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Prevalence and Health Consequences of Smoking among Pacific Islanders: A Systematic Review Study

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Abstract

Introduction: Smoking remains to be a main cause of preventable death and illness in both developing and developed countries. The high prevalence of smoking consumption contributes to significant health-related diseases. While the rate of smoking use is reducing in most countries, Pacific countries still have a high smoking prevalence. This systematic review study is aimed at understanding the prevalence of smoking and its health consequences among Pacific countries.

Methods: This systematic review study utilized five databases including Medline, Embase, Web of Science, PsychInfo, and Scopus to find relevant studies. Cochrane library guideline was used to process the search and appraise the quality of the articles. Articles that were published in English, from 1st January 2000 to 1st August 2016, were included in the search using keywords such as Pacific, Smoking, Tobacco, cigar, and risk factors and consequence. The titles, abstracts, and full texts of all relevant articles were reviewed by two coders and a data extraction sheet including studies characteristics, participants, and methodological information was made. A descriptive statistical analysis was applied to measure the frequency and health consequences of smoking among Pacific countries.

Results: Twenty-four studies were reviewed. Most of the studies were conducted in South Pacific countries (37.5%) using descriptive methodology. Most of the studies focused on community (37.5%) as the target group. There was a range of 3%-75% in smoking prevalence in different populations. While the highest prevalence of smoking consumption in community based studies was reported among men in Kiribati, the highest prevalence in hospital based studies was 40% among Pacific males in New Zealand and the lowest was among pregnant women in the western Pacific Region. Smoking has been recognized as the most common risk factor of hemorrhagic stroke (25%), more than any other disease and condition among Pacific people.

Conclusion: The results of this study highlighted different ranges of smoking prevalence among different population groups in Pacific countries. Health consequences of smoking were different and based on different populations. Policy change, along with a comprehensive preventive approach using community norms, needs to be considered to prevent smoking among Pacific Islanders.

Keywords: Smoking; Risk factors; Pacific; Health Consequence

Introduction

Over the years, tobacco use has continued to plague the health of populations worldwide. Global statistics have shown that tobacco use is responsible for approximately 60 million deaths each year and is more prevalent in low-middle income countries [1]. In the United States, smoking remains the leading cause of preventable death among all racial groups [2]. Studies have shown that East Asia, South East Asia, and Eastern Europe have the highest prevalence of smoking among men, while Europe has the highest prevalence of smoking among women [3]. Smoking is found to be more prevalent among ages 30–34 in developed countries and ages 45–49 in developing countries, but is rapidly increasing among ages 15-24 [4].

Tobacco is a widely known risk factor for cancer and other diseases in a number of organs [3]. Smoking can lead to detrimental effects on the health and well-being of those who smoke. It harms nearly every organ and system in the body and has been linked to many types of cancer including lung cancer, and other diseases such as heart disease, heart attacks, stroke, blindness, impotence, and respiratory diseases such as emphysema and chronic bronchitis [5].

The smoking epidemic persists in the Pacific Island countries where it is one of the main risk factors for diseases and is a major threat to the Pacific's collective vision of healthy islands [1]. In the past two decades, the Pacific Island countries, along with other low middle income countries (LMICs), have seen a rapid increase in overall tobacco consumption [6]. The prevalence of smoking in the Pacific ranges from 5%-75% [1,7]. The prevalence of smoking is different based on ages and genders in Pacific. It is more common among adult males than females (26.2% *vs.* 20.5%) while youth males and females have a lower prevalence (13.6% and 10.3%, respectively) [8]. The prevalence of smoking is also different in different Pacific countries based on genders. For example, the Cook Islands have the highest smoking rates in both males and females (18.3% *vs.* 16.8%, respectively) while Fijian males and females have a lower prevalence rate of smoking (8.6% *vs.* 6.5%, respectively) [1,8]. It is important to note that the Pacific Islands are in the midst of a Non-Communicable Disease (NCD) crisis, of which smoking has been identified as a contributing factor [1].

There is a need for more studies to be conducted in the Pacific to determine the prevalence and health consequences of smoking among Pacific people so that control measures can be implemented to prevent the burden of smoking within these small island populations. As there are not any systematic review studies, this study is aimed to understand the prevalence and health consequences of smoking among Pacific islanders.

Methodology

A systematic review study was conducted to understand the prevalence and health consequences of smoking among Pacific Islanders. Five databases were used to search studies including; Medline, Embase, Web of Science, PsychInfo, and Scopus. These databases were chosen based on similar previous systematic review studies. Different key terms were used to find relevant studies including; "Pacific", "Smoking", "Tobacco", "Cigar", "risk factors", and consequences. The conjunctions "AND" and "OR" were used to combine different key terms to find the articles narratively.

Studies with different quantitative research methodologies such as cross-sectional study, cohort study, randomized controlled trials (RCTs), quasi randomized trials (QRCs) and also qualitative study were included in this study. All studies published from 1st January 2000 to 1st August 2016 and in the English language were included in this study while those not in the English language, or if their full text was not available, have been excluded. This time period was chosen in order to include recently published studies and also new insights on the health consequences of smoking on different populations.

To access the relevant studies, the Cochrane Library Guideline was used and three stages were implemented to obtain the appropriate research. Two coders separately reviewed articles in each stage to reduce bias. At the first stage, the titles of all searched articles were scanned and reviewed and many articles were omitted because they were not relevant. At the second stage, the abstract of the remaining articles were reviewed and those not relevant or having some methodological issues were omitted. At the third stage, the full texts of the remaining articles were reviewed and some articles were omitted. Overall, 21 studies met the study inclusion and exclusion criteria. The search process is shown in Figure 1.

The bibliographies of the final articles were re-searched and some new articles, which were not accessible in the databases, were considered in the study. Finally, three studies were added based on the bibliography search and 24 studies were analyzed.

The data extraction sheet was made (Table 1) and the needed information related to the study, participants, methodology, and results for each study were included in it. A descriptive analysis was applied to measure the frequency and also health consequences of smoking among Pacific Islanders.

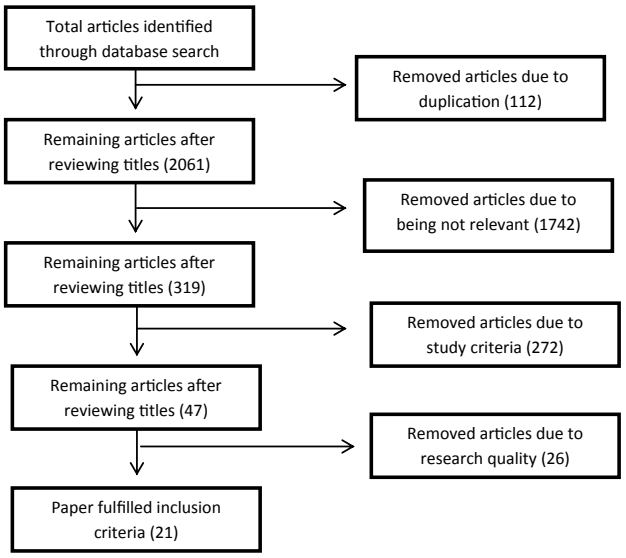

Figure 1: The process to achieve relevant articles; Risk Evaluation classification.

N	Article/Study	Participants	Methodology	Results
1	Romero and Pulvers [2] Year: 2013 Type: Cross-sectional Country: USA	Number: 490 Male: Not Specified Female: 70% Age: Mean age- 21 years	Place: School Based (University) Sampling Method: purposive sampling Data Collection: Survey	Prevalence 19% of participants were smokers. Current smoking by race was 26% PI, 19% AA, and 17% Caucasian.
2	Arliss RM [27] Year: 2006 Type: Cross-sectional Country: USA	Number: 466 Male: Out of 138 Asians 43% were male, out of 328 non-Asians 46% were male Female: Out of 138 Asians 57% were female, out of 328 non-Asians 54% were female Age: 18-35 years	Place: School Based (Community College) Sampling Method: Unknown Data Collection: Questionnaire Survey	Prevalence Out of 138 AAPI participants- 20.3% were smokers, 7.7% 11 or more cigarettes per day.
3	Nosa et al. [21] Year: 2014 Type: Cross-sectional Survey Country: New Zealand	Number: 2,208 Male: Female: Age: 10-13 Years	Place: School-Based Sampling Method: Purposive sampling Data Collection Tool: Questionnaire	Prevalence The prevalence of Pacific ever-smokers (for 2007) in Year 7 was 15.0% (95% Confidence Interval [CI] 12.0%–18.3%) and Year 8, 23.0% (95% CI 19.5%–26.7%).
4	Butler et al. [28] Year: 2004 Type: Cohort Country: New Zealand	Number: 1398 Male: Female: Age: Infants 6 weeks and older	Place: Hospital based Sampling Method: Purposive Data Collection Tool: Questionnaire, Interview	Prevalence Out of 1398 mothers 31% are smokers
5	Chen et al. [29] Year: 2004 Type: Cross-sectional Survey Country: Marshall Islands	Number: 3,294 Male: 1,558 Female: 1,700 36 non-respondents for gender Age: 9-20, mean age 14	Place: School based Sampling Method: Stratified Sampling Data Collection Tool: Survey Questionnaire	Prevalence The rate of smoking among 18 year olds was 33.5%.
6	Wu et al. [22] Year: 2013 Type: Cohort Country: USA	Number: 355,498 Male: Unknown Female: Unknown Age: ≥ 12 Years old	Place: Community Sampling Method: Multistage area probability sampling Data Collection: Survey Questionnaire	Prevalence The prevalence of smoking among Native Hawaiians/Pacific islanders was 26.7% in 2010
7	Caleyachetty et al. [7] Year: 2014 Type: Cross-sectional Country: LMICs- African Region, Southeast Asian Region, Western Pacific Region, European Region	Number: 58,922 pregnant women Male: Female: All Female Age: Range 15–49	Place: Hospital Based Sampling Method: Purposive Sampling Data Collection: Survey Questionnaire	Prevalence Current tobacco smoking in pregnant women ranged from 0·6% (0·3–0·8) in the African region to 3·5% (1·5–12·1) in the Western Pacific region.

8	Tautolo et al. [5] Year: 2011 Type: Cohort Country: New Zealand	Number: 1,477 mothers Male: Female: 1,477 Age: Not specified	Place: Hospital Based Sampling Method: Random Sampling Data collection: Interview	Prevalence Increase in mothers' smoking prevalence over time was noted *(p* = 0.002*)*. Significantly, for about 25% of Pacific children both their parents were current smokers.
9	Wong et al. [30] Year: 2003 Type: Cross-sectional Country: USA	Number: 288,831 Male: Not specified Female: Not specified Age: Not specified	Place: School Based Sampling Method: Stratified sampling Data collection: Survey questionnaire	Prevalence PI & NH-Lifetime Tobacco use 9th Graders PI-51.8% 10th Graders NH- 64.2%
10	Tara Kessaram et al. [10] Year: 2015 Type: Quantitative Country: Pacific Island Countries and Territories	Number: Male: Not specified Female: Not specified Age: Adults (25-64 years) Youths (13-15 years)	Place: Community based and School based Sampling Method: Purposive Sampling Data collection: Survey	Prevalence Adult smoking prevalence ranged from less than 5% of women in Vanuatu to almost 75% of men in Kiribati. Highest prevalence for women-59.3% Tokelau Smoking prevalence among students (13-15 years) ranged between 5.6% and 52.1%.
11	Smith et al. [31] Year: 2006 Type: Cross-sectional survey Country: Tonga, Pohnpei, FSM and Vanuatu	Number: 8,777 school students Male: Not specified Female: Not specified Age: 11-17	Place: School Based Sampling Method: Cluster Random Sampling Data collection: Survey questionnaire	Prevalence Among 15-year-olds, boys in Tonga reported the highest prevalence of weekly smoking (29%), followed by boys in Pohnpei (17%).
12	Mukherjea et al. [32] Year: 2014 Type: Descriptive Cross-sectional Country: USA	Number: 118,581 individuals Male: Not specified Female: Not specified Age: 18 years	Place: Community Based Sampling Method: Purposive sampling Data collection: Survey	Prevalence Native Hawaiians/Pacific Islanders NHPIs (20%). Prevalence of daily cigarette smoking was lower among AANHPI current cigarette smokers (68.4%) versus non-AANHPIs (76.8%)
13	Martiniuk et al. [6] Year: 2006 Type: Cohort Country: South East Asia & Western Pacific	Number: 600,000 Male: Unknown Female: Unknown Age: 20 years and older	Place: Community Sampling Method: Purposive Sampling Data Collection: Survey Questionnaire	Prevalence Smoking in the 33 countries, for which relevant data could be obtained, ranged from 28–82% in males and from 1–65% in females. Risk Factor The HRs (95% confidence intervals (CI)) comparing current smokers with non-smokers are: 1.60 (95% CI 1.49 to 1.72) for ischemic heart disease; 1.19 (95% CI 1.06 to 1.33) for hemorrhagic stroke; and 1.38 (95% CI 1.24 to 1.54) for ischemic stroke.
14	Asia Pacific Cohort Studies Collaboration [33] Year: 2009 Type: Cohort Country: Asia Pacific	Number: 378, 579 Male: Not specified Female: Not Specified Age: 20 years and over	Place: Hospital based Sampling Method: Purposive Sampling Data Collections: Questionnaire, Clinical Observations	Prevalence During a mean follow-up of 3.8 years, 2706 CHD and 3264 strokes were recorded. Risk Factors Synergistic effect of smoking on the association between BMI and CHD- (*p*-value for interaction = 0.04)
15	Tautolo et al. [9] Year:2011 Type: Cohort Country: New Zealand	Number: 766 Pacific Fathers Male: 766 Pacific Fathers Female: N/A Age: Mean age was 32.1, (SD 7.2 years), Range 17-65 years	Place: Hospital Based Sampling method: Purposive sampling Data collection: In depth Interview	Risk Factor 40.3% of Pacific Fathers are smokers
16	Barzi et al. [34] Year: 2008 Type: Cohort Country: Asia Pacific Region	Number: 512,676 Male: Unknown Female: Unknown Age: Over 20 years	Place: Community Based Sampling Method: Purposive Sampling Data Collection:	Risk Factors Mortality rates of current smokers compared to never smokers & ex-smokers-($p < 0.001$ Number of cigarettes smoked per day were higher for ANZ than Asia- $P < 0.001$
17	Nakamura et al. [35] Year: 2008 Type: Cohort Country: USA	Number: 563,144 Male: Not Specified Female: Not Specified Age: Mean Age of 47 Years	Place: Community Based Sampling Method: Available sampling Data Collection: Questionnaire	Risk Factors Risk for haemorrhagic stroke (intra-cerebral haemorrhage), among present smokers compared to non-smokers- ($P < 0.003$)-
18	Huxley et al. [36] Year: 2007 Type: Cohort Country: Asia Pacific	Number: 480125 Male: Female: Age: Analysis Focused on age 35 to 69 years	Place: Hospital based Sampling Method: Purposive Sampling Data Collection Tool: Questionnaire	Risk Factors For men: for lung cancer mortality associated with current smoking in Asia versus Australia and New Zealand- ($P < 0.0001$) For women, the corresponding estimates were 2.35 (95% CI: 1.29, 4.28) in Asia versus 19.33 (95% CI: 10.0, 37.3) in Australia and New Zealand; p for homogeneity $p < 0.0001$.

19	Carter et al. [24] Year: 2007 Type: Cohort Country: New Zealand	Number: 1398 Male: Female: Age: 6 weeks to 24 Months	Place: Hospital Based Sampling Method: Purposive Data Collection Tool: Interviewing mothers	Risk Factor Moderate increase in behavioral problems among children of Smokers- $P = 0.015$:
20	Carter et al. [37] Year: 2006 Type: Cohort Country: New Zealand	Number:1,398 Male: Female: Mothers of 1,398 Age: 6 weeks	Place: Hospital Based Sampling Method: Purposive Sampling Data Collection: Questionnaire, Interview	Risk Factors Smoking associated with reduced birth weight-($p < 0.001$) Other pacific islanders are less likely to show maternal asthma than Samoan Women-($P < 0.01$)
21	Feigin et al. [38] Year: 2005 Type: Cohort Country: Asia Pacific Region	Number: 306,620 Male: Female: Age: For analysis 20 years or older	Place: Community Based Sampling Method: Purposive Sampling Data Collection Tool: Questionnaire	Risk Factors SBP and smoking were the only significant risk factors for total SAH events. Hazard ratio for SBP _140 mm Hg was 2.0 (95% CI, 1.5 to 2.7), and that for current smoking was 2.4 (95% CI, 1.8 to 3.4).
22	Ansary-Moghaddam et al. [39] Year: 2009 Type: Cohort Country: Asia Pacific	Number: 455,409 Male: Not Specified Female: Not Specified Age: 20 and older	Place: Community Based Sampling Method: Purposive Sampling Data Collection Tool: Questionnaire, Follow-upSurveys	Risk Factor The hazard ratio for UADT cancers (95% confidence interval) for current smokers, compared with those who had never smoked, was 2.36 (1.76 – 3.16)
23	Woodward M, et al. [40] Year: 2005 Type: Cohort Country: Asia Pacific Region	Number: 463,674 Asians (33% Female), 98,664 Australasians (45% Female) Male: Female: Age:	Place: Community Based Sampling Method: Purposive Sampling Data Collection Tool: Analysis of Pre-existing data	Risk Factor The HR [95% confidence interval (CI)], comparing current smokers with nonsmokers, for CHD was 1.60 (1.49–1.72); hemorrhagic stroke 1.19 (1.06–1.33); ischemic stroke 1.38 (1.24–1.54).
24	Leistikow et al. [41] Year: 2006 Type: Descriptive Country: USA	Number: Not specified Male: Not specified Female: Not specified Age: Not specified	Place: Community Based Sampling Method: Purposive Sampling Data collection: Secondary data (from existing databases)	Risk Factors Cancer death rate smoking-attributable fractions ranged from 0 in female and 6% in male Indo-Californians, to 39% in female and 57% in male API-Americans in 2002, to 71% in Korean-Californian and 69% in API Hawaiian males.

Table 1: Data Extraction Sheet.

Results

Twenty-four studies met the study's inclusion and exclusion criteria. As Table 2 shows, 54.2% of the studies were conducted from 2005-2009, 33.3% were conducted from 2010 to the present, while only 12.5% were conducted from 2000-2004. More than half (58.3%) of the studies were cohorts while 41.7% were cross-sectional. Of the studies, 37.5% were conducted in the South Pacific while 33.3% were conducted in the Asian Pacific, and 29.2% in the American Pacific.

The highest number of studies were conducted in the USA (7 studies, 29.2%), followed by New Zealand (6 Studies, 25%), Asia Pacific (8 studies, 33.3%), Tonga, Vanuatu, and the Federated States of Micronesia (FSM) (1 Study each, 4.2%). The total study population is 4,245,437 people. For the 10 studies which specified the gender of the participants, the total participants included 367,608 males and 261,505 females.

As shown in Figure 2, 37.5% of the studies were conducted in communities, followed by 33.3% in hospitals, 25% in schools, and 4.2% in both school and community.

The results in Table 3 show that most of the studies (70.8%) used purposive sampling method, 12.5% random sampling, 4.2% convenience sampling, 8.3% stratified sampling, and 4.2% did not mention the type of sampling used. Of the studies, 87.5% used questionnaires, 4.2% used both questionnaire and observation, while 8.3% of the studies did not mention the data collection tool used.

The prevalence of smoking among Pacific people ranges from as low as 3% to as high as 75%. The highest prevalence, which was 75%, was found among Kiribati men, followed by 68.4% among native Hawaiians Pacific islanders, 64.2% among native Hawaiian students, and 51.8% among Pacific Island adolescents in Hawaii and California. The lowest prevalence was 3%, which was among pregnant women in the western Pacific region, followed by 15% among 17 year Pacific Island students in New Zealand, 17% among 15 year old boys in Pohnpei, and 29% among 15 year old boys in Tonga.

Variables	Frequency	Percentage
Year of the studies		
2000-2004	3	12.5
2005-2009	13	54.2
2010 <	8	33.3
Type of the studies		
Cohort	14	58.3
Cross-sectional	10	41.7
Region		
Asia-Pacific	8	33.3
America-Pacific	7	29.2
South Pacific	9	37.5

Table 2: The general characteristics of studies.

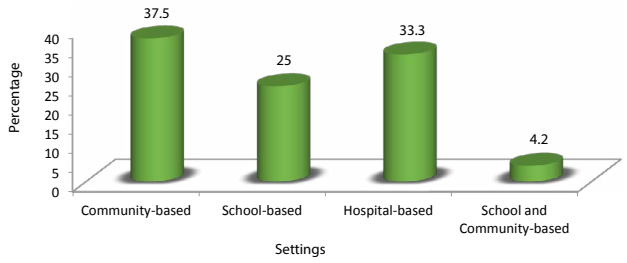

Figure 2: The frequency of the studies based on the study setting.

Variables	Frequency	Percentage
Sampling method		
Purposive	17	70.8
Random	3	12.5
Convenience	1	4.2
Stratified	2	8.3
Not mentioned	1	4.2
Data collection tools		
Questionnaire	21	87.5
Questionnaire and observation	1	4.2
Not mentioned	2	8.3

Table 3: Sampling method and data collection tools.

The prevalence is then broken down according to three specific study areas namely communities, schools, and hospitals. For the community-based studies, the lowest prevalence was 5% among women in Vanuatu and the highest was 75% among men in Kiribati. The highest prevalence in hospital-based studies was 40% among Pacific fathers in New Zealand while the lowest was 3% among pregnant women in the western Pacific Region. For schools, the highest prevalence of smoking among students was 52.1% and the lowest was 15%.

From the 12 articles reviewed on health consequences, smoking has been found to be a common risk factor for several diseases or conditions. Smoking has been found to be more commonly associated with hemorrhagic stroke than any other disease or condition among Pacific people as confirmed by 3 (25%) of the studies. On the other hand, smoking has been found to be least associated with the following: CHD (2 studies, 16.6%), higher mortality rate (2 studies, 16.6%), reduced birth weight (1 study, 8.3%), increased behavioral problems (somatic, attention deficit, aggressiveness) for children of smokers (1 study, 8.3%), maternal asthma (1 study, 8.3%), ischeamic heart disease (1 study, 8.3%), and upper aero-digestive tract cancer (UADTC) (1 study, 8.3%).

It is important to note that none of the studies highlighted smoking as a risk factor in schools. In communities, smoking has been found to be a common risk factor for developing hemorrhagic stroke, as highlighted in 2 studies (28% of the 7 community-based studies). In the community, smoking is least related to ischemic heart disease, coronary heart disease, UADT cancers, increased mortality, and increased cancer death rates, each of which constitutes 14.3% of the articles, respectively.

From four hospital-based studies, smoking is uniformly associated with the following diseases/conditions: coronary heart disease (1 study, 25%), higher lung cancer mortality (1 study, 25%), behavioral problems among children of smokers (1 study, 25%), and reduced birth weight (1 study, 25%).

Discussion

As shown in the results of this study, the prevalence of smoking in the Pacific is as high as 59.3% in women and 75% in men. However, the prevalence for smoking varies in other studies, as shown in Rasanathan et al. [1] with (22%-57%) in males and (0.6%-51%) in females, as reported in 2007 in Pacific Island countries and territories [1,9]. The variation could be the result of the inclusion of more recent studies of prevalence reports in this study. In addition, smoking was found to be more prevalent in men. This shows that Pacific Island males are more likely to be smokers than their female counterparts [8,9]. This is due to the social norm and men's positions and roles in Pacific Island societies, as supported by Kessaram et al. [10]. The findings in this study regarding high prevalence of smoking among males are consistent with studies in the United States, Asia, and Europe [11-13].

In addition, this study found the prevalence among Pacific youths to be as high as 52.1%. This is very high as compared to youths in Europe 22%, Asia 5.4% [14,15]. Many Pacific Islanders come from low-middle income families and, as highlighted by other studies, smoking prevalence is higher among youths from disadvantaged groups [16-18].

Moreover, the consequences of smoking found in this study include the following: hemorrhagic stroke, ischemic heart disease, coronary heart disease, UADT cancers, increased mortality, increased cancer death rate, higher lung cancer mortality, behavioral problems among children of smokers and reduced birth weight. As shown in the results, the consequences of smoking found to be most common within communities is hemorrhagic stroke. The results of such a high rate of hemorrhagic stroke in Pacific communities is largely due to the high prevalence of smoking and poor diets among Pacific people [1,6,19]. For the hospital-based studies it was found that smoking is homogenous across four main consequences and they are as follows: CHD, higher lung cancer mortality, behavioral problems among children of smokers, and reduced birth weight. Other studies have also shown that smoking is commonly linked to the occurrence of CHD and lung cancer [20,21].

The results from this study show that from 2000-2004 only three studies were conducted. The number increased to 13 from 2005-2009 and then dropped back down to 8 from 2010 to the present. This drop is a concern because there is limited research done in the Pacific. All of the studies reviewed are either cohort or cross-sectional in nature and lack any interventional study. As supported by Nosa et al. [21], the lack of any interventional study presents some limitation when it comes to determining actual causality for a certain disease or condition, whether it is actually a result of smoking or otherwise [22].

Furthermore, the results also show that many of the studies were conducted in communities and hospitals (37.5% and 33.3%, respectively), while only 25% of studies were conducted in schools. More studies need to be conducted in the schools considering that Pacific Island adolescents have higher prevalence of smoking, as highlighted by Wu et al. [22,23]. Additionally, it is important to have more studies on smoking done in schools because it is at this age where behavior change is easier and they can also act as influencers for others close to them (family, peers) to also quit smoking [23]. Moreover, most of the studies (70.8%) included in this review utilized the purposive sampling method. A randomized sampling approach would significantly reduce bias in the results and increase the generalizability of the results [24].

From the results, smoking is more prevalent in men, as well as youths, in the Pacific. Therefore, smoking interventions and policy efforts need to be directed toward prevention and reduction of smoking among males and youths of the Pacific Islands. Tobacco prevention strategies focusing on all people, through increasing people's knowledge about the harmful effects of smoking, can be more successful [25]. Schools can be one of the more important places, as highlighted in this study, to implement tobacco prevention and cessation programs. It is very important to recognize the target groups, such as adult smokers as highlighted, and develop comprehensive plans for tobacco prevention and control. Developing anti-smoking mass media campaigns, while considering people's cultural beliefs, to change smoking behavior is essential [25]. People need to be informed about the policies and adherence to smoking policies in schools. Policy makers need to practice other activities such as increasing smoking cost through taxation, and expanding anti-smoking zones and environment.

As a limitation of the study, it is noted that the search was only on English-language publications, which may affect accessibility to other valuable studies which were published in languages other than English.

Conflict of Interest

There are no conflicts of interest to disclose.

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