life.

Keywords:

occupational future time perspective, population health, older worker, aged society, urban population

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INTRODUCTION

Global population aging, driven by increased life expectancy and declining birth rates, is reshaping labor markets worldwide.¹ As a result, the proportion of older adults in the labor force is steadily increasing, contributing to new challenges for social and economic policy. Population aging reduces per-capita GDP growth, largely due to slower growth in labor force participation and productivity, thereby underscoring the potential economic benefits of delayed retirement.^{2,3}

Thailand has become a completely aged society in 2024, with adults aged 60 years and over exceeding 20% of the population. Approximately one-third of older adults remain in the workforce, often driven by financial necessity.⁴ At the same time, the old-age dependency ratio (OADR) has nearly doubled since 2000, while the proportion of working-age individuals has declined since 2019. These demographic shifts are expected to reduce labor supply, constrain productivity, and intensify fiscal burdens through rising pension and healthcare expenditures. National projections further indicate that population ageing may reduce annual GDP growth by roughly 0.4 percentage points between 2030 and 2050.⁵

Beyond macroeconomic arguments, there is a growing evidence base demonstrating that continued occupational participation in later life can confer measurable benefits for physical and mental health for many older adults. Recent evidence suggests that remaining in or returning to paid work is associated with better physical functioning and lower levels of mental issues compared with permanent exit from the labor force, while work that is psychosocially supportive and matched to capacity promotes engagement and well-being.^{6,7} Nonetheless, the health benefits of later-life work are not automatic: they are moderated

by job quality, work demands, health status at entry, and the availability of workplace accommodations and health-promoting interventions for older workers. Policies aiming to extend working lives therefore need to combine incentives to work with investments in health, job redesign, and lifelong learning to ensure that extended employment is both productive and salutary.⁸

Bangkok, the capital city and economic hub of Thailand, presents a unique context for older workers, particularly those living in urban communities. Workers in these areas often experience relatively low wages, rising living expenses, and limited access to welfare programs. Moreover, older adults, especially those aged 50 years and above, face reduced employment opportunities alongside gradual declines in physical and cognitive capacity.⁹ In response, the Thai government has implemented policy frameworks to support older workers, including the 20-Year National Strategy (2018–2037), which emphasizes workforce sustainability and human capital development in this population.¹⁰ Consistent with this national direction, the Bangkok Metropolitan Administration Aging Plan (2023–2027) further promotes employment opportunities in later life through upskilling and reskilling initiatives, active promotion of older workforce participation, and financial support programs after retirement.¹¹

Occupational future time perspective (OFTP) is defined as an individual's perception of remaining time, opportunities, and limitations in their working life, which generally decreases with advancing age. Previous studies have shown that higher OFTP scores are positively associated with work motivation, job satisfaction, and retirement intentions.¹² Despite its relevance for workforce aging, OFTP has not been studied in Thailand,

leaving a gap in understanding factors that shape older workers' perceptions of their occupational future.

This study aimed to examine OFTP and its subdimensions, including Focus on Opportunities (FO), Perceived Remaining Time (RT), and Focus on Limitations (FL), and their associated factors among older workers in urban Bangkok, Thailand.

METHODS

Study setting and population

This cross-sectional study included all eligible participants aged 50 years and older residing in 15 urban communities in Pathum Wan and Prawet districts, Bangkok, Thailand. The study was conducted under the project "Development and Implementation of an Action Plan and Platform for the Aging Population in Pilot Communities in Bangkok" by the College of Population Studies, Chulalongkorn University, in collaboration with the Bangkok Metropolitan Administration (BMA). This initiative was developed as an extension of the Chulalongkorn University Platform for Ageing Research Innovation (Chula ARI).¹³ Data were collected between January and July 2025 through structured interviews administered by trained community leaders and health volunteers. Participants were required to communicate effectively with interviewers. Individuals who had not worked within seven days prior to data collection or who had incomplete data were excluded. In total, 746 older adults were included in the analysis.

Data collection

The questionnaire comprised two sections: 1) demographic and personal characteristics and 2) Occupational Future Time Perspective (OFTP).

The first section included independent variables such as age, district, sex, education level, marital status, and job type (categorized as self-employed or

employee). Body mass index (BMI) was categorized according to Asian criteria. Underlying diseases included hypertension, diabetes, dyslipidemia, chronic respiratory diseases, cardiovascular diseases, and cancer. Perceived health status was assessed using a self-rated scale. Ability in activities of daily living (ADLs) was assessed using the Barthel Index. Quality of life was assessed using a rating scale. Financial stability was self-reported based on income adequacy, and social participation was defined as participation in at least one social activity.

The OFTP section was assessed using the Thai version of the Occupational Future Time Perspective Scale.¹⁴ The scale was translated through forward-backward translation and underwent content validation by three experts in occupational medicine, public health, and population studies. A pilot test among 28 older workers in a similar setting outside Bangkok yielded a Cronbach's alpha of 0.88, indicating good reliability. The instrument consists of 10 items rated on a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree). Three subdimensions are identified: Focus on Opportunities (FO, 3 items), Perceived Remaining Time (RT, 3 items), and Focus on Limitations (FL, 2 items), with two remaining items not assigned to any specific subdimension.¹⁵ Composite scores were calculated for OFTP and each subdimension. No predefined cut-off values or categorical scoring criteria were applied. Therefore, scores were analyzed as continuous variables and mean values were compared across population groups. Higher scores reflect a more positive perception of opportunities, remaining time, and limitations in occupational life.

Statistical analysis

Descriptive statistics were presented as the median and interquartile range (IQR) for continuous variables, and as frequencies and percentages for categorical variables. Simple linear regression was

conducted for the bivariate analysis to examine associations between each independent variable and OFTP, as well as its subdimensions (FO, RT, FL). Variables with $P < 0.25$ in the bivariate analysis were included in the multiple linear regression analysis, while factors considered to have low relevance based on the literature review and multivariate results were removed from the model. After checking for multicollinearity using the Variance Inflation Factor (VIF), the multivariate model was finalized. Crude and adjusted beta coefficients (β) and 95% confidence intervals (CIs) were reported. Statistical

significance was defined as $P < 0.05$. Statistical analysis was performed using STATA version 18.0 (Stata Corp., TX, USA).

RESULTS

Of the 1,338 older residents aged 50 years and above from 15 targeted urban communities included in the project database, those who were not working ($n = 565$) and those with incomplete data ($n = 27$) were excluded, resulting in a final sample of 746 participants (**Figure 1**)

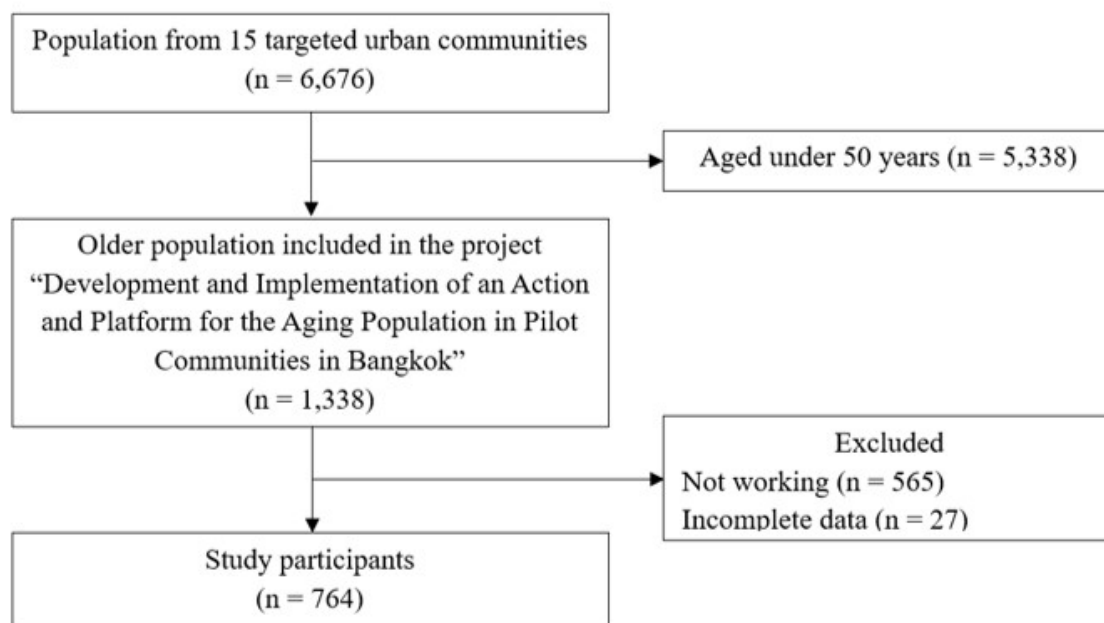


Figure 1. Participant Flow Diagram

Demographic data

The median age of the participants was 59 years (IQR: 55–65), and 54.0% were female. Most participants were married (59.4%), had primary or lower education (63.8%), and were self-employed (85.9%). Nearly all participants rated their health as good (47.1%) or moderate (45.7%), and 92.5% had a full score on the

Barthel Index. However, a majority were overweight or obese (66.1%), and 59.4% of the participants also reported having at least one chronic condition. Regarding socioeconomic conditions, 63.5% had financial stability. Most rated their quality of life as moderate (52.4%) or good (33.4%), and 62.1% reported participating

in at least one community or social activity.

(Table 1)

Table 1 Demographic characteristics (n=746)

Variable (N=746)	Frequency	%
Age, Median (IQR)	59 (55-65)	-
Sex		
Female	403	54.0
Male	343	46.0
Marital status		
Single	303	40.6
Married	443	59.4
District		
Pathum Wan	394	52.8
Prawet	352	47.2
Education level		
Primary	475	63.8
Secondary	198	26.6
University	72	9.7
Job		
Employee	105	14.1
Self-employed	641	85.9
Body mass index (kg/m²)		
Underweight (<18.5)	35	4.7
Normal (18.5–22.9)	217	29.2
Overweight (≥23.0)	492	66.1
Perceived health status		
Poor	54	7.2
Moderate	341	45.7
Good	351	47.1
Activities of daily living		
Normal	690	92.5
Decreased	56	7.5
Underlying disease		
No	303	40.6
Yes	443	59.4
Financial stability		
Unstable	272	36.5
Stable	474	63.5
Quality of life		
Poor	106	14.2
Moderate	391	52.4
Good	249	33.4
Social participation		
No	267	36.0
Yes	475	64.0

Occupational Future Time Perspective (OFTP) and subdimensions

The mean composite OFTP score among older workers was 3.10 ± 0.65 for the three subdimensions, Focus on

Opportunities (FO) had the highest mean (3.20 ± 0.75), followed by Perceived Remaining Time (RT) (3.19 ± 0.75), and Focus on Limitations (FL) (2.83 ± 0.93). (Table 2)

Table 2 Descriptive statistics of OFTP and its subdimensions

Scale	Range	Composite Score, Mean $\pm$ SD	Min	Max	Mean Score $\pm$ SD
OFTP	10–50	30.98 $\pm$ 6.49	10	47	3.10 $\pm$ 0.65
FO	3–15	9.59 $\pm$ 2.26	3	15	3.20 $\pm$ 0.75
RT	3–15	9.57 $\pm$ 2.24	3	15	3.19 $\pm$ 0.75
FL	2–10	5.65 $\pm$ 1.86	2	10	2.83 $\pm$ 0.93

Bivariate analysis and Multivariate analysis

Bivariate analysis (**Table 3**) showed that higher OFTP scores were significantly associated with younger age ($p < 0.001$), being married ($p < 0.001$), residing in urban communities in Prawet district ($p < 0.001$), having a higher level of education ($p < 0.05$), being an employee ($p < 0.05$), having good health ($p < 0.05$), the absence of underlying diseases ($p < 0.05$), and higher quality of life ($p < 0.05$). No significant associations were found between OFTP and sex, BMI, ADLs, financial stability or social participation.

In multivariate analysis, older age (adjusted $\beta = -0.2$; 95% CI: -0.3 to -0.2) was associated with lower OFTP scores and

lower scores across all subdimensions (FO, RT, and FL), whereas residence in Prawet was associated with higher OFTP scores (adjusted $\beta = 2.4$; 95% CI: 1.5 to 3.3). Moderate health status (adjusted $\beta = 2.0$; 95% CI: 0.2 to 3.8) and presence of chronic disease (adjusted $\beta = -1.0$; 95% CI: -1.9 to -0.1) were linked to lower OFTP score and lower FO and RT. Being married (adjusted $\beta = 0.2$; 95% CI: 0.0 to 0.5) was associated with higher FL scores. Social participation was linked to higher FO (adjusted $\beta = 0.3$; 95% CI: 0.0 to 0.7) but lower FL (adjusted $\beta = -0.3$; 95% CI: -0.6 to 0.1). Good quality of life was associated with lower FL scores (adjusted $\beta = -0.5$; 95% CI: -0.9 to -0.1) compared with poor quality of life.

Table 3 Bivariate and multivariate associations of factors with occupational future time perspective (OFTP) and subcategories

Factor	OFTP		FO		RT		FL	
	Crude β	Adjusted $\beta^{\dagger}$	Crude β	Adjusted $\beta^{\ddagger}$	Crude β	Adjusted $\beta^{\S}$	Crude β	Adjusted $\beta^{\P}$
Age	-0.3**	-0.2**	-0.1**	-0.1**	-0.1**	-0.1**	0.0**	0.0*
	(-0.3, -0.2)	(-0.3, -0.2)	(-0.1, -0.1)	(-0.1, -0.1)	(-0.1, -0.1)	(-0.1, 0.0)	(-0.1, 0.0)	(0.0, 0.0)
Sex								
Female	Ref							
Male	0.5		0.2		0.1		0.1	
	(-0.5, 1.4)		(-0.2, 0.5)		(-0.2, 0.4)		(-0.1, 0.4)	
Marital status								
Single	Ref							
Married	1.8**	0.8	0.5*	0.2	0.5*	0.2	0.4*	0.2*
	(0.8, 2.7)	(-0.5, 1.7)	(0.1, 0.8)	(-0.1, 0.5)	(0.1, 0.8)	(-0.1, 0.5)	(0.2, 0.7)	(0.0, 0.5)
District								
Pathum Wan	Ref							
Prawet	3.1**	2.4**	0.7**	0.6*	0.7**	0.5*	1.0**	0.8**
	(2.2, 4.0)	(1.5, 3.3)	(0.4, 1.1)	(0.3, 0.9)	(0.4, 1.0)	(0.2, 0.8)	(0.7, 1.3)	(0.5, 1.1)
Education level								
Primary	Ref							
Secondary	2.2**	0.8	0.6*	0.2	0.6*	0.2	0.5*	0.3
	(1.1, 3.3)	(-0.3, 1.8)	(0.3, 1.0)	(-0.2, 0.5)	(0.3, 1.0)	(-0.2, 0.5)	(0.2, 0.8)	(0.0, 0.6)
University	2.3*	1.0	1.0*	0.5	0.8*	0.4	0.8	0.0
	(0.7, 3.9)	(-0.5, 2.6)	(0.4, 1.5)	(0.0, 1.1)	(0.2, 1.3)	(-0.2, 0.9)	(-0.3, 0.6)	(-0.5, 0.4)
Job type								
Employee	Ref							
Self-employed	-2.2*	-0.7	-0.5*	-0.2	-0.5*	-0.2	-0.6*	-0.2
	(-3.5, -0.8)	(-2.0, 0.6)	(-1.0, -0.1)	(-0.7, 0.3)	(-1.0, -0.1)	(-0.6, 0.3)	(-1.0, -0.3)	(-0.6, 0.2)
Body mass index								
Normal	Ref							

Factor	OFTP		FO		RT		FL	
	Crude β	Adjusted $\beta^{\dagger}$	Crude β	Adjusted $\beta^{\dagger}$	Crude β	Adjusted $\beta^{\S}$	Crude β	Adjusted $\beta^{\P}$
Underweight	0.7 (-1.6, 3.0)		0.1 (-0.7, 0.9)		0.2 (-0.6, 1.0)		0.3 (-0.4, 0.9)	
Overweight	0.6 (-0.4, 1.7)		0.2 (-0.2, 0.5)		0.4 (-0.3, 0.4)		0.2 (-0.1, 0.5)	
Perceived health status								
Poor	Ref							
Moderate	2.9* (1.1, 4.8)	2.0* (0.2, 3.8)	1.3** (0.6, 1.9)	0.8* (0.2, 1.4)	1.2** (0.5, 1.8)	0.7* (0.1, 1.4)	0.1 (-0.4, 0.6)	
Good	2.9* (1.0, 4.7)	1.6 (-0.2, 3.5)	1.2** (0.6, 1.9)	0.6 (-0.1, 1.2)	1.1* (0.5, 1.7)	0.5 (-0.2, 1.2)	0.1 (-0.4, 0.7)	
Activities of daily living								
Normal	Ref							
Decreased	-0.9 (-2.7, 0.8)		-0.3 (-0.9, 0.3)		-0.5 (-1.1, 0.2)		0.0 (-0.6, 0.5)	
Underlying disease								
No	Ref							
Yes	-1.6* (-2.5, -0.6)	-1.0* (-1.9, -0.1)	-0.7** (-1.0, -0.4)	-0.5* (-0.8, -0.2)	-0.7** (-1.0, -0.4)	-0.5* (-0.8, -0.2)	0.0 (-0.3, 0.3)	
Financial stability								
Unstable	Ref							
Stable	0.7 (-0.3, 1.7)		0.3 (0.0, 0.6)		0.1 (-0.2, 0.4)		0.2 (0.0, 0.5)	
Quality of life								
Poor	Ref							
Moderate	2.3* (1.0, 3.7)	0.7 (-0.7, 2.1)	0.9** (0.4, 1.4)	0.4 (-0.1, 0.9)	0.9** (0.4, 1.3)	0.4 (-0.1, 0.9)	0.2 (-0.2, 0.6)	0.0 (-0.4, 0.4)
Good	0.4 (-1.0, 1.9)	-0.5 (-2.0, 0.9)	0.6* (0.1, 1.1)	0.3 (-0.2, 0.9)	0.5* (0.2, 1.0)	0.2 (-0.3, 0.7)	-0.5* (-0.9, -0.1)	-0.5* (-0.9, -0.1)

Factor	OFTP		FO		RT		FL	
	Crude β	Adjusted $\beta^{\dagger}$	Crude β	Adjusted $\beta^{\ddagger}$	Crude β	Adjusted $\beta^{\S}$	Crude β	Adjusted $\beta^{\P}$
Social participation								
No	Ref							
Yes	0.0 (-1.0, 0.9)		0.3 (0.0, 0.7)	0.3* (0.0, 0.7)	0.1 (-0.3, 0.4)		-0.4* (-0.7, -0.1)	-0.3* (-0.6, -0.1)

* $P < 0.05$, ** $P < 0.001$,

† Adjusted for age, marital status, district, education level, job type, perceived health status, underlying disease, and quality of life.

‡ Adjusted for age, marital status, district, education level, job type, perceived health status, underlying disease, quality of life, and social participation.

§ Adjusted for age, marital status, district, education level, job type, perceived health status, underlying disease, and quality of life.

¶ Adjusted for age, district, marital status, education level, job type, quality of life, and social participation.

DISCUSSION

This study's findings indicate that the study population largely represents active aging and highly self-reliant older workers in urban Bangkok, with over 90% achieving a full Barthel Index score, attributable to the exclusion of individuals who were not currently working. Although most participants reported good or moderate perceived health, the high prevalence of overweight and underlying chronic disease suggests that many older workers continue to experience non-disabling health conditions, underscoring the importance of accessible and effective healthcare systems in urban communities. Most participants had primary education or lower and were predominantly self-employed, findings consistent with the 2021 Survey of the Older Population conducted by the National Statistical Office.¹⁶ These patterns reflect the socioeconomic context of the targeted urban communities, where informal and small-scale employment is common among older adults and often associated with limited income security and social protection, highlighting the importance of strengthened financial and social security policies to improve quality of life in later working life.

The mean OFTP score among older workers in selected urban communities in Bangkok, Thailand (3.10) was higher than that reported for workers aged 20–69 in Japan¹⁷ and comparable to scores among workers aged 21–62 in Spain.¹⁸ The mean FO and RT scores (3.20 and 3.19, respectively) were also notably higher than those observed among workers aged 40 and above in the USA, UK, and Germany,¹⁹ as well as in Australia.¹⁵ In contrast, the mean FL score (2.83) was lower than that reported in Japan,¹⁷ Spain,¹⁸ and Australia.¹⁵ In this community-based urban sample, older workers may perceive greater work

opportunities and remaining time in their working lives. These perceptions are likely shaped by economic necessity, as lower income levels, insufficient savings, and limited pension coverage and social protection programs in Thailand may create stronger motivations to continue working compared with workers in high-income countries with more comprehensive welfare systems. Nevertheless, the relatively low FL score indicates that perceived limitations persist and may be related to health constraints, mismatches between physical capacity, skills, and job demands in later life, financial insecurity, and restricted access to age-appropriate employment. These findings underscore the need for strengthened social and labor policies to support sustained and meaningful work participation among Thailand's aging population.²⁰

Age was negatively associated with OFTP and all three subdimensions, aligning with Socioemotional Selectivity Theory, which posits that individuals perceive remaining lifetime and work-related time as increasingly limited with age.²¹ This finding is also consistent with longitudinal evidence from German workers showing declines in FO and RT as age increases.²² Additionally, marital status was associated with higher FL scores, contrasting with findings among older Japanese workers, possibly because married individuals often bear greater family and financial responsibilities, shaping perceptions of work-related limitations.

Older workers residing in Prawet district demonstrated higher overall OFTP and subdimension scores (FO, RT, and FL) compared with those living in Pathum Wan district. Participants in Prawet district had a higher percentage of high school and university graduates, accompanied by a higher proportion of workers in regular employment. In addition, a greater proportion of participants in Prawet district

reported financial stability, and fewer reported poor quality of life. These individual and socioeconomic differences may partly explain the more positive occupational future perceptions observed in Prawet district. Moreover, the contrasting community characteristics may also play an important role; Pathum Wan district represents a densely populated inner-city area, whereas Prawet district is a suburban expansion area with less congestion and potentially more favorable living and working conditions. Such differences in neighborhood environments are likely to influence older workers' occupational outlooks. Research indicates that the characteristics of neighborhood and community environments significantly affect older workers' occupational perceptions and engagement. For instance, a systematic review found that factors such as neighborhood safety, access to transportation and amenities, and supportive land use contribute to older adults' social well-being and sense of inclusion, which can translate into greater occupational optimism and perceived opportunities.²³

Perceived health emerged as a key determinant of OFTP. Older workers who rated their health as moderate or good had significantly higher OFTP, FO, and RT scores compared with those reporting poor health, consistent with findings among employees in Japan¹⁷ and Germany.¹⁴ This suggests that positive health perception enhances optimism about future work opportunities and remaining working time. Conversely, the presence of underlying disease may heighten awareness of physical constraints, contributing to lower OFTP, particularly in FO and RT dimensions.

Older adults reporting a high quality of life had lower FL scores compared with those with poor quality of life, possibly reflecting greater financial security and reduced perceived need to continue working after retirement.²⁴ In addition, social participation was associated with

higher FO but lower FL scores. This pattern may indicate that engagement in community activities is associated with greater perceived opportunities, while higher perceived work limitations may allow more time and flexibility for social participation.²⁵

This study offers several notable strengths. First, it utilized secondary data from a large-scale project in which trained local volunteers conducted data collection, enabling the inclusion of a substantial and diverse sample across 15 urban communities in two Bangkok districts and enhancing the representativeness of the study sample of older urban workers. Second, the OFTP assessment tool underwent rigorous forward-backward translation, expert content validation, and pilot testing, ensuring measurement accuracy and reliability. Finally, the study examined a broad range of individual, health, and socioeconomic factors and applied multivariable analysis to control for confounding, thereby strengthening the validity and robustness of the observed associations.

CONCLUSION

This study shows that occupational future time perspective among older urban workers in Bangkok is shaped by personal, health, and socioeconomic factors. Younger age, better perceived health, and absence of chronic conditions were linked to more positive perceptions of future work opportunities and remaining work time. District-level differences underscore the role of community environments in shaping occupational outlook. These findings highlight the need for integrated policies that enhance healthcare access and supportive urban environments to enable older adults to remain in the workforce longer and more productively, strengthening Thailand's resilience in an era of rapid population aging.

LIMITATIONS

Nevertheless, some limitations should be acknowledged. First, the analytical cross-sectional design precludes causal inference between associated factors and OFTP. Second, the reliance on self-reported data may have introduced recall and social desirability bias. Third, the exclusion of individuals who were not currently employed may have resulted in a healthy worker effect, potentially leading to an overestimation of OFTP levels. Finally, the study sample may not fully represent Thailand's aging workforce, as wealthier older adults residing in private homes or condominiums in Bangkok, as well as older workers in rural, agricultural, or factory-based settings, were not included. These limitations may restrict the generalizability of the findings to other populations and contexts within the country.

RECOMMENDATIONS

Future research should employ longitudinal designs to capture changes in OFTP and its subdimensions over time and examine a broader range of potential determinants, including mental health, stress, burnout, job characteristics, workload, compensation, job security, and workplace benefits.²⁶ Social and family factors, such as government support, community resources, social relationships, caregiving responsibilities, and family structure, also warrant investigation, as they may influence perceptions of OFTP. In addition, technology-based health interventions, such as mobile health (mHealth) platforms for lifestyle modification, should be explored. Evidence from a qualitative study among health check-up clients in a tertiary hospital in Pathum Wan district, predominantly older adults, indicates that mobile health (mHealth) interventions can improve health behaviors, perceived

usefulness, and self-efficacy, which may indirectly support older workers' ability to remain in employment.²⁷ Studies should also examine outcomes linked to OFTP, such as retirement intentions and work motivation, to deepen understanding of its role in shaping work-related behaviors. Finally, research in diverse contexts, including industrial and agricultural workers in rural settings, is needed to improve generalizability and strengthen evidence for labor and social policy planning.²⁸

AUTHOR CONTRIBUTIONS

NK: Conceptualization, Methodology, Formal analysis, Writing – original draft, and Writing – review & editing. OP: Resources, Methodology, Data curation, and Writing – review & editing. JR: Conceptualization, Supervision, Methodology, Formal analysis, Writing – original draft and Writing – review & editing.

ETHICAL CONSIDERATION

The study protocol was approved by the Institutional Review Board (IRB) of the Faculty of Medicine, Chulalongkorn University (Med Chula IRB No. 0208/68) on 30 April 2024 and was conducted in accordance with the Declaration of Helsinki (1975). All data were de-identified, and the study posed minimal risk to participants.

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CONFLICT OF INTEREST

The authors declare no conflict of interest in this study.

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