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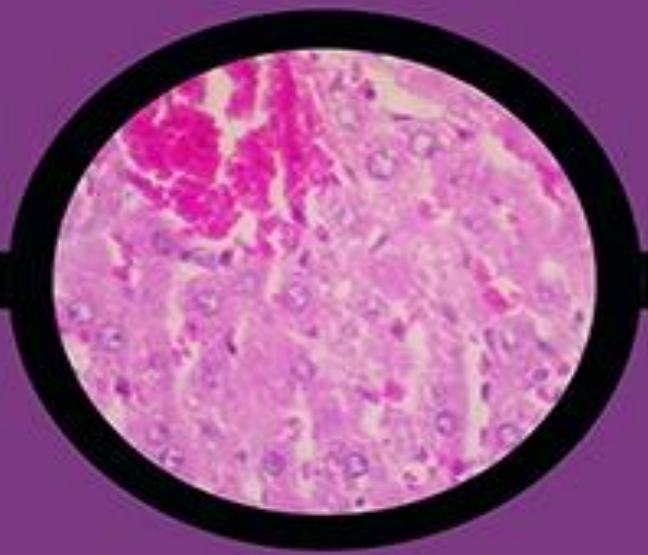

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Table of Contents

Articles

The social resilience of fishermen to oral diseases during the covid-19 pandemic in puger jember east java

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COVID-19 Pandemic; oral diseases; Puger fisherman; resilience

ABSTRACT

Background: *Puger fishermen are able to survive and develop (resilience) in carrying out their activities in the form of natural disturbances and various diseases, especially during the COVID-19 pandemic. Oral diseases are the lowest of the seven diseases recorded at the Puger Health Center. This disease can make patients exposed to COVID-19 worse, but the Puger area is included in the green zone. The Purpose of this study is to analyze the effect of knowledge, behavior and health services to the social resilience ability of Puger fishermen.*

Method: *It used a quantitative approach with the method of structural equation modelling (SEM). Confirmatory factor analysis tests and path analysis were conducted to analyze the effect among variables according to the research purpose. Questionnaires were distributed to fishermen who were sampled as respondents. Respondents amounted to 111 people. It used is simple random sampling.*

Result: *The knowledge has a positive effect, but it is not significant to social resilience with a significance level (β= 0.001 p: 0.314>0.05), behavior has a positive effect, but it is not significant to social resiliance with a significance level (β= 0.005 p: 0.649>0.05) and Health service has a positive effect, but it is not significant to social resilience with a significance level (β= 0.003 p: 0.218>0.05).*

Conclusion: *Puger Fishermen has social resilience ability to oral diseases underpinned by knowledge, behavior as well as health service. These variables have a positive correlation with resilience. Yet the level is not quite significant.*

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INTRODUCTION

Puger fishermen are not only able to survive on the complexities of challenges and various disturbances that interfere with carrying out their work, but also develop in number. In fact, they are the largest number in Jember Regency. Based on the Jember Central Statistics Agency in 2019, there are 10,676 people out of 12,493 fishermen in Jember.[1] Natural challenges in the form of high waves, big waves, heavy rain, extreme climate change seem to be an inseparable part of fishermen's lives.[2] They also actually face social culture pressures such as poverty problem as well as vulnerable to the spread of disease.[3] Puger Health Center data in the period 2019, 2020 and 2021, there are seven types of major diseases that are often examined by the Puger community. The most common types of disease are primary hypertension, other acute infections of the respiratory tract, acute bronchitis, other intestinal infections, gastritis and oral and dental disease. Oral disease occupies the smallest number, namely 1041 out of a total of 20058 cases. Types of oral diseases that are often examined include developmental and eruptive disorders of teeth and other dental hard tissue diseases. Oral disease actually can not only interfere with fishermen's activities, it can also exacerbate exposure to COVID-19.[4,5] In fact, the number of sufferers is quite low and the spread of COVID-19 in the Puger area is also included in the green zone.[6] It is quite encouraging. This condition at least gives an illustration that Puger fishermen have the ability of resilience to the spread of disease, especially oral diseases.

Resilience is defined as the ability of individuals or communities to face various changes, vulnerabilities and disturbances.[7,8,9,10] Disturbance variation is important in measuring the level of community resilience.[11] Adger (2000) complements the definition of resilience by unravelling the sources of pressure from outside the community and the occurrence of disturbances as a result of environmental, political and social changes.[12]

Some researchers have been conducted on the resilience of fishermen. These researches can at least be classified into three trends related to the type of disturbances. The first type of studies examines fishermen resilience to environmental changes.[13,14,15,16] The main issues discussed are various forms of resilience of fishermen to climate change. These authors believe that climate change greatly affects the activities of fishermen and causes the income of fishermen to be uncertain. In addition to environmental changes, fishermen also need to adjust to political changes, especially policies in marine resource management.

This theme inspires to do research related to the resilience of fishermen in the face of access to resources and changes in resource management policies.[17,18,19] Fishermen who cannot adapt to changes in the environment and policies have an impact on income uncertainty. This condition makes fishermen trapped in a cycle of poverty. Despite poor conditions, the fishermen are still trying to maintain their existence so that they can sustain their livelihood. Based on this social reality examine the resilience of fishermen to face economic limitations.[20,21,22] In fact, fishermen develop various ways by optimizing existing resources, including cooperation with fishermen's wife. Poor internal conditions create vulnerability in fishermen's lives. Vulnerability that is very influential in the sustainability of fishermen's livelihoods is exposure to disease. A study that correlates the resilience of fishermen to the spread of disease as an essential complement to the previous researches on fishermen' s resilience.

This study purposes to analyze the resilience of fishermen to oral diseases during the COVID-19

pandemic. Oral health status is closely related to the behaviour or habits of the community in maintaining oral health and also the condition of their drinking water.[23,24] In line with that idea, Kreps & Kunimoto (1994) stated that the significance and meaning of a disease depends on the perspective, values and beliefs of a person and the health services he receives.[25] Based on Mulayana and Ganiem (2021) expressed almost the same opinion. Their opinion is based on social construction theory that understanding of a disease is basically influenced by the culture of society.[25] The culture of one society can be different from other societies in interpreting a disease.[26] Based on these two opinions, there are two factors that influence how a person copes with the disease, namely internally behavior or habits and externally the services of local health institutions. The focus of this study is to analyze the significance of the influence of behavior or habits and the community health center program on the resilience of fishermen to oral diseases. The results of this study are expected to complement the resilience study with the fisherman's unit of analysis.

METHODS

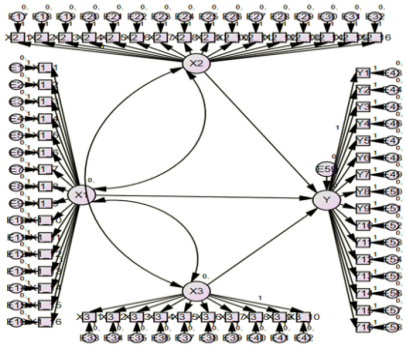
The research was conducted in Puger District, Jember Regency on September 1, 2020 to December 17, 2020. This place was chosen purposively because the number of fishermen is the most in Jember with the low number of dental and oral diseases during the pandemic. They can play an important role in supplying the largest fish needs in Jember.[3] Furthermore they indirectly protect the sovereignty of the nation in the sea because their activity is around Nusa Barong Island as the outermost point of the national boundary line (Presidential decree no. 06, 2017). The data collected in the study include primary data and secondary data. Primary data sources were obtained from respondents' answers to questionnaires. Secondary data were obtained from other parties such as Puger Health Center report books and relevant research results.

This study uses a survey method. Questionnaires were distributed to fishermen who were sampled as respondents. The list of questions was compiled based on research variables and indicators. Respondents were asked to fill out a questionnaire with clarification by the researcher. Measurement of respondents' answers using a Likert scale. The Linkert scale is organized into five levels of respondents' agreement with the statements made. This data is an ordinal scale because the statement has levels in each of the answer choices for questions. This scale is sequential and cannot be said to be equivalent. Consideration of applying this scale because it is easier to arrange, more organized and respondents can read easily how to use the scale.

The population in this study is fishermen in Puger District, Jember Regency. Population number was 10,676 people. The sample taken amounted to 111 respondents. The amount is taken according to Hair et al (2006) that the size of the sample size in the model that has fewer constructs or more than three variables observed the number of samples is 100. Referring to this opinion, the number of respondents taken is 111 as an anticipation if there are invalid data or missing data. Sampling technique by applying simple random sampling. Sampling is done randomly regardless of the existing strata in the population because it is considered homogeneous.[27,28]

The design of this research is basically a framework of relationships between several concepts to be observed or measured through research conducted using an approach or method, namely: structural equation modelling (SEM)

method by conducting confirmatory factor analysis and path analysis.



Source: designed model by SPSS 18 for SEM

Figure 1. Research Conceptual Framework

Based on the conceptual framework in figure 1, a hypothesis can be taken that there is a significant influence of knowledge on the social resilience of fishermen in dealing with oral diseases, a significant effect of behavior on the social resilience of fishermen in dealing with oral and dental diseases and a significant effect of health service on social resilience of fishermen in dealing with oral diseases.

Variable operational consists of exogenous and endogenous. The exogenous variables used in this study are knowledge (X1) which has 16 indicators, behavior (X2) has 16 indicators and health service (X3) has 10 indicators. the endogenous variable is resilience (Y). Endogenous variables developed various indicators using Connor and Davidson Scale (CD-RISC) as follows personal competence, high standards and tenacity (Y1), trust in one's instincts, tolerance of negative affect, and strengthening the effect of stress (Y2), positive acceptance of change and a secure relationship (Y3), control (Y4) and spirituality (Y5).[28]

Data was collected through collecting respondents' answers from the variables used in this study. The average value of respondents' answers on each statement item is done by adding up the value of the answers divided by each number of items or indicators in each variable. The class interval is 0,8. Based on the class interval, mean category of independent and dependent variables consist of 1,00 < a ≤ 1,80 (strongly disagree), 1,81 < a ≤ 2,60 (disagree), 2,61 < a ≤ 3,40 (doubtful), 3,41 < a ≤ 4,20 (agree) and 4,21 < a ≤ 5,0 (Strongly agree).

RESULTS

The research analysis was carried out by descriptive analysis and statistical analysis. Descriptive analysis describes descriptively the results of research in the field, especially those related to research respondents. The characteristics of respondent is most of the respondents' ages ranged from 31 to 40 years, see Figure 2. Experience as a fisherman with an average age range of almost 20 years. The educational background of most of the respondents only graduated from Elementary School (SD), see Figure 3.

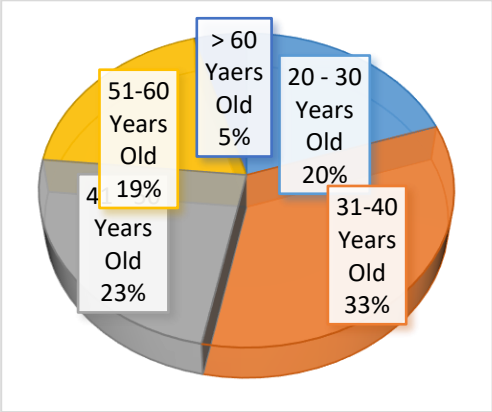
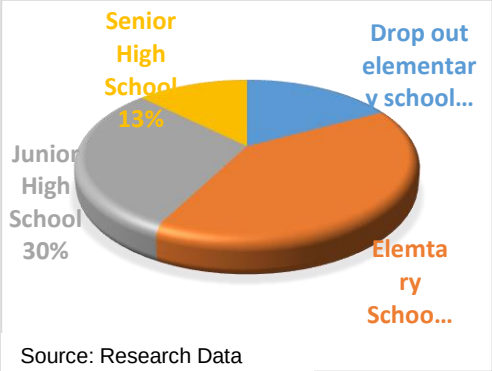


Figure 2. Average Age of Respondents



Source: Research Data

Figure 3. Educational Background of Respondents

Table 1. Case Report of Oral Disease

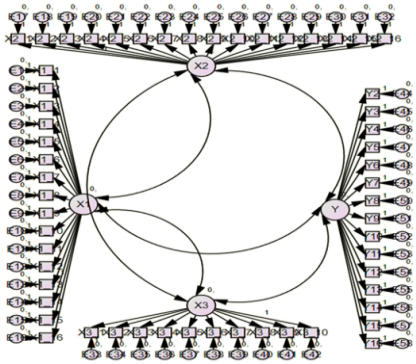
No	Types of diseases	2019	2020	2021	Total
1.	Impaired tooth growth and eruption	756	472	449	1677
2.	Embedded and Implanted Teeth	12	8	14	34
3.	Dental caries	92	43	39	174
4.	Other Hard Tissue Diseases	23	17	13	53
5.	Pulp and Periapical Tissue Disease	429	293	244	966
6.	Gingivitis and Periodontal Disease	342	197	163	702
7.	Gingival Enlargement	11	37	20	68
8.	Anomaly Dentofasial	4	14	17	35
9.	Disorders of the Teeth and Other Supporting Tissues	63	17	36	116
10.	Oral cavity cyst	1	0	0	1
11.	Other Jaw Disease	0	1	0	1
12.	Salivary Gland Disease	1	0	0	1
13.	Stomatitis and related lesions	17	5	17	39
14.	Angular Cheilitis	2	1	0	3
15.	Oral cavity cancer	1	0	0	1

Source: Puskesmas Puger 2022

There are 15 types of oral disease in Puger within 3 years from 2019 to 2021 in table 1. Based on table 1, the highest number of oral disease is impaired tooth growth and eruption. The number of disease actually relate to knowledge, behavior and health service as previous paragraph. These aspects are also correlation with their resilience ability. How significant effect on these aspects is analyzed by statistical. Statistical analysis is used to answer the problems that exist in the study with SEM analysis. It has tested the classical assumptions in accordance with several assumptions that must be met in the SEM equation. The first step is assuming the number of samples. The sample is one hundred and eleven (111) respondents. According to Hair, The minimum sample for SEM testing is 100 samples, so this has met the required minimum number of samples.[28]

The second step is a normality test. Based on the calculation of the Skewness and CR values, there is one research construct, namely Y1 has a skewness value greater than ±1 and a critical ratio greater than ± 2.58 so that the data on these variables are generally not normally distributed, because there is only one variable and if the variable is omitted but does not affect the research, then the variable is not included / omitted in the next process.

The third step is the outlier test. After seeing the normal distribution of the data, then the outlier values will be tested by means of multivariate outliers on the Confirmatory factor analysis (CFA) model using software application SPSS 18 for SEM, validity test model in figure 4.

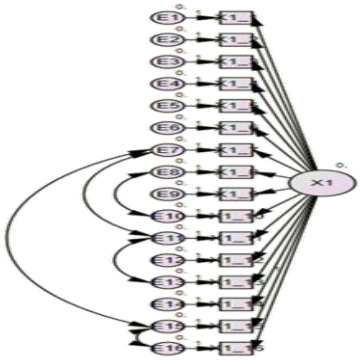


Source: designed model by SPSS 18 for SEM
Figure 4. Model Validity Test

Evaluation of multivariate outliers is carried out by looking at the Mahalanobis distance. From the results of the study, it is known that the cut of value is X2 (58; 0.01) = 88.38, which means that the value that appears above this number indicates the presence of outliers in the data. From the calculations in the table, it is known that there are 5 respondents who are outliers, namely the 13th, 33rd,

35th, 72nd and 75th samples so that the data is disposed.

The forth step is a test of validity and reliability. This test was conducted to see which questions were appropriate to be used to represent the latent variables in this study. The validity test is intended to determine whether the questions in the questionnaire are representative enough. This is done by using confirmatory factor analysis on each latent variable.

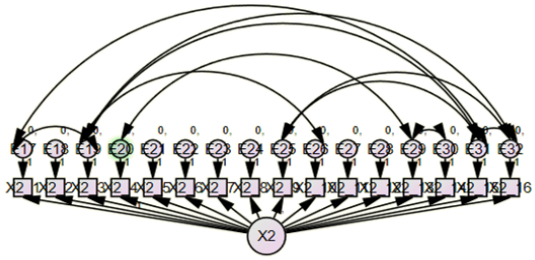


Source: designed model by SPSS 18 for SEM
Figure 5. Modification of the Model X1 Index

Table 2. X1 Index Modification Results

Index	Initial Model		
	Conformity	Result	Remark
Prob Chi²/df	>0.05	2.829	Good
NFI	>0.9	0.838	Quite Good
RFI	>0.9	0.867	Quite Good
IFI	>0.9	0.909	Good
TLI	>0.9	0.839	Quite Good
CFI	>0.9	0.900	Good

The test results as presented in Figure show that the magnitude of the loading factor value on the sixteen indicators can be explained that there are indicators X1_2 and X1_6 that are not valid with P-Value values above 0.05. Thus the indicator is not used in the model.



Source: designed model by SPSS 18 for SEM
Figure 6. Modification Index X2 Model

Table 3. X2 Index Modification Results

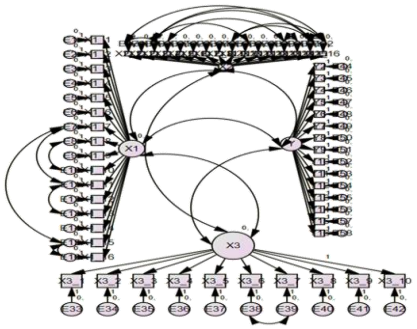
Index	Initial Model		
	Conformity	Result	Remark
Prob Chi²/df	>0.05	2.829	Good
NFI	>0.9	0.805	Quite Good
RFI	>0.9	0.895	Quite Good
IFI	>0.9	0.874	Quite Good
TLI	>0.9	0.870	Quite Good
CFI	>0.9	0.863	Quite Good

The test results as presented in Figure show that the magnitude of the loading factor value on the sixteen indicators can be explained that there are indicators X2_9, X2_15 and X2_16 that are not valid with P-Value values above 0.05. Thus the indicator is not used in the model. The next step is to do a reliability test. Calculation results in table 4.

Table 4. Reliability Statistics

Cronbach's Alpha	N of Items
.836	58

Dealing with the table above, it turns out that the latent environmental variable gives a CR value of 0.836 above its cut-off value of 0.6 so that it can be said that the indicators are reliable. The fifth step is to test the CFA model of the relationship between knowledge, behavior and health service with resilience. The confirmatory test in this study was carried out by applying it to all models.

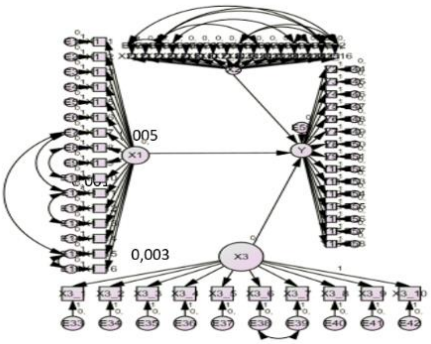


Source: designed model by SPSS 18 for SEM
Figure 7. CFA Initial model

Table 5. CFA Initial Model

Index	Initial Model		
	Conformity	Result	Remark
Prob Chi^2/df	>0.05	1,781	Good
NFI	>0.9	0.919	Good
RFI	>0.9	0.885	Quite Good
IFI	>0.9	0.963	Good
TLI	>0.9	0.946	Good
CFI	>0.9	0.962	Good

The sixth step is the path analysis hypothesis test. Testing the research hypotheses and investigating the effect of Knowledge, Behavior and Health Service on Resilience, carried out a structural model analysis test.



Source: designed model by SPSS 18 for SEM
Figure 8. The results of the overall path analysis of the research model

Table 6. Evaluation Criteria Goodness Of-Fit

Index	Initial Model		
	Conformity	Result	Remark
Prob Chi^2/df	>0.05	1,943	Good
NFI	>0.9	0.901	Good
RFI	>0.9	0.874	Quite Good
IFI	>0.9	0.949	Good
TLI	>0.9	0.934	Good
CFI	>0.9	0.949	Good

Remark
Chi Square Statistik (x^2)
Normed Fit Index (NFI)
Relative fit Index (RFI)
Incremental Fit Index (IFI)
Tucker Lewis Index (TLI)
Comparative Fit Index (CFI)

Table 7. Path Analysis Test Results

			Estimate	S.E.	C.R.	P
SOCIAL RESILIANCE	<---	BEHAVIOR	0.005	0.011	0.455	0.649
SOCIAL RESILIANCE	<---	HEALTH	0.003	0.002	1.232	0.218
SOCIAL RESILIANCE	<---	KNOWLEDGE	0.001	0.008	-1.007	0.314

Source: SPSS 18 calculation result for SEM

The symbol of < --- means variable X (behaviour, health, knowledge) influence to variable Y (social resilience). It will figure out in discussion part.

DISCUSSION

Based on the result of path analysis test in table 7, it is known that the results of hypothesis testing from each construct are as follows; the first variable is knowledge. Knowledge has a positive effect, but it is not significant to social resilience with a significance level (β= 0.001 p: 0.314>0.05). The research used 16 questions that consist of dental and oral health affects other body health conditions, causes of cavities, prevent cavities, minimal tooth brushing, age-appropriate toothbrush, a toothbrush with good bristles, change your toothbrush

regularly, toothbrush exchange, foods that cause toothache, smoking habit, take vitamins, cavities are not contagious, toothpicks damage teeth, healthy teeth criteria, take care of teeth and the impact of not brushing teeth. Total their answer was in in the range between 3.4 up to 3,8. It means that they have a quite good knowledge about oral and dental health. Meanwhile there are two questions that are the lowest score namely always change toothbrush periodically and exchange toothbrush. Some of them normally exchange toothbrush notably among their family. For this reason, they change toothbrush depend on its condition. They acknowledge that they did not change regularly. It makes them vulnerable to get infected diseases with one another. Tooth brush can get contamined by microorganisms in the oral cavity. Retention and survival of microorganisms on tooth brush after brushing represents a possible cause of recontamination of the mouth. This condition can cause either transmit diseases around the oral cavity such as gingivitis & periodontitis or systemic diseases such as heart disease endocarditis, arthritis, bacteraemia and stroke.[30] It is essential to educated them in order to change their bad habit.

The second variable is behavior. The Behavior has a positive effect, but it is not significant to social resiliance with a significance level (β= 0.005 p: 0.649>0.05). This variable is broken down into 16 questions. They are cavities must be filled, no eat too much sweet, dental health check to the dentist regularly, brushing teeth slowly, toothbrushes need to be changed regularly, brush teeth every day before going to bed, brushing teeth should be done with gentle, brushing all over the tooth surface, no eat too hard food, no eat too hot food, using toothpaste, visit the dentist to fill cavities, visit the dentist when toothache, drinking water used every day from PDAM and or buying packaging and eat fish every day. Total score is in the range between 3.4 up to 4.0, it means their behavior is good enough to keep their oral and dental healthy. They almost eat fish every day. It is good for dental heath since the fish contains Omega 3, Calcium and vitamin D. Omega 3 enhances bone formation process, osteoblast differentiation and decrease the proinflammatory cytokines. Calcium can increase enamel and bone density. Vitamin D maintains levels of calcium and phosphorus in the blood that influence the homeostasis.[31] Nutrition has an important role to support a person's health. Vitamin and mineral deficiencies can increase the risk of greater morbidity and mortality. Therefore, a person needs to maintain a healthy and balanced diet to maintain immunity during the COVID-19 pandemic.[32] Other good behavior shown by Puger's fishermen drink the PDAM water daily. They are not drinking the well water that contains high salt because its location is near to the sea. The well water can contain high fluoride, phosphor and calcium that triggers plaques and calculus formation. Plaques undergoing remineralization and becoming rigid can cause periodontal diseases.[33] Dental care and regular dental visits were claimed to be an effective strategy to prevent the diseases either oral or systemic diseases. Patient's awareness of oral health issues was found to be a strong factor for reducing carries, especially for children.[4,34]

The third variable is health service. Health service has a positive effect, but it is not significant to social resilience with a significance level (β= 0.003 p: 0.218>0.05). This variable comprises of ten questions. The questions are health workers are always ready, come on time, courteus in service, profesional, well equipment, referred to the hospital if it can not be resolved, give good advice, easy to access and need national health insurance card. The average of total score is in good category (4.00-4.20). Respondent is aware how important to have

national health insurance. These variables underpin and correlate with social resilience. Respondents answered quite positively to the question of maintaining good relations and willing to help each other. The answer at least illustrates a sense of solidarity and mutual assistance to cope with difficulties. The interaction and integrity have been shown by the Puger fishermen community in dealing with various disturbances, showing the ability of social resilience. This is in line with the notion of social resilience offered.[12]

Knowledge and healthy behavior can reduce the risk of oral diseases related to the behavior of coastal communities, so they can increase their life productivity.[35,36] Puger Fishermen community basically has resilience ability to minimize the negative excesses of the spread of oral and dental disease during the COVID-19 pandemic. According to the answer of the questionaires, they have a quite good knowledge and behavior to prevent this disease. They also think that Puger health service is good. The results of the SEM analysis on each variable showed that knowledge, behavior and health service have a positive correlation with social resilience, but the level is not significant. Another variable not included in this study is heredity. This is in line with HL Blum's theory that health status is determined based on 40% of environmental factors, 30% of behavioral factors, 20% of health care factors and 10% of heredity factors.[31] Further research needs to be done by including genetic variables.

CONCLUSION

Puger Fishermen has social resilience ability to oral diseases underpinned by knowledge, behavior as well as health service. These variables have a positive correlation with resilience. Yet the level is not quite significant. A significance level need to be strengthened by integrated program among local institutions that close coordination with religious leaders as well as community leaders.

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