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DETERMINANTS OF SUICIDE IN PACIFIC REGION AND NEEDS FOR CONSIDERING EQUALITY AMONGST PACIFIC PEOPLE: A SYSTEMATIC REVIEW

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Running Title: Determinants of suicide in Pacific region

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ABSTRACT:
Globally, the World Health Organization (WHO) estimates that at least 800,000 individuals lose their lives each year, as a result of suicide. Due to lack of previous studies in the Pacific region, this systematic review is written to identify the available literature on suicide in the Pacific region and its respective prevalence and determinants. Furthermore, this study set out to investigate any evident inequalities present within the Pacific regarding suicide. This systematic review study applied Cochrane Library Guidelines to search, review, appraise, and analyse articles related to suicide. Both qualitative and quantitative articles published between 2000 and 2017 in English language and published in databases such as Medline, Cumulative Index to Nursing and Allied Health Literature (CINAHL), PsychInfo, ExcerptaMedicaDataBASE (EMBASE), Scopus, and Web of Science were selected. Medical subheadings (MeSH) and keywords were utilised to achieve the relevant articles. A data extraction sheet was created, and descriptive statistics applied to analyse the data. A total of 24 peer reviewed research papers were included. Majority of studies were conducted in New Zealand (29.15%) and only one of these studies was applied as a randomized controlled trial. Questionnaires were the most frequently used data collection tool. There were five largely evident determinants of suicide factors - culture and ethnicity (15 studies), religion (9 studies), marital issues (10 studies), gender (11 studies) and mental health (12 studies). The results of this study highlighted the main determinates which affect equality among Pacific people regarding to Suicide. They are reason enough for further research as they can allow medical professionals to design preventative measures for these groups who can be considered high risk.

Keywords: Prevalence, Determinants, equality, suicide, Pacific
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INTRODUCTION:

Over the years the issue of suicide has become more and more alarming in modern day society. Suicide is defined as the act or instance of taking one's own life voluntarily or intentionally [1].This is done through various methods which can include self-mutilation, poisoning, asphyxiation, drug overdose, hanging and burning [2]. Moreover, with programs such as the World Health Organization (WHO) Suicide Trends in At Risk Territories (START) initiative, more light is now being shed on the issue at hand [3].

Globally the WHO estimates that at least 800,000 individuals each year lose their lives as a result of suicide [4]. Additionally, it was found that in 2015, suicide was responsible for 1.4 percent of all deaths worldwide making it the seventeenth leading cause of death in the same year [5]. Despite this, researchers believe that for every suicide related death at least 20 unrecorded suicide attempts were recorded.

Most alarming is the fact that 78% of the total recorded suicides were reported from low to middle income countries.

Currently the global suicide trend is set at one death ever forty seconds, however it is estimated that by the year 2020 the rate will increase to one death every 20 seconds [6]. This correlates to an estimated average of 10.7 suicide deaths per 100,000 population deaths. Hence suicide is an issue that is of grave concern and needs to be addressed [7].

In light of the alarming global statistics a key demographic that needs to be monitored in terms of suicide is that of the Pacific Islands; as in a comparative study carried out by the Australian National University (ANU) it was found that Pacific Island countries had some of the highest rates of suicide when compared to western countries[8]. Other key findings of this study included that females made up the majority of the reported cases in island countries such as Fiji and Samoa [9]. Further evidence of this was found in a study published by the New Zealand Medical Journal which reported that youths in Pacific region were three times more likely than European youths to commit suicide [10].

Furthermore, methods such as hanging, and pesticide poisoning were found to be common in the Pacific islands [11]. In studies setting out to investigate the use of the pesticide paraquat as a poison, it was found that large nations such as South Korea have put in place policies which make paraquat harder to obtain [12].

Another research was carried out in Western Samoa and resulted in a slight decline in the suicide rate. However, a study by Laura Wyatt set out to determine the key determinants of suicide in the Pacific and one major determinant found was depression [13]. The article went on to explain that 11% of Pacific

youths experience some form of depression by the age of 18[13].This was due to various factors such as bullying, physical abuse and neglect among youths. Hence this indicates proves that suicide is a matter of grave concern within the Pacific.

Hence with the high rates in the Pacific there is currently a need for more research on the topic of suicide in this region. This systematic review is written to identify the available literature on suicide and shed some light into the prevalence and determinants in the Pacific region. Furthermore, this study set out to review any evident inequalities present within the Pacific regarding suicide.

METHODOLOGY:

The systematic review was conducted using the Cochrane Library Guidelines. The following databases were used to obtain relevant articles: Medline, CINAHL, Psych Info, EMBASE, Scopus, and Web of Science. The databases used were common among studies involving violence, which is why they were selected. Medical subheadings (MeSH) and keywords were used to achieve the relevant articles which included, violence*, prevalence, determinants and Pacific. To further the search for articles, AND & OR were used to combine the search parameters. The articles included in this study were from the January2000 to July 2017, in the English language; peer reviewed and had full text accessible.

To protect the study from selection bias, two independent reviewers scanned the titles of all available studies and removed the irrelevant studies. The reviewers then read the abstracts of the remaining studies, again removing the irrelevant studies. The third step conducted by the reviewers was reading of the full texts in order to obtain the final articles. Twenty-one studies met the study inclusion criteria [14,15] (Figure 1).

Once this was done, the reviewers searched the bibliographies of the selected studies in order to find more relevant articles. Following this, three more articles were accepted bringing the total to twenty-four. The studies full texts were then printed for further analysis. Using the information from the selected studies, an extraction sheet (Annex 1) was developed with four sections, which were: study information, population, methodology and results.

A descriptive analysis was then carried out and frequencies and percentages were recorded.

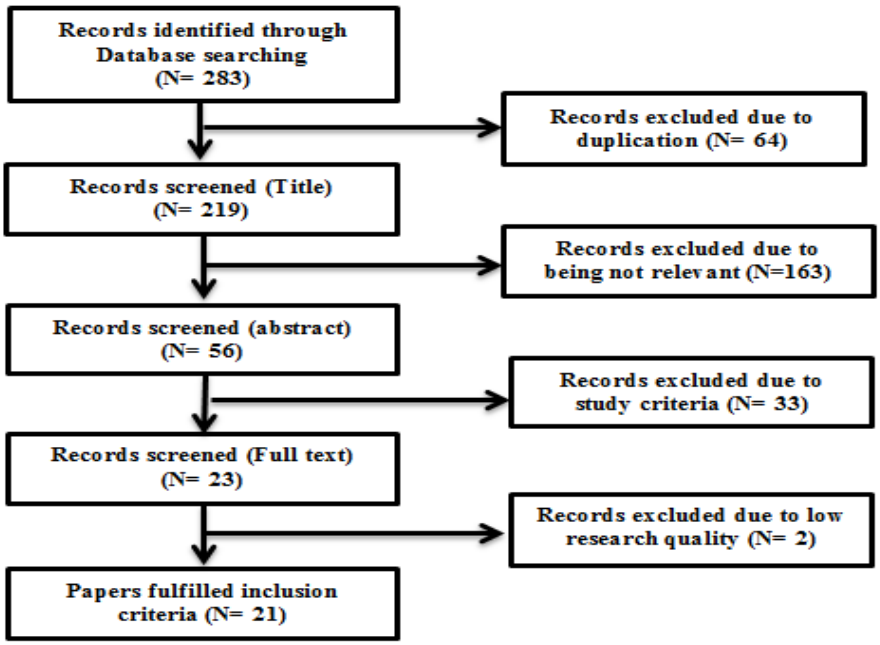

Figure 1: Article selection process

FINDINGS:

A total of 24 studies were selected. Of these 7 (29.2%) were conducted in New Zealand, 6 (25.0%) in Fiji and also in the US and 5 (20.8%) in other Pacific countries. The results also showed that 10 (41.7%) studies were conducted between 2011 to 2017 and 14 (58.3%) studies were between 2000 and 2010. For the study settings, 11 (45.8%) were community based, 7 (29.2%) were school-based and 6 (25.0%) were hospital-based studies

The pool number of participants within the 24 studies was 271785. Majority of the studies were cross sectional (83.3%), 2 (8.3%) was qualitative and only one (4.2%) was randomized controlled trial. Purposive sampling was applied for 20 (83.3%) studies random sampling for 3 (12.5%) and one convenience sampling. For data collection methods, questionnaires were used in 12 (50.0%), Case reports in 10 (41.7%) and 2 (8.3%) used focus group discussion to collect the data.

The number and percentage of the various studies indicated the determinants of suicide factors are shown in Table 1 such as culture and ethnicity 15 (62.5%) studies, religion 9 (37.5%) studies, marital issues 10 (41.7%) studies, gender 11 (45.8%) studies and mental health 12 (50.0%) studies.

There are some other factors that are reported as determinants of suicide among Pacific people. They include unemployment, age, and substance abuse, lack of supportive environment, social status, experienced violence, and education status, family problems, and parenting, peer pressure, and family history of suicide.

Table 1: More frequent and less frequent determinants of suicide

More frequent determinants of suicide	
Determinant	Frequency
Culture and ethnicity	15 (62.5%)
Religion	9 (37.5%)
Marital Status/Problems	10 (41.7%)
Gender	11 (45.8%)
Mental Health	12 (50.0%)
Less frequent determinants of suicide	
Social status	5 (20.8%)
Unemployment	7(30.0%)
Peer Pressure	2(10.0%)
Experienced violence	5 (20.8%)
Family history of suicide	2 (10.0%)
Education	5 (20.8%)
Family problems	4 (16.0%)
Age	7(30.0%)
Substance abuse	7(30.0%)
Parenting	2(10.0%)
Lack of supportive environment	6 (25.0%)

NB: Results for percentages are cumulative, thus do not add up to 100

DISCUSSION:

This study set out to identify the evident determinants of suicide in the pacific based on the data published in 24 different studies from 2000 to 2017. A total of 16 factors considered as determinants of suicide were identified. Out of the 16 there appear to be five (31.3%) largely evident factors. These 5 factors are culture and ethnicity, religion, marital issues, gender and mental health.

The first major factor or determinant of suicide is that of culture and ethnicity. Within the Pacific, culture is something that all of the various nations hold dear and is revered throughout the region. In a study conducted by Thomas McDade on the effects of cultural status among Samoan adolescents, it was found that cultural status had a biological impact on the youths and affected their stress levels directly [16]. This stress or drive can

have detrimental impacts on the adolescents causing mental strain and even suicide ideation. Additionally, mental illness is looked down upon in certain cultures to the point where issues such as depression are often ignored [17]. This neglect and sense of abandonment can be a stepping stone for suicide ideation and in the long run lead to the act itself. Hence the culture of Pacific Islanders needs to be considered when looking at the issue of suicide.

The review also suggests that religion is an important determinant of suicide. Despite being observed in multiple studies, religion also appeared to be considered as a protective factor against suicide [18]. This is further backed in a report published by De Leo which stated that integrated methods need to be used when approaching the issue of suicide involving factors such as race and religion [19]. Additionally, in a study by Lizardi it was stated that by identifying an individual's religion the suicide risk of that individual can be obtained [18]. This as explained by the article would be done by assessing the religions stance on suicide. For example, Christianity, Islam and Hinduism do not condone suicide. Therefore, religion as implied in the mentioned studies can be a useful tool if integrated into suicide prevention strategies [20].

Another determinant identified within this study which appeared to be evident was that of marital status and marital issues. Marital issues and disagreements can have very scaring and strenuous impacts on an individual's mental state. In a study conducted among the people of Tokelau it was found that marital and relationship issues were two of several factors that can lead to suicide [21].A similar study conducted to assess the impacts of divorce among individuals varying in age gender and ethnicity demographics found that the divorced groups were more vulnerable to suicide [22].Due to the culture of the Pacific Islands, marital problems are issues that are not often openly discussed. Accompanied by stress and other concerns for image and wellbeing, marital problems can be disastrous for both individuals in the relationship if not taken seriously. Hence the need to include marriage counselling or relationship advice sessions is paramount in suicide prevention strategies for those that fall within the divorced groups.

The next determinant that was evident in this review was that of gender. Although ratios vary depending on the location, target population and age range, it is evident that there are noticeable differences in gender-based suicide rates. In a study conducted by Peeter Varnik who set out to analyse the WHO mortality statistics it was found that males had a higher suicide rate than females globally [23]. This according to Valerie Callanan was due to the lethality of suicide methods used by males when compared to those of females [24]. According to the Callanan's study it found that unmarried men were more likely to hang themselves than unmarried women. However,

these studies do not highlight, if any, the differences due to attempted suicides as they only focus on successful suicides. Hence further research into gender disparities relating to suicide need to be carried out.

The next factor that was determined by this systematic review was that of mental illness. According to a study by Bostwick it was estimated that the lifetime risk of suicide due to mental illness was 15%, however after conducting a meta-analysis based on that figure, Bostwick concluded that the risk of suicide for patients with affective disorders was only 4% [25]. A similar study conducted in New Zealand found that Pacific Islanders accounted for a high number of mentally ill comparing to other factors. The study however then went on to include that the islander who was born in their home country had a lower prevalence of mental disorders [26]. Despite this, it is common in the Pacific for mental illnesses to be stigmatized and in some cases be ignored, for example depression. According to Jennifer Ritsher, stigmatization of mental illness can lead to social withdrawal, perceived discrimination and negatively affect recovery orientation [27]. This in the long run can lead to suicide ideation and further down the road suicide itself. Hence the issue of mental health needs further consideration with regards to suicide.

Additionally, our study identified various other determinants of suicide which included physical violence, substance abuse, unemployment, social status, family history of suicide, family problems, peer pressure, age, education status, experienced violence, parenting, and lack of supportive environment. These show that the issue of suicide is very complex and requires much more consideration before the issue can be tackled or preventative measures decided upon.

Despite the lack of studies based solely on inequalities in the Pacific, minor inequalities were evident in the results of this review. The first inequality evident is that of socioeconomic status and its role in making inequality among people to receive health services. In a study conducted in Scotland lower socioeconomic status was linked directly to a higher risk of suicide [28]. These inequalities were also linked to employment, education and income with all those in the lower socioeconomic status lower socio-economic classes having higher risk of suicide.

The next inequality that was evident through this study was that of gender differences in suicide rates. Globally men have higher rates of successful suicides when compared to females [23]. According to a study by Anne Maria Möller-Leimkühler it was found that this may be due to social change, societal issues, redefinition of the male gender role and different societal conditions [29]. These inequalities are reason enough for further research as they can allow medical professionals to design preventative measures

for these groups who can be considered high risk.

CONCLUSION:

This review set out to investigate the determinants and inequalities surrounding suicide in the Pacific and it suggests that culture and ethnicity remains asthe main contributing factor for suicide. This review also raises an important question about religion as a second most important contributing factor for suicide among the pacific population. Though not all suicides are preventable but wide-ranging risk assessment approach may help the health service providers to provide support to those who are at risk of committing suicide and also it is not clear from the studies that who committed suicide whether they took professional mental health services. Further research is needed to detect who are at risks and community awareness regarding this issue should be raised.

Annex 1: Data Extraction Sheet

Article	Participants	Methods	Results
H.S. Aghanwa[30] Year:2000 Country: Fiji TypeofStudy: Comparative	Number:39 Age:16-25 Male:15 Female:24	Sampling: Purposive Data Collection: Interviews, Case reports Place: Colonial War Memorial Hospital	**Prevalence**: 34.8 cases per 100,000 **Determinants**: Age, Ethnicity, Gender, Marital Status, Religion
Henry. S. Aghanwa [31] Year: 2001 Country: Fiji Type of Study: Cohort	Number:58 Age: N/A Male:16 Female: 42	Sampling: Purposive Data Collection: Patient Register Place: Colonial War Memorial Hospital Fiji	**Prevalence**: An estimated 25.9 self-poisoning cases per 100,000 population **Determinants**: Gender, Ethnicity, Religion, Marital Status, Employment **Suicide Methods**: Poisoning, Drug overdose
Henry Aghanwa [32] Year: 2004 Country: Fiji Type of Study: Comparative	Number: 128 Age: Mean (Male: 25.15) (Female: 22.99) Male:40 Female:88	Sampling: Purposive Data Collection: Patient Registry Place: Community	**Prevalence** Females (88) committed more suicide attempts than males (40) **Determinants**: Occupation, Marital Status, Religion, Ethnicity, Alcohol, Societal issues
Stéphane Amadéo [33] Year: 2015 Country: French Polynesia Type of Study: Randomized Control Trial	Number:200 Age: N/A Male:67; Female:112 10 unaccounted for in article	Sampling: Purposive Data Collection: Interviews and START patient Registry Place: Community	**Determinants**: Gender, Marital Status, Employment, Psychiatric Disorder
Shane Shucheng Wong et al.,[34] Year: 2012 Country: America Type of Study: Comparative	Number:88,532 Age:9th grade to 12th grade Male:43,366 Female:44,833	Sampling: Purposive/ Cluster Data Collection: Questionnaires Place: School	**Determinants**: Age, Ethnicity 1 in 6 suicides for pacific islanders in America
Peter. M.Foster et al., [35] Year: 2012 Country: Fiji Type of Study: Descriptive	Number: N/A Age: N/A Male: N/A Female: N/A	Sampling: Purposive Data Collection: Police Reports Place: Community	**Prevalence:** 15 per 100000(Males) and 11 (Females) **Determinants**: Ethnicity, Marital Status, Education
Marco Innamorat i[36] Year:2011 Country: Type Study: Cross sectional	Number: 32,160 Age: 12–15 Male: N/A Female: N/A	Sampling: Purposive Data Collection: Survey Place: School	**Determinant**: Smoking linked to higher suicide ideation

Thomas K. Pinhey[37] Year: 2004 Country: Guam Type of Study: Descriptive	Number: 1,381 Age: N/A Male: 674 Female: 707	Sampling: Purposive Data Collection: Surveys Place: School	**Determinants**: Sexual Orientation
Graham Roberts [38] Year:2007 Country: Fiji Type of Study: Descriptive	Number: 132 Age: 10-75 Male: 45 Female: 87	Sampling: Purposive Data Collection: Case Reports Place: Hospital	**Determinants**: Gender, Religion, Ethnicity, Education Level, Marital Status, Age, Stress, Abuse, Mental Illness **Prevalence:** 90% of attempted suicide cases were indo Fijian, 66% were female
Priyata Thapa [39] Year: 2015 Country: US Type of Study: Descriptive	Number: 174 Age: about 20 Male: 56 Female: 118	Sampling: Purposive Data Collection: Self Recorded questionnaires Place: Community	**Determinants**: Knowledge, Age, Religion, Education, Mental Health
Annette L. Beautrais [40] Year: 2001 Country: New Zealand Type of Study: Descriptive	Number: 61 Age: 15 Male: N/A Female: N/A	Sampling: Purposive Data Collection: Case Reports Place: Community/Hospital	**Determinants**: Ethnicity, Family Disputes **Method of Suicide** Hanging, Poison, Firearms
Y. Joel Wong[41] Year: 2017 Country: US Type of Study: Descriptive	Number: 92,754 Age: N/A Male: N/A Female: N/A	Sampling: Purposive Data Collection: Case Reports/National Violent Death Reporting System Place: Community	**Determinants**: Mental Health, Socioeconomic status, partner problems, Suicide ideation
Karl Peltzer [42] Year: 2017 Country: Four Oceania Countries Type of Study: secondary analysis	Number: 6540 Age: 13 -16 Male: 2846 Female: 3534	Sampling: Systematic Data Collection: Survey Place: School	**Determinants**: Alcohol Use, Cannabis, Psychological Distress, Bullied, Physical Fighting
Song Chan[43] Year: 2001 Country: New Zealand Type of Study: Survey	Number: 8500 Age: N/A Male: 3874 Female: 4623	Sampling: Randomized Data Collection: Questionnaires, Survey Place: Community	**Determinants**: Age, Gender, Ethnicity, Socioeconomic status, Emotional state **Prevalence** 4.5% of the total population had attempted suicide at least once 7.9% had self-injured
C. June Strickland [44] Year: 2006 Country: US Type of Study: qualitative and quantitative	Number: 40 Age: N/A Male: N/A Female: N/A	Sampling: Purposive Data Collection: Focus Groups Place: Community	**Determinants**: Violence, Family Problems
JemaimaTiatia-Seath [45] Year: 2014 Country: New Zealand Type of Study: Qualitative	Number: 22 Age: 18+ Male:13 Female: 9	Sampling: purposive Data Collection: interview Place: community/Hospital	**Determinants**: Cultural views of mental illness
Theresa M. Fleming [46] Year: 2006 Country: New Zealand Type of Study: Descriptive	Number: 9570 Age: 9-13 Male: N/A Female: N/A	Sampling: Purposive Data Collection: Survey Place: School	**Determinants**: Parenting, Family support, School Staff, Supportive School Environment, Neighbourhood, Religion
Annette L. Beautrais [47] Year: 2006 Country: New Zealand Type of Study: descriptive study	Number: 12 992 Age: 16 years and over Male: N/A Female: N/A	Sampling: Purposive Data Collection: Survey Place: Community	**Determinants**: Sex, Age, ethnicity, education, Anxiety disorders, Mood Disorders, Substance abuse, eating disorders Suicide ideation Evident among 15% of study population
Iwalani R. N. Else[48] Year: 2007 Country: United States Type of Study: Descriptive	Number: N/A Age: N/A Male: N/A Female: N/A	Sampling: purposive Data Collection: Surveys Place: Community	**Determinants**: Ethnicity, gender, education, Sexual attitudes, Coping skills, family relations, parenting
Henry Aghanwa [32] Year: 2004 Country: Fiji	Number: 128 Age: N/A Male: 40	Sampling: convenience Data Collection: Suicide cases Place: Community/Hospital	**Determinants** Ethnicity, Religion, Occupation, Marital Status

Type of Study: Descriptive	Female: 88		**Suicide Methods:** Violent, Herbicide, Drug overdose **Prevalence**: Suicide was higher among females
Siale A[49] Year: 2006 Country: New Zealand Type of Study: descriptive	Number: 12 992 Age: 16> Male: 6756 Female: 6236	Sampling: purposive Data Collection: survey Place: community	**Determinants**: Anxiety disorders, Mood disorders, Substance use disorders, Eating disorders **Prevalence**: Lifetime prevalence of 16.5%
Hilario B. Fontecilla [50] Year: 2012 Country: Type of Study:	Number: 210 countries Age: N/A Male: N/A Female: N/A	Sampling: Purposive Data Collection: World Bank's official website and WHO's mortality database Place:	**Determinants:** There is a negative correlation between high income and developing countries , e.g. Canada, Australia and New Zealand
TasiletaTeevale [10] Year: 2016 Country: New Zealand Type of Study: Descriptive	Number: 1,445 Age: 12-19 Male: 592 Female: 797	Sampling: random Data Collection: survey Place: school	**Prevalence** high incidence of self-harm among participants (27.3%) High suicide ideation (23.3%), 11.6% had previous suicide attempts **Determinants**: Cultural, religion, Family issues, peer issues, life satisfaction, health seeking behaviours, family history of suicide
Iwalani R.N. Else[51] Year: 2009 Country: United States Type of Study: descriptive	Number: 881 Age: 10-14 Male: 351 Female: 530	Sampling: Purposive Data Collection: survey Place: school	**Suicide indicators:** Isolation, Social status, peer pressure, physical violence, sexual coercion

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