

Short Research Article

Investigating tobacco hazard prevention in southern Taiwan

ABSTRACT

Introduction: Statistics revealed that the percentage of convenience stores, supermarkets, betel nut stalls, and grocery shops that illegally sold tobacco products to minors is high in Taiwan. It is critical to prevent tobacco hazards to minors. The aim of this study was to investigate tobacco hazard prevention among retailers in southern Taiwan.

Methodology: A cross-sectional design was used in this study. The survey testers were university students older than 18 years and attired in senior high school uniforms to disguise themselves as senior high school students. They were assigned to test whether tobacco retailers confirmed customers' ages before selling tobacco products. The survey investigations were conducted from March 2015 to August 2015.

Results: The investigation covered 327 retailers, comprising 70 convenience stores, 146 grocery shops, and 111 betel nut stalls. The results revealed that among the 327 retailers, 239 (73.1%) failed to confirm that the buyer was at least 18 years of age before allowing the purchase. Age confirmation before tobacco sale was less frequent in urban areas compared with coastal regions and mountain regions ($F = 8.372, P < .01$).

Conclusion:

This study proposes establishing self-management strategies for compliant and noncompliant retailers to prevent illegal sale of tobacco products to minors.

Keywords: Tobacco hazards, disease prevention, teenage, smoke free, health promotion.

1. INTRODUCTION

Tobacco hazards have caused the death of one hundred million people worldwide in the twentieth century. However, the Tobacco Hazard Report by the World Health Organization (2008) indicated that only 5% of the world's population was covered by comprehensive smoke-free laws (WHO, 2008). The WHO Report on the Global Tobacco Epidemic published in February 2008 urged nations worldwide to take active measures in tobacco hazard prevention to prevent the loss of one billion people in the twenty-first century (WHO, 2008). According to Taiwanese research results, over eighteen thousand people have died each year because of smoking-related diseases, and the annual medical costs of treating such diseases have exceeded NT\$16.5 billion, incurring a total economic loss of over NT\$50 billion (Department of Health and Executive Yuan, 2007).

Article 13 of the Tobacco Hazards Prevention Act stipulates that no person shall provide

21 tobacco products to persons under the age of 18. According to the 2014 Global Youth
 22 Tobacco Survey, 45.7% of junior high school smokers were able to purchase cigarettes
 23 directly and 52.8% were not stopped from purchasing cigarettes indirectly; moreover, 75.8%
 24 of senior high school smokers were able to purchase cigarettes directly and 67.9% were not
 25 stopped from purchasing cigarettes indirectly (Ministry of Health and Welfare, 2014). The
 26 Chinese Taipei Consumers' Foundation conducted on-site inspections of 660 tobacco product
 27 retailers in 22 counties and cities in 2013 to assess cigarette sale to minors. Statistics revealed
 28 that the percentage of convenience stores, supermarkets, betel nut stalls, and grocery shops
 29 that illegally sold tobacco products to minors was 52.6%, among which the violation
 30 percentage by convenience stores was 38.8% and that by grocery shops and betel nut stalls
 31 was 59.3% and 69.1%, respectively (Ministry of Health and Welfare, 2013), indicating a
 32 severe problem of illegal tobacco sale to minors.

33 Tobacco hazard prevention policies, diverse pamphlet promotions, and health education
 34 promotions have been effective in reducing the smoking rates of the youth population
 35 (Willemsen & De Zwart, 1999). The Health Promotion Administration, Ministry of Health
 36 and Welfare of Taiwan (2014) has applied multimedia teaching materials in the “Stop,
 37 Observe, and Listen” Manual to remind tobacco product retailers of regulations prohibiting
 38 the sale of cigarettes to minors. Stop refers to “Stopping the illegal sale of tobacco products
 39 to minors under the age of 18.” Observe refers to “Observing that the customer may be under
 40 the age of 18. If in doubt, retailers should request identification.” Listen refers to the fact that
 41 “Retailers should inform customers of the regulations and advise customers to abide by
 42 them.” The Manual and supporting pamphlets were designed to promote the tobacco hazard
 43 prevention policy, “No person shall provide tobacco products to persons under the age of
 44 eighteen,” and reduce the number of retailers violating the regulations on sale of tobacco
 45 products to minors. This study aimed to investigate tobacco hazard prevention among

retailers in the counties and cities of southern Taiwan.

2. METHODOLOGY

A cross-sectional design was applied in this study. The survey testers were university students older than 18 years and were attired in senior high school uniforms to disguise themselves as senior high school students. They were assigned to purchase tobacco products from tobacco retailers in the counties and cities of southern Taiwan. The testers assessed whether the retailers took the initiative to confirm customers' ages before selling tobacco products. The survey investigations were conducted from March to August 2015. Descriptive statistics and statistical inference were used in this study. The significance level was set at 0.5. All analyses were performed using SPSS software (version 18).

3. RESULTS

The investigation covered 327 retailers, comprising 70 convenience stores, 146 grocery shops, and 111 betel nut stalls. The results indicated that among the 327 retailers, 239 (73.1%) retailers failed to confirm that the buyer was at least 18 years of age before allowing purchase. The convenience stores, betel nut stalls, and grocery shops that failed to confirm that the customer was at least 18 years of age before allowing purchase of tobacco products significantly differed ($P < 0.001$) (Table 1), with grocery shops having the highest rate of failing to confirm customers' ages before tobacco sale (27.2%) (Table 1). The results of a comparison among retailers in mountain regions, coastal regions, and urban areas indicated that retailers in the urban areas were the least likely to confirm customers' age before tobacco sale ($F = 8.372$, $P < .01$) (Table 2).

Table 1 Failing to confirm customers' ages before tobacco sale (N=327)

Retailers	failing to confirm customers' ages before tobacco sale		<i>p</i>
	Yes	No	
Convenience stores	74(22.6%)	24(7.3%)	0.001***
Betel nut stalls	76(23.2%)	38(11.6%)	
Grocery shops	89(27.2%)	26(8.1%)	

* $P < .05$; ** $P < .01$; *** $P < .001$

72 Table 2 Confirm customers' age before tobacco sale (N=327)

Regions	Confirm customers' age before tobacco sale	N (%)	F	P	Scheffe
Mountain regions	Yes	71(21.7%)	8.372	0.004**	urban areas > mountain regions, coastal regions
	No	14(4.3%)			
Coastal regions	Yes	74(22.6%)			
	No	28(8.6%)			
Urban areas	Yes	94(28.7%)			
	No	46(14.1%)			

73 * $P < .05$; ** $P < .01$; *** $P < .001$

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75 Significant differences were observed in the number of displayed posters that warned
 76 against illegal sale of tobacco products to minors among retailers in the mountain regions,
 77 coastal regions, and urban areas ($P < .01$). Among the 327 retailers, 296 (87.1%) abided by
 78 government regulations in displaying posters warning against illegal sale of tobacco products
 79 to minors. The retailers in the mountain regions showed the highest compliance with the law
 80 regarding displaying warning posters (38.8%) (Table 3). The convenience stores, betel nut
 81 stalls, and grocery shops that complied with regulations significantly differed in the rate of
 82 displaying warning posters ($P < .01$) (Table 4), with the convenience stores showing the
 83 highest compliance (30.0%) and grocery shops showing the least compliance (10.1%).

84 Table 3 Displaying posters warning against illegal sale of tobacco products to minors (N=327)

	Displaying posters warning against illegal sale of tobacco products to minors		p
	Yes	No	
Mountain regions	127(38.8%)	4(1.2%)	0.006**
Coastal regions	80(24.5%)	18(5.5%)	
Urban areas	89(27.2%)	9(2.8%)	

85 * $P < .05$; ** $P < .01$; *** $P < .001$

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87 Table 4 Complied with regulations to display warning posters (N=327)

Retailers	Complied with regulations to display warning posters		p
	Yes	No	
Convenience stores	98(30.0%)	0(0%)	0.01**
Betel nut stalls	95(29.1%)	9(2.8%)	
Grocery shops	92(28.0 %)	33(10.1%)	

88 * $P < .05$; ** $P < .01$; *** $P < .001$

89 **4. DISCUSSION**

90 The study results indicated that the number of stores that sold tobacco products to
 91 students in uniform without age confirmation in counties and cities in southern Taiwan (73%)
 92 was higher than those in the counties and cities in eastern Taiwan (44 of 118 retailers, 37.3%;
 93 Public Health Bureau, 2014) and northern Taiwan (36 of 120, 30.0%; Chi, 2014). The
 94 investigation results revealed that grocery shops demonstrated the highest rate of failing to
 95 confirm customers' ages before tobacco sale and the least compliance in displaying posters
 96 warning against illegal sale of tobacco products to minors. This study proposes increasing the
 97 frequency of inspections by tobacco product retailers and placing the retailers that illegally
 98 sell tobacco products to minors under supervision and guidance. Self-management strategies
 99 should be established and incentive measures should be instituted for compliant retailers. For
 100 noncompliant retailers under supervision, heavier penalties should be exacted. Tobacco
 101 hazard counseling services should also be established, supervised, and managed by counties
 102 and cities, and should include an informant hotline and public feedback webpage.

103 Antismoking multimedia pamphlets and advertisements are effective in the preventing
 104 tobacco sale to minors and reducing smoking (Perez, et al., 2012; Schillo, et al., 2011).
 105 Efforts to develop a healthy, smoke-free environment can also be increased by displaying
 106 antismoking signs and creating smoke-free campuses and smoke-free communities.
 107 Community administrative departments and retailers should cooperate in promoting
 108 antismoking campaigns and form a "caring store network" to prevent tobacco sale to minors.

109 **5. CONCLUSION**

110 This study proposes establishing self-management strategies for compliant and
 111 noncompliant retailers to prevent illegal sale of tobacco products to minors. The findings of
 112 the study indicate that smoke-free multimedia pamphlets and advertisements are effective in
 113 tobacco hazard prevention. Furthermore, antismoking campaigns, community resource use,
 114 and training of volunteers, such as parents, students, and community retailers, in tobacco

hazard prevention education should be organized to form a smoke-free home and community environment.

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