An Epidemiological Study of Indigenous Hawaiian Youth

Kamehameha Schools Research Conference

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North Shore, Hawai`i

Learning Objectives (3)

- Report on the rates of mental disorders, using DSM-III-R diagnoses among a community sample of Native Hawaiian adolescents (ages 13 - 18 years)

- Compare the findings of the Hawai‘i study to other reported studies of adolescent prevalence rates which used the DSM-III-R

- Discuss clinical and research implications of the reported findings

Presentation Outline

I. Introduction - Purpose & Significance of this Study
II. Hypotheses (3)
III. Methods (2 phase design)
    - Phase 1: Hawaiian High Schools Health Survey (HHSHS)
    - Phase 2: DISC
IV. Results
    • Prevalence Rates of the DISC diagnoses
    • Meta-analyses
V. Discussion
    • Clinical & Research Implications

I. Introduction: Purpose & Significance of Study

Epidemiological Studies using DSM - criteria

- Transform measures of adversity into Diagnoses
- Diagnoses specify course, prognosis, treatment
- Diagnoses refine interventions (Prevention & Treatment)

Creating an Epidemiological Map of a Community Population

- Elucidates the bio-psycho-socio-cultural factors in the genesis, expression and persistence of illness

Factors (risk, protective, mediating, resilience) allow us to

- Develop models for interventions
- Understand the Role of Culture

I. Introduction: Significance of the Study

- When compared to Caucasians, Japanese, Filipinos, and Mixed-Non-Hawaiians, Kanaka Maoli have higher rates of—
  - > Domestic Violence and related homicides
  - > Teenage pregnancies, child abuse & neglect
  - > Depression and Suicide
  - > Alcohol & Substance Abuse Disorders
  - > Poor School performance & Dropouts
  - > Juvenile and Adult Incarcerations

I. Introduction: Kanaka Maoli Youth Measures of Psychopathology

- Studies published from our Research Team:

  > Makini et al. Higher mean scores for depressive, anxiety, aggressive, and substance abuse symptoms.

  > Yuen et al. Higher suicide rates, especially young men.

  > Goebert et al. Experience higher levels of family adversity and that the cumulative effect of family adversity had a greater effect on psychopathology.

  > Hishinuma & Andrade, Highest levels of Learning Disabilities.

II. Hypotheses (3)

(1) Prevalence Rates will reflect existing psychopathology trends, with Hawaiians having higher rates than their non-Hawaiian.

(2) Prevalence rates for Hawaiians will follow trends shown in comparable “high risk” groups (e.g., Native American, poor, or homeless youth).

(3) Rates of Internalizing disorders will be higher among girls while rates for externalizing disorders will higher among boys.

III. Methods

- Two - Phase Design

  ~ Phase 1 - Hawai`i High School Health Survey (HHSHS)

  ~ Phase 2 - Diagnostic Interview Schedule for Children, version 2.3 (DISC - 2.3)

III. Methods: Phase II Instruments, DISC - 2.3 version

- Computerized, structured interview administered by lay interviewers
- We ascertained DSM-III-R diagnoses for:
  - ~ mood disorders
  - ~ anxiety disorders
  - ~ disruptive disorders
  - ~ substance abuse/dependence disorders

III. Methods:
Phase I - HHSHS Participants

- 12,284 Hawai`i High Schools Health Survey were completed over the 5-year period
- 7,317 high school (9-12th grade) students were surveyed
- 27.4% of all Native Hawaiian adolescents in Hawai`i were surveyed
- 5 Hawai`i high schools, located on 3 different islands, participated in the study

III. Methods:
Phase II - DISC Participants

- Total of 611 DISC interviews completed over a 4-year period
- 29 students were “high risk”
  - > CES-D score 35 or more
  - > Suicide attempt by family member, friend, or student
    6 months prior to HHSHS
- 582 students were randomly selected from the students taking the HHSHS

III. Methods:
Phase II - DISC Participants

- Ethnic make-up up of participants (self-report):
  - ~ 355 (58.1% Hawaiians)
  - ~ 256 (41.9% non-Hawaiians)
- Non - Hawaiian Participants included:
  - 19 (3.1%) Caucasians
  - 39 (6.4%) Filipinos
  - 64 (10.5%) Japanese
  - 128 (21.9%) mixed/non-Hawaiians (Multi-ethnic group)
  - 6 “other” of non-mixed ancestry

III. Methods
Statistical Analyses

Re-sampling Weights

- Ethnic Groups - to statistically create a representative sample of the under and over represented groups, based on the State of Hawai‘i population estimates for youth.
  - – Ha: 58.1% (29.6%), Ca: 3.1%(13.1%), Ja: 10.5%(14.9%), Fi: 6.4%(13.4%), and Mixed/Non-Ha: 21.9%(29.1%)

- “At - Risk Participants” - were weighted by CES-D scores and suicide attempts, in order to include this group into the sample (N=29). [“Norm” population from HHSHS 1992-93]
  - – CES-D ≥ 35 11.6% [7.4%]; Suicide Behav 18.1% [16.7%]

III. Methods
Statistical Analyses (cont'd)

- Overall prevalence rates calculated for each diagnostic category - Mood, Anxiety, Disruptive, Substance Disorders
- Univariate logistic analyses used to test for differences within and between groups by ethnicity and/or gender.
- Multiple logistic analyses used for each diagnostic category to determine if there were any ethnicity-by-gender interactional effects.

III. Methods - Comparison Studies Meta - analyses

- Selection Criteria for Comparison Studies (4)

  (1) a community epidemiological study

  (2) adolescent participants between age 13 - 18 years

  (3) diagnostic instruments ascertain DSM-III-R diagnoses

  (4) availability of standard errors for prevalence rates.

III. Methods - Comparison Studies
Meta - analyses (cont'd)

Community Samples (randomly selected within communities):

- Four studies: Jensen et al. , Lewinsohn et al., Shaffer et al., Verhulst et al.

High Risk Studies (reservations, poor health, homelessness, poverty):

- Two studies: Beals et al. and Buckner & Bassuk

IV. Results

Prevalence Rates
of
Psychiatric Disorders

IV. Results - Mood Disorder By Gender & Ethnicity

Mood Disorder	Haw. Male (HM)	Haw. Female (HF)	NonH. Male (NM)	NonH. Female (NF)	Selected Comparisons	R^2
Major Depression	4.5%	9.7%	4.0%	7.1%		
Dysthymia	2.8%	6.2%	0.3%	4.9%	NF > NM	10.4%
Mania-Hypomania	1.0%	1.7%	2.8%	0.0%		
Any mood disorder	5.8%	13.8%	6.8%	8.2%	HF > HM	2.8%

IV. Results - Anxiety Disorder By Gender & Ethnicity

Anxiety Disorder	Haw. Male (HM)	Haw. Female (HF)	NonH. Male (NM)	NonH. Female (NF)	Selected Comparisons	R^2
Overanxious	6.8%	9.5 %	1.0%	6.9%	HM > NM NF > NM	9.1% 7.7%
Social Phobia	2.3%	7.0%	4.9%	6.2%	HF > HM	3.2%
Obsessive-Compulsive	9.2%	17.7%	3.6%	9.2%	HF > NF HF > HM	1.9% 2.0%
Generalized Anxiety	2.3%	8.4%	1.0%	6.2%	HF > HM NF > NM	4.4% 7.0%
Any anxiety disorder	14.5%	26.1%	7.5%	17.6%	HF > HM NF > NM	2.0% 3.2%

IV. Results - Disruptive Disorders By Gender & Ethnicity

Disruptive Behavior Disorder	Haw. Male (HM)	Haw. Female (HF)	NonH. Male (NM)	NonH. Female (NF)	Selected Comparisons	R^2
Attention Deficit	1.7%	3.2%	2.5%	2.4%		
Conduct	4.5%	3.9%	0.4%	4.3%	HM > NM NF > NM	13.0% 9.4%
Oppositional-Defiant	2.6%	2.0%	2.2%	1.0%		
Any disruptive disorder	5.7%	7.3%	2.9%	6.7%		

IV. Results - Substance Disorders By Gender & Ethnicity

Substance Disorder	Haw. Male (HM)	Haw. Female (HF)	NonH. Male (NM)	NonH. Female (NF)	Selected Comparisons	R^2
Any Substance Abuse	1.2%	0.9%	4.6%	1.1%		
Any Substance Dependency	14.5%	9.5%	7.8%	6.7%		
Any Substance Disorder	15.1%	10.1%	10.4%	7.1%		

IV. Results - Prevalence Rates Phase II (DISC) - Across Studies

Study		Any Mood Disorder	Any Anxiety Disorder	Any Disruptive Disorder	Any Substance Disorder	Any Disorder
Andrade (2000)	HM	5.8%	14.5%	5.7%	15.1%	26.8%
	HF	13.8%	26.1%	7.3%	10.1%	37.7%
	NM	6.8%	7.5%	2.9%	10.4%	19.6%
	NF	8.2%	17.6%	6.7%	7.1%	27.9%
Surgeon Gen.		6.2%	13.0%	10.3%	2.0%	20.9%
Lewinshon		2.9%	3.2%	1.8%	2.3%	9.6%
Shaffer		4.3%	12.3%	4.7%	2.0%	18.2%
Verhulst		3.4%	3.8%	6.7%	1.5%	8.4%
Beals*		10.6%	5.5%	13.8%	18.3%	29.4%
Buckner*		4.7%	18.1%	17.0%	0.0%	31.9%

*Surgeon General (MECA study) = mild global impairment as well, 9-17 year olds; Lewinshon (1993) = high school; Shaffer (1996) = 9-17 year olds; Verhulst (1997) = 13-18 year olds; * Beals (1997) = 14-16 year-old Native Americans; * Buckner (1997) = low-income/homeless 9-17 year olds.*

V. Discussion
Clinical & Research Implications

- The findings support 2 of the 3 hypotheses. As expected,

- Hawaiians had higher disorder rates than Non-Hawaiians

  Any Disorder:

  Hawaiians: All = 32.7% (1 in 4)

  Non-Hawaiians: All =23.7% (<1 in 4)

  Hawaiian Girls = 37.7% (>1 in 3)

  Surgeon General: All = 20.9% (1 in 5)

- Meta-analyses of Hawaiian youth follow similar trends as Native American and other high risk youth in America

V. Discussion
Clinical & Research Implications

- Third Hypothesis on Gender and Internalizing vs Externalizing Disorders was complicated by Ethnicity.
  - Overall:
    - Girls rates of internalizing disorders higher, but
    - Boy did NOT have higher rates of externalizing disorders
  - Conduct Disorder Rates:
    - Non-Hawaiian Girls > Non-Hawaiian Boys
    - No differences between Hawaiian girls and boys

V. Discussion
Clinical & Research Implications

Possible Explanations for Externalizing Disorders findings:

- Sample loss of boys due to School dropout
- Girls manifest as non-aggressive type (stealing), as opposed to aggressive type (fighting)
- Girls may perceive themselves as more aggressive than boys (Gjerde et al., 1988)
- Cultural Hypothesis (Pukui, Haertig, McDermott, 1972) that internalizing disorders are manifested by symptoms of aggression, based on dream analyses that grief, sadness & guilt expressed in dreams as aggression.
  Could Depression in Girls manifest as disruptive behaviors?

V. Discussion
Clinical & Research Implications

Obsessive Compulsive Disorder (OCD) Prevalence:

- Surgeon General rate = 2.0%

- OCD Hawaiian & Non-Hawaiian rate = 8.4%

Hawaiian:	Non-Hawaiian:
Girls = 17.7%	Girls = 9.2%
Boys = 9.2%	Boys = 3.5%

V. Discussion
Clinical & Research Implications

Explanations and Implications of OCD findings:

- Psychometrics DISC 2.3 validity and reliability

  We adjusted for specific functional impairment for all positive OCD diagnoses.

- Pediatric Autoimmune Neuropsychiatric Disorders (PANDAS) the neuropsychiatric equivalent of rheumatic fever from post-group A Beta-hemolytic streptococcal throat infections. (Guerrero et al., 2002; Leonard et al, 1999; Swedo et al., 1995)

V. Discussion
Clinical & Research Implications

PANDAS Research Implications:

- GABHS throat infection triggers antibodies which attack the Basal Ganglia, and cause OCD syndrome
- Once Primed, future infections (strep or viral) can cause a recrudence of the PANDAS.
- The immune response may be under Genetic control

V. Discussion
Clinical & Research Implications

- The higher OCD rates in Hawaiian and non-Hawaiian youth suggest non-genetic, environmental, or epigenetic factors.

- Population of Hawaiian and Non-Hawaiian youth in Hawai‘i may offer unique research opportunity to determine the genetic, pathogenic, and environment causal factors of OCD. A model for studying the Bio-psycho-social factors of illness.

V. Discussion
Clinical & Research Implications

Study Limitations:

(1) Sample bias & generalizability.

- Weights addressed ethnic and 29 “at-risk” youth.
- No comparable SES measures
- State assessments of SES for Hawaiian, Japanese, Caucasian and Filipino suggest--

Filipino youth are Under-estimated

Japanese & Caucasian youth are Over-estimated

V. Discussion
Clinical & Research Implications

Study Limitations:

(2) DISC interviews only with Adolescents and not parents.

- Logistical and financial limits

- Older age group (9th - 12th grade) suggested a higher reliability for participants to accurately identify their symptoms and the level of dysfunction they experience when compared to their peers.

V. Discussion
Clinical & Research Implications

Children of Kauai Study (Werner et al, 1972, 1977)

- Prevalence rates in this study reflect findings in the Children of Kauai Study of whom 23% were Native Hawaiian.

- Four (4) predictors of mental illness by age 18:
  - Low SES
  - Congenital defects
  - Learning disabilities
  - No mental health services by age 10.

V. Discussion
Clinical & Research Implications

Children of Kauai Study (Werner et al, 1972, 1977)

- Determined four (4) correlates of improvement for troubled youth:
  - Perceived family and peer support
    - *Role of Mentors & Role Models?*
  - Belief in self-efficacy or an internal locus of control
  - Communication skills
  - Hard work and persistence.

What is the role of culture in these correlates?

Role of Culture and Psychopathology Among Indigenous Peoples

Andrade, Else, Wegner, Hishinuma et al. (2003) Hypotheses Culture Operationally defined as a—

- Discriminating descriptor (e.g., HCS) is a Risk factor
  - *Culture is set of unique value orientations & beliefs shared across a population*
- Process (e.g. structural equation models of analyses) is a Mediating or Resilience factor
  - *Culture as a process reflecting prevalent social dynamics (Kirmayer, 1991, 1993; Lewis-Fernandez & Kleinman, 1995)*
- Cognitive-behavioral intervention effects neuronal pathways is a neuro-biological factor

Role of Culture and Psychopathology Among Indigenous Peoples

Andrade, Else, Wegner, Hishinuma et al (2003) Hypothesis…

Crucial Role of Culture may be —

- How psychopathology is perceived (its meaning) and manifested (its experience or expression) within a society (e.g., Sociosomatics)

- How group rituals and patterns of behavior and their associated emotional responses may effect brain plasticity at the cell molecular level

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