Factors affecting the family development index in Indonesia: a cross-sectional survey in Aceh, a region with a 30 year armed conflict experience [version 1; peer review: awaiting peer review]

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Abstract

Background: Family development index needs to be measured to ensure that the government has made optimal efforts to provide happiness to the families and to develop strategies in family development in a region with unique conditions. The objective of this study was to assess the family development index and its associated determinants in Aceh province, a region implementing Syariah Law in Indonesia with 30 years of armed conflict experience.

Methods: A cross-sectional survey was conducted in all regencies in Aceh. The study was a part of the Indonesian National Population and Family Planning Board project. The survey included one individual from each household that was selected randomly. Family development index was measured using a questionnaire consisting of 15 questions. The plausible determinants were collected and assessed through a face-to-face interview. The family development index was dichotomized using 85% cut-off into good and poor. A two-step logistic regression was used to determine the associated determinants.

Results: A total of 10,000 households were included in the final
analysis. 86.6% had a good family development index, with the highest in Sabang (97.6%) and the lowest index in Aceh Singkil (76.6%), respectively. A multivariate analysis indicated that the regency, marital status, educational qualification, ownership of health insurance, ownership of childbirth certificate, quality of the house (the type of floor, the source of electricity, the source of drinking water and the type of toilet facility) were associated with the family development index.

**Conclusion:** Despite Aceh being one of the less developed provinces in Indonesia with long armed conflict experience, our data suggest that the family development index is relatively high and the index is influenced both by economic and non-economic determinants. To further improve the family development index, it is critical to develop both economic and non-economic components in the region and in the country.

**Keywords**
Family development index, family quality, conflict area, Aceh, Indonesia
1. Introduction

Family is an essential determinant that defines a nation and is also critical as a channel for the continuation of culture in a society. The characteristics of a family need to be measured using a good and comprehensive index to provide information on how to improve the quality of families in the future by designing and implementing suitable strategies and approaches. Family development indexes that measure the welfare of the family have been used in some countries, for example in Brazil and the United States. Those indexes help in enhancing the quality of life of the families by producing information for the authorities and highlighting the needs based on the problems reflected through the indicators. However, there are no family development indexes available in the Asian countries.

In Indonesia, some government organizations are responsible to ensure quality life for families and one of them is the National Population and Family Planning Board (in Indonesian it is called, Badan Kependudukan dan Keluarga Berencana Nasional). The National Population and Family Planning Board defines characteristics of a good quality family as independence, peace and happiness. Therefore, a validated questionnaire based on those three components has been developed to assess the family development index in Indonesia. The Indonesian version of family development index is expected to: (a) classify the family development status from a very diverse regions in Indonesian archipelago; (b) measure the success of family development in each province; and (c) identify the family problems in particular region in Indonesia. This information is critical for formulating the policies and programs needed by families in certain areas according to the local problems.

One of the unique regions in Indonesia is Aceh province, the western most part of Indonesian archipelago located in the Sumatra Island. Aceh is the only province in Indonesia implementing Islamic Shariah law. The region had 30 years of armed conflict between Free Aceh Movement (known as Gerakan Aceh Merdeka (FAM) and Indonesian Army between 1970-2005 with significant economic impacts. Aceh is continuously listed as a underdeveloped province in the country with 15.5% of the population below the poverty-line in 2021. This study aimed to assess the development index of the families in Aceh and to determine the possible determinants associated with the family development index.

2. Methods

2.1 Study setting

This study was a part of nationwide cross-sectional survey conducted by the National Population and Family Planning Board of Indonesia. The survey in Aceh was concluded in all 23 regencies between 30 April and 30 June 2021. In 2021, the total population of Aceh was 5.33 million. Face-to-face interviews were conducted to collect the data in selected households. One of the family members from each household was selected randomly. All individuals provided written informed consent and no incentive was offered in the survey.

2.2 Study instrument and variables

The dependent variable of the study was family development index, which was measured using a questionnaire consisting of 15 questions. The questions covered three components of the family quality: peace, independence and happiness. For each question, a favorable response (i.e., indicating good quality) was provided a score of one while unfavorable response (i.e., indicating poor quality) was scored zero. Therefore, the scores ranged from 0 to 15. For statistical purpose, the family development index was categorized as poor and good based on an 85% cut-off. A household with a score less than 85% of the maximum score (i.e., 15) was categorized as poor family development index.

Several plausible independent variables were collected and assessed in the survey including regencies, age, marital status, educational qualification, type of health insurance, birth certificate ownership and role in the family. In addition, the condition of the house including the roof, wall, floor, source of electricity, source of drinking water and toilet facility were also assessed by direct observation during the interviews. Age was divided into five groups (<20, 20–29, 30–39, 40–49 and ≥50-year-old); marital status consisted of three groups (single, married and divorced); educational qualification of the respondents was classified into ten groups while the health insurance was divided into three groups: (1) the Indonesian National Health Insurance System – Beneficiary Contribution/Community Health Insurance/Locals Health Insurance; (2) the Indonesian National Health Insurance System – Non-Beneficiary Contribution; and (3) others. The role in the family was categorized into two groups: head of the family and wife or children. The house materials were assessed based on three main components: roof, wall and floor. The grouping system of the materials was based on country context in Indonesia i.e., which material is better compared to others. For example, a wall made from brick is better than wood, and a wood wall is better than the one made from bamboo. The main source of electricity was classified into three types: private electricity > 900 Watt, private electricity ≤ 900 Watt and shared, or had no electricity. The source of drinking water was classified into six groups: bottled water/refill, tap/plumbing, bore well, protected well, unprotected well, and natural such as river or rain. The toilet facility owned by the households was classified into four groups: private with septic tank, private without septic tank, communal toilet, and others.
2.3 Data analysis
To assess the associated determinants with family development index, a two-step logistic regression analysis was performed. In the first step, all plausible determinants were analyzed separately in the univariate analyses. In the next step, determinants with at least one significant category (p < 0.05) in univariate analyses were included into multivariate analysis. The crude odd ratios (ORs) of univariate analyses and adjusted ORs (aORs) of multivariate analysis and their 95% confidence intervals (CIs) were calculated. The interpretation of OR and aOR for each category was compared to a reference group (R) for each variable. All analyses were performed using SPSS software (SPSS Inc., Chicago, IL, USA).

3. Results
3.1 Characteristics of respondents
A total of 10,000 respondents were selected randomly for analysis in this study and their characteristics are presented in Table 1. The highest percentage of the respondents was from North Aceh (1,029 respondents; 10.3%). The mean age of respondents was 25.8 ± 17.5 years old; mostly under 20 years old (43.1%) followed by 30–39 years old (17.5%). Approximately 53% of respondents were unmarried. The highest percentage of respondents' educational qualifications

| Variable                  | n   | %       |
|---------------------------|-----|---------|
| Regencies                 |     |         |
| Great Aceh                | 857 | 8.6     |
| Pidie                     | 795 | 8.0     |
| North Aceh                | 1029| 10.3    |
| East Aceh Timur           | 801 | 8.0     |
| Central Aceh              | 463 | 4.6     |
| West Aceh                 | 407 | 4.1     |
| South Aceh                | 445 | 4.5     |
| Southeast Aceh            | 358 | 3.6     |
| Banda Aceh                | 483 | 4.8     |
| Sabang                    | 83  | 0.8     |
| Aceh Singkil              | 231 | 2.3     |
| Simeulue                  | 178 | 1.8     |
| Bireuen                   | 793 | 7.9     |
| Lhokseumawe               | 349 | 3.5     |
| Langsa                    | 301 | 3.0     |
| Southwest Aceh            | 308 | 3.1     |
| Gayo Lues                 | 180 | 1.8     |
| Aceh Jaya                 | 199 | 2.0     |
| Nagan Raya                | 326 | 3.3     |
| Aceh Tamiang              | 572 | 5.7     |
| Bener Meriah              | 329 | 3.3     |
| Subulussalam              | 222 | 2.2     |
| Pidie Jaya                | 291 | 2.9     |
| Age group (years) (mean ± SD) |     |         |
| <20                       | 4305| 43.1    |
| 20–29                     | 1524| 15.2    |
| 30–39                     | 1749| 17.5    |
| 40–49                     | 1378| 13.8    |
| ≥50                       | 1044| 10.4    |
| Variable                                      | n    | %    |
|----------------------------------------------|------|------|
| **Marital status**                           |      |      |
| Single                                       | 5383 | 53.8 |
| Married                                      | 4596 | 46.0 |
| Divorced                                     | 21   | 0.2  |
| **Educational qualification**                |      |      |
| Never went to school                         | 1688 | 16.9 |
| Did not finish elementary school             | 186  | 1.9  |
| Still elementary school                      | 1353 | 13.5 |
| Graduated from elementary school             | 1194 | 11.9 |
| Still junior high school                     | 540  | 5.4  |
| Graduated from junior high school            | 1192 | 11.9 |
| Still senior high school                     | 370  | 3.7  |
| Graduated from senior high school            | 2414 | 24.1 |
| Still in college                             | 225  | 2.3  |
| Graduated from a college                     | 838  | 8.4  |
| **Type of health insurance**                 |      |      |
| National Health Insurance (beneficiary contribution (BC)) or local public insurance | 8275 | 82.8 |
| National Health Insurance (non-BC)           | 1553 | 15.5 |
| Private insurance company or none            | 172  | 1.7  |
| **Have birth certificate**                   |      |      |
| Yes                                          | 7579 | 75.8 |
| No                                           | 2421 | 24.2 |
| **Role in family**                           |      |      |
| Head of family                               | 2265 | 22.7 |
| Others (e.g., wife, children)                | 7735 | 77.4 |
| **Type of house roof**                       |      |      |
| Concrete                                     | 313  | 3.1  |
| Roof tile                                    | 519  | 5.2  |
| Asbestos/zinc                                | 8984 | 89.8 |
| Others (e.g., wood, shingle, bamboo, thatch, coconut leave, sugar palm leave) | 184  | 1.8  |
| **Type of house wall**                       |      |      |
| Brick wall                                   | 5943 | 59.4 |
| Wood                                         | 3917 | 39.2 |
| Others (e.g., zinc, bamboo)                  | 140  | 1.4  |
| **Type of house floor**                      |      |      |
| Ceramic/granite/marble/tiles/terraso         | 3127 | 31.3 |
| Cement                                       | 6172 | 61.7 |
| Wood                                         | 474  | 4.7  |
| Others (e.g., bamboo, soil)                  | 227  | 2.3  |
| **Main source of electricity**               |      |      |
| Private (≤900 Watt)                          | 6909 | 69.1 |
| Private (>900 Watt)                          | 2347 | 23.5 |
| Shared electricity, no electricity           | 744  | 7.4  |
was senior high school (24.1%) and had no education (16.9%); only 10.7% of the respondents had studied at universities or had a university degree. There were 75.8% of respondents who had a birth certificate and vast majority of the respondents had Indonesian national health insurance or state health insurance (98.3%).

The quality of the house was assessed through the materials used to build the houses and a vast majority (89.8%) of the respondents had a house with roofs made from zinc and 59.4% had a house with walls made from brick. A total of 2.6% of respondents had their source of drinking water from unprotected wells and 7.3% of respondents used communal toilets.

3.2 Distribution of respondents’ responses on family development index questions

Detailed responses from the respondents on 15 questions/statements of family development index are presented in Table 2. Out of the total respondents, 98.6% respondents responded “yes” for the statement “each family member (≥10-year-old) has performed worship regularly in accordance with the religious guidance or beliefs held”; 97.0% respondents responded “yes” for the statement “child care had been carried out jointly by husband and wife” and “each family member ate various foods at least two times a day during the last six months” and 96.9% responded they had a legal marriage book/certificate. Meanwhile, the question that stated “there have been conflicts between family members” had the highest percentage of “no” response with all more than 98%. Only 72.8% of the respondents stated they had savings such as cash, jewellery or livestock, which can be used at any time to fulfill basic needs in the next 3 months.

Table 1. Continued

| Variable                                      | n   | %   |
|-----------------------------------------------|-----|-----|
| Main source of drinking water                 |     |     |
| Bottled water/refill                          | 4235| 42.4|
| Tap/plumbing                                 | 1375| 13.8|
| Bore wells                                    | 824 | 8.2 |
| Protected well                                | 2767| 27.7|
| Unprotected well                              | 264 | 2.6 |
| Nature or others (e.g., river, lake, rain)    | 535 | 5.4 |
| Toilet/latrine facilities                     |     |     |
| Private with septic tank                      | 8491| 84.9|
| Private without septic tank                   | 564 | 5.6 |
| Shared/public toilet                          | 733 | 7.3 |
| Others                                        | 212 | 2.1 |

Table 2. Distribution of responses for each question of family development index questionnaire (n=10,000).

| No | Question                                                                 | Yes n | %   | No n | %   |
|----|--------------------------------------------------------------------------|-------|-----|------|-----|
| Q1 | During the last six months, each family member (≥10 years old) has performed worship regularly in accordance with the religious guidance or beliefs held | 9863  | 98.6| 137  | 1.4 |
| Q2 | The family has a marriage certificate which is legalized by the authorized official | 9685  | 96.9| 315  | 3.2 |
| Q3 | During the last six months, there have been conflicts between family members with no reprimand (for three consecutive days) | 169   | 1.7 | 9831 | 98.3|
| Q4 | During the last six months, there have been conflicts between family members with separated bed between husband and wife (for seven consecutive days) | 77    | 0.8 | 9923 | 99.2|
| Q5 | During the last six months, there have been conflicts between family members with run away from home (for two consecutive days) | 76    | 0.8 | 9924 | 99.2|
| Q6 | During the last six months, there have been conflicts between family members with domestic violence | 51    | 0.5 | 9949 | 99.5|
3.3 Family development index and factors associated in Aceh

Our data indicated that 86.6% (8,662/10,000) of the total respondents had good family development index. Based on the regency, the highest frequency of respondents with poor family development index was in Aceh Singkil (23.4%), followed by those in Aceh Jaya (22.6%) and North Aceh (21.1%). Based on respondents’ characteristics, those who lived in a house with the roofs made from wood, shingle, bamboo, thatch, coconut leaves or sugar palm leaves had the highest percentage of poor family development index (29.3%), followed by those who used unprotected wells as their main source of drinking water (28.8%), divorced respondents (28.6%), those who lived in a house with the floor made from bamboo or soil (27.8%) and the ones who did not have health insurance (27.3%) (Table 3).

### Table 2. Continued

| No | Question                                                                 | Yes |  | No |  |
|----|---------------------------------------------------------------------------|-----|---|----|---|
| Q7 | During the last six months, there has been at least one family member who has a source of income to fulfill basic needs per month | 9412 | 94.1 | 588 | 5.9 |
| Q8 | During the last six months, each family member ate “various foods” (staple foods, vegetables/fruits and side dishes) at least two times a day | 9696 | 97.0 | 304 | 3.0 |
| Q9 | The family has savings (cash, jewellery, livestock, garden products, etc.) which can be used at any time to fulfill basic needs in the next three months | 7276 | 72.8 | 2724 | 27.2 |
| Q10 | During the last one month, there is a family member who is sick (four consecutive days) which causes him to leave certain activity, or there is a family member with disability | 1328 | 13.3 | 8672 | 86.7 |
| Q11 | During the last six months, there has been at least one family member accessing information from online media (internet). | 8360 | 83.6 | 1640 | 16.4 |
| Q12 | During the last six months, each family member has had time to interact every day | 9525 | 95.3 | 475 | 4.8 |
| Q13 | During the last six months, child care has been carried out jointly by husband and wife | 9698 | 97.0 | 302 | 3.0 |
| Q14 | During the last six months, the family had outdoor activities together | 8152 | 81.5 | 1848 | 18.5 |
| Q15 | During the last six months, the family has participated in social/mutual activities in a neighbourhood | 9097 | 91.0 | 903 | 9.0 |

### Table 3. Distribution of family development index (good and poor) based on the respondents’ characteristics.

| Characteristics | n  | %  | Good N (%) | Poor N (%) |
|-----------------|----|----|------------|------------|
| Regencies       |    |    |            |            |
| Great Aceh      | 857| 8.6| 803 (93.7) | 54 (6.3)   |
| Pidie           | 795| 8.0| 663 (83.4) | 132 (16.6) |
| North Aceh      | 1029| 10.3| 812 (78.9) | 217 (21.1) |
| East Aceh Timur | 801| 8.0| 687 (85.8) | 114 (14.2) |
| Central Aceh    | 463| 4.6| 414 (89.4) | 49 (10.6)  |
| West Aceh       | 407| 4.1| 363 (89.2) | 44 (10.8)  |
| South Aceh      | 445| 4.5| 397 (89.2) | 48 (10.8)  |
| Southeast Aceh  | 358| 3.6| 280 (78.2) | 78 (21.8)  |
| Banda Aceh      | 483| 4.8| 456 (94.4) | 27 (5.6)   |
| Sabang          | 83 | 0.8| 81 (97.6)  | 2 (2.4)    |
| Aceh Singkil    | 231| 2.3| 177 (76.6) | 54 (23.4)  |
| Simeulue        | 178| 1.8| 153 (86.0) | 25 (14.0)  |
| Bireuen         | 793| 7.9| 671 (84.6) | 122 (15.4) |
| Characteristics                          | n    | %    | Good N (%) | Poor N (%) |
|-----------------------------------------|------|------|------------|------------|
| Lhokseumawe                             | 349  | 3.5  | 311 (89.1) | 38 (10.9)  |
| Langsa                                  | 301  | 3.0  | 269 (89.4) | 32 (10.6)  |
| Southwest Aceh                          | 308  | 3.1  | 279 (90.6) | 29 (9.4)   |
| Gayo Lues                               | 180  | 1.8  | 155 (86.1) | 25 (13.9)  |
| Aceh Jaya                               | 199  | 2.0  | 154 (77.4) | 45 (22.6)  |
| Nagan Raya                              | 326  | 3.3  | 274 (84.0) | 52 (16.0)  |
| Aceh Tamiang                            | 572  | 5.7  | 500 (87.4) | 72 (12.6)  |
| Bener Meriah                            | 329  | 3.3  | 305 (92.7) | 24 (7.3)   |
| Subuluussalam                           | 222  | 2.2  | 198 (89.2) | 24 (10.8)  |
| Pidie Jaya                              | 291  | 2.9  | 260 (89.3) | 31 (10.7)  |
| Age group (years) (mean ± SD)           |      |      | 25.8 ± 17.5| 25.9 ± 17.5| 24.9 ± 17.4|
| <20                                     | 4305 | 43.1 | 3687 (85.6)| 618 (14.4) |
| 20–29                                   | 1524 | 15.2 | 1321 (86.7)| 203 (13.3) |
| 30–39                                   | 1749 | 17.5 | 1531 (87.5)| 218 (12.5) |
| 40–49                                   | 1378 | 13.8 | 1219 (88.5)| 159 (11.5) |
| ≥50 (R)                                 | 1044 | 10.4 | 904 (86.6) | 140 (13.4) |
| Marital status                          |      |      |            |            |
| Single                                  | 5383 | 53.8 | 4613 (85.7)| 770 (14.3) |
| Married                                 | 4596 | 46.0 | 4034 (87.8)| 562 (12.2) |
| Divorced                                | 21   | 0.2  | 15 (71.4)  | 6 (28.6)   |
| Educational qualification               |      |      |            |            |
| Never went to school                    | 1688 | 16.9 | 1448 (85.8)| 240 (14.2) |
| Did not finish elementary school        | 186  | 1.9  | 141 (75.8) | 45 (24.2)  |
| Still elementary school                 | 1353 | 13.5 | 1164 (86.0)| 189 (14.0) |
| Graduated from elementary school        | 1194 | 11.9 | 975 (81.7) | 219 (18.3) |
| Still junior high school                | 540  | 5.4  | 454 (84.1) | 86 (15.9)  |
| Graduated from junior high school       | 1192 | 11.9 | 1011 (84.8)| 181 (15.2) |
| Still senior high school                | 370  | 3.7  | 326 (88.1) | 44 (11.9)  |
| Graduated from senior high school       | 2414 | 24.1 | 2145 (88.9)| 269 (11.1) |
| Still in college                        | 225  | 2.3  | 207 (92.0) | 18 (8.0)   |
| Graduated from a college                | 838  | 8.4  | 791 (94.4) | 47 (5.6)   |
| Health insurance participation          |      |      |            |            |
| National Health Insurance (beneficiary contribution (BC)) or local public insurance | 8275 | 82.8 | 7103 (85.8)| 1172 (14.2) |
| National Health Insurance (non-BC)      | 1553 | 15.5 | 1434 (92.3)| 119 (7.7)  |
| Private insurance company or none       | 172  | 1.7  | 125 (72.7) | 47 (27.3)  |
| Have birth certificate                  |      |      |            |            |
| Yes                                     | 7579 | 75.8 | 6669 (88.0)| 910 (12.0) |
| No                                      | 2421 | 24.2 | 1993 (82.3)| 428 (17.7) |
| Role in family                          |      |      |            |            |
| Head of family                          | 2265 | 22.7 | 1975 (87.2)| 290 (12.8) |
| Others (e.g., wife, children)           | 7735 | 77.4 | 6687 (86.5)| 1048 (13.5)|
Based on univariate analyses, regency, marital status, educational qualification, type of health insurance, birth certificate ownership, type of material of the roof, wall and floor, type of electricity source, source of drinking water, and type of toilet facility were associated with family development index in some degree (Table 4). Multivariate analysis found that only regency, marital status, educational qualification, type of health insurance, the ownership of birth certificate and the quality of the house (including the material type of the floor, the source of electricity, the source of drinking water and the type of the toilet facility) were associated with the family development index (Table 4).

Compared to residents from Banda Aceh, the capital of Aceh province, those from North Aceh, Southeast Aceh, Aceh Singkil, and Aceh Jaya had higher odds of having poor family development index significantly (aOR: 1.81; 1.96; 2.25; and 2.34, respectively) (Table 4). Multivariate analysis found that only regency, marital status, educational qualification, type of health insurance, the ownership of birth certificate and the quality of the house (including the material type of the floor, the source of electricity, the source of drinking water and the type of the toilet facility) were associated with the family development index (Table 4).

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| Variable | n | % Poor index (<85%) | Univariate analysis | Multivariate analysis | 95% CI | p-value | Adjusted OR | 95% CI | p-value |
|-----------|---|---------------------|---------------------|----------------------|-------|---------|-------------|-------|---------|
| Regencies |     |                     |                     |                      |       |         |             |       |         |
| Great Aceh | 857 | 11.4 | 0.71–1.183 | 0.216 | 0.45–1.20 | 0.045 | 0.71 | 0.45–1.20 | 0.045 |
| Pidie | 795 | 12.2 | 0.71–1.83 | 0.45 | 0.45–1.20 | 0.045 | 0.71 | 0.45–1.20 | 0.045 |
| North Aceh | 1029 | 11.5 | 0.71–1.83 | 0.45 | 0.45–1.20 | 0.045 | 0.71 | 0.45–1.20 | 0.045 |
| East Aceh Timur | 801 | 11.5 | 0.71–1.83 | 0.45 | 0.45–1.20 | 0.045 | 0.71 | 0.45–1.20 | 0.045 |
| Central Aceh | 463 | 11.2 | 0.71–1.83 | 0.45 | 0.45–1.20 | 0.045 | 0.71 | 0.45–1.20 | 0.045 |
| West Aceh | 407 | 11.2 | 0.71–1.83 | 0.45 | 0.45–1.20 | 0.045 | 0.71 | 0.45–1.20 | 0.045 |
| South Aceh | 358 | 11.2 | 0.71–1.83 | 0.45 | 0.45–1.20 | 0.045 | 0.71 | 0.45–1.20 | 0.045 |
| Southeast Aceh | 229 | 11.2 | 0.71–1.83 | 0.45 | 0.45–1.20 | 0.045 | 0.71 | 0.45–1.20 | 0.045 |
| Aceh Singkil | 83 | 11.2 | 0.71–1.83 | 0.45 | 0.45–1.20 | 0.045 | 0.71 | 0.45–1.20 | 0.045 |
| Aceh Jaya | 199 | 11.2 | 0.71–1.83 | 0.45 | 0.45–1.20 | 0.045 | 0.71 | 0.45–1.20 | 0.045 |
| Aceh Jaya | 199 | 11.2 | 0.71–1.83 | 0.45 | 0.45–1.20 | 0.045 | 0.71 | 0.45–1.20 | 0.045 |
| Aceh Jaya | 199 | 11.2 | 0.71–1.83 | 0.45 | 0.45–1.20 | 0.045 | 0.71 | 0.45–1.20 | 0.045 |
| Aceh Jaya | 199 | 11.2 | 0.71–1.83 | 0.45 | 0.45–1.20 | 0.045 | 0.71 | 0.45–1.20 | 0.045 |
| Aceh Jaya | 199 | 11.2 | 0.71–1.83 | 0.45 | 0.45–1.20 | 0.045 | 0.71 | 0.45–1.20 | 0.045 |
| Aceh Jaya | 199 | 11.2 | 0.71–1.83 | 0.45 | 0.45–1.20 | 0.045 | 0.71 | 0.45–1.20 | 0.045 |
Table 4. Continued

| Variable                       | n   | %     | Poor index (<85%) | Univariate analysis | Multivariate analysis |
|--------------------------------|-----|-------|-------------------|---------------------|-----------------------|
|                                |     |       | n                | %                | Crude OR | 95% CI | p-value | Adjusted OR | 95% CI | p-value |
| Age group (years)              |     |       |                  |                    | 95% CI   |        |         | 95% CI   |        |
| <20                            | 4305| 43.1  | 618              | 14.4              | 1.08     | 0.89–1.32 | 0.432 |
| 20–29                          | 1524| 15.2  | 203              | 13.3              | 0.99     | 0.79–1.25 | 0.948 |
| 30–39                          | 1749| 17.5  | 218              | 12.5              | 0.92     | 0.73–1.15 | 0.470 |
| 40–49                          | 1378| 13.8  | 159              | 11.5              | 0.84     | 0.66–1.07 | 0.166 |
| ≥50 (R)                        | 1044| 10.4  | 140              | 13.4              | 1        | 1        | 1       |
| Marital status                 |     |       |                  |                    |          |         |         | 95% CI   |        |
| Single                         | 5383| 53.8  | 770              | 14.3              | 0.42     | 0.16–1.08 | 0.071 |
| Married                        | 4596| 46.0  | 562              | 12.2              | 0.35     | 0.14–0.90 | 0.030 |
| Divorced (R)                   | 21  | 0.2   | 6                | 28.6              | 1        | 1        | 1       |
| Educational qualification      |     |       |                  |                    | 95% CI   |        |         | 95% CI   |        |
| Never went to school           | 1688| 16.9  | 240              | 14.2              | 2.79     | 2.02–3.86 | <0.001 |
| Did not finish elementary school| 186 | 1.9   | 45               | 24.2              | 5.37     | 3.44–8.39 | <0.001 |
| Still elementary school        | 1353| 13.5  | 189              | 14.0              | 2.73     | 1.96–3.81 | <0.001 |
| Graduated from elementary school| 1194| 11.9  | 219              | 18.3              | 3.78     | 2.72–5.25 | <0.001 |
| Still junior high school       | 540 | 5.4   | 86               | 15.9              | 3.19     | 2.19–4.63 | <0.001 |
| Graduated from junior high school| 1192| 11.9  | 181              | 15.2              | 3.01     | 2.16–4.21 | <0.001 |
| Still senior high school       | 370 | 3.7   | 44               | 11.9              | 2.27     | 1.48–3.50 | <0.001 |
| Graduated from senior high school| 2414| 24.1  | 269              | 11.1              | 2.11     | 1.53–2.91 | <0.001 |
| Still in college               | 225 | 2.3   | 18               | 8.0               | 1.46     | 0.83–2.57 | 0.186 |
| Graduated from a college       | 838 | 8.4   | 47               | 5.6               | 1        | 1        | 1       |
| Health insurance participation |     |       |                  |                    | 95% CI   |        |         | 95% CI   |        |
| National Health Insurance (beneficiary contribution (BC)) or local public insurance | 8275 | 82.8 | 1172 | 14.2 | 1 | 1 |
| National Health Insurance (non-BC) | 1553 | 15.5 | 119 | 7.7 | 0.50 | 0.41–0.61 | <0.001 |
| Private insurance company or none | 172 | 1.7 | 47 | 27.3 | 2.28 | 1.62–3.21 | <0.001 |
| Variable                              | n    | %  | Poor index (<85%) | Univariate analysis | Multivariate analysis |
|--------------------------------------|------|----|-------------------|---------------------|-----------------------|
|                                      | n    | %  |       |         |          | Adjusted OR | 95%CI       | p-value | Adjusted OR | 95%CI       | p-value |
|                                      | Crude OR | 95%CI | p-value |         |          |          |          |         |          |          |         |
| Have birth certificate               |      |    |       |         |          |          |          |         |          |          |         |
| Yes (R)                              | 7579 | 75.8 | 910   | 12.0    | 1        |          |          | <0.001  |          | 1.37      | <0.001  |
| No                                   | 2421 | 24.2 | 428   | 17.7    | 1.57     | 1.39–1.78 | <0.001  | 1.37    | 1.16–1.62 | <0.001  |
| Role in Family                       |      |    |       |         |          |          |          |         |          |          |         |
| Head of family                       | 2265 | 22.7 | 290   | 12.8    | 0.94     | 0.82–1.08 | 0.360   |         |          |          |         |
| Others (e.g., wife or children) (R)  | 7735 | 77.4 | 1048  | 13.5    | 1        |          |          |         |          |          |         |
| Type of house roof                   |      |    |       |         |          |          |          |         |          |          |         |
| Concrete (R)                         | 313  | 3.1 | 41    | 13.1    | 1        |          |          |         |          |          |         |
| Rooftile                             | 519  | 5.2 | 47    | 9.1     | 0.66     | 0.42–1.03 | 0.068   | 0.68    | 0.43–1.08 | 0.105   |
| Asbestos/Zinc                        | 8984 | 89.8| 1196  | 13.3    | 1.02     | 0.73–1.42 | 0.913   | 0.72    | 0.51–1.03 | 0.069   |
| Others (e.g., wood, shingle, bamboo, thatch, coconut leave, sugar palm leave) | 184  | 1.8 | 54    | 29.3    | 2.76     | 1.75–4.35 | <0.001  | 1.00    | 0.61–1.65 | 0.998   |
| Type of house wall                   |      |    |       |         |          |          |          |         |          |          |         |
| Brick wall (R)                       | 5943 | 59.4| 639   | 10.8    | 1        |          |          |         |          |          |         |
| Wood                                 | 3917 | 39.2| 672   | 17.2    | 1.72     | 1.53–1.93 | <0.001  | 1.03    | 0.88–1.19 | 0.752   |
| Others (e.g., zinc, bamboo)          | 140  | 1.4 | 27    | 19.3    | 1.98     | 1.29–3.04 | 0.002   | 1.05    | 0.65–1.68 | 0.853   |
| Type of house floor                  |      |    |       |         |          |          |          |         |          |          |         |
| Ceramic/granite/marble/tiles/terraso (R) | 3127 | 31.3| 222   | 7.1     | 1        |          |          |         |          |          |         |
| Cement                               | 6172 | 61.7| 957   | 15.5    | 2.40     | 2.06–2.80 | <0.001  | 1.70    | 1.43–2.03 | <0.01   |
| Wood                                 | 474  | 4.7 | 96    | 20.3    | 3.32     | 2.56–4.32 | <0.001  | 1.77    | 1.30–2.41 | <0.001  |
| Others (e.g., bamboo, soil)          | 227  | 2.3 | 63    | 27.8    | 5.03     | 3.65–6.93 | <0.001  | 2.08    | 1.43–3.04 | <0.001  |
| Main source of electricity           |      |    |       |         |          |          |          |         |          |          |         |
| Private (≤900 Watt)                  | 6909 | 69.1| 902   | 13.1    | 1.15     | 0.99–1.32 | 0.065   | 0.95    | 0.82–1.11 | 0.534   |
| Private (>900 Watt) (R)              | 2347 | 23.5| 272   | 11.6    | 1        |          |         | 1       |          |          |         |
| Shared electricity, no electricity   | 744  | 7.4 | 164   | 22.0    | 2.16     | 1.74–2.67 | <0.001  | 1.39    | 1.10–1.75 | 0.006   |
| Variable                                      | n   | %   | Poor index (<85%) | Univariate analysis | Multivariate analysis |
|----------------------------------------------|-----|-----|-------------------|---------------------|-----------------------|
|                                              |     |     |                   |                     |                       |
|                                              |     |     |                   | **Crude OR**        | **95%CI**             |
|                                              |     |     |                   | **p-value**         | **Adjusted OR**       |
|                                              |     |     |                   |                     | **95%CI**             |
|                                              |     |     |                   |                     | **p-value**           |
| Main source of drinking water                |     |     |                   |                     |                       |
| Bottled water/refill (R)                     | 4235| 42.4| 398               | 9.4                 | 1                     | 1                     |
| Tap/plumbing                                 | 1375| 13.8| 180               | 13.1                | 1.45                  | 1.20–1.75             | <0.001 | 1.26 | 1.02–1.54 | 0.030 |
| Bore wells                                    | 824 | 8.2 | 138               | 16.7                | 1.94                  | 1.57–2.39             | <0.001 | 1.48 | 1.18–1.85 | 0.001 |
| Protected wells                               | 2767| 27.7| 432               | 15.6                | 1.78                  | 1.54–2.06             | <0.001 | 1.25 | 1.06–1.47 | 0.007 |
| Unprotected wells                             | 264 | 2.6 | 76                | 28.8                | 3.90                  | 2.93–5.19             | <0.001 | 2.03 | 1.49–2.77 | <0.001 |
| Nature or others (e.g., river, lake, rain)   | 535 | 5.4 | 114               | 21.3                | 2.61                  | 2.07–3.29             | <0.001 | 1.71 | 1.32–2.22 | <0.001 |
| Toilet/latrine facilities                    |     |     |                   |                     |                       |
| Private with septic tank (R)                 | 8491| 84.9| 959               | 11.3                | 1                     | 1                     |
| Private without septic tank                  | 564 | 5.6 | 134               | 23.8                | 2.45                  | 1.99–3.01             | <0.001 | 1.61 | 1.29–2.01 | <0.001 |
| Shared/public toilet                         | 733 | 7.3 | 192               | 26.2                | 2.79                  | 2.33–3.33             | <0.001 | 1.74 | 1.42–2.12 | <0.001 |
| Others                                       | 212 | 2.1 | 53                | 25.0                | 2.62                  | 1.91–3.60             | <0.001 | 1.47 | 1.04–2.06 | 0.027 |
| R: reference group.                          |     |     |                   |                     |                       |
had no birth certificate had odds ratio 1.37 of having poor family development index compared to those who had birth certificate (aOR: 1.16–1.62).

Some indicators of household quality were also associated with family development index in multivariate analysis. Compared to the respondents who had the most proper floor of the house (ceramic/granite/marble/tiles/terraso), those who had only cement, wood and bamboo or soil had higher odds of having poor family development index with aOR: 1.70, 1.77, and 2.08, respectively. Respondents who had shared electricity or no electricity had 1.39 times of higher chance to have poor family development index compared to those who had private electricity with >900 Watt. Similarly, the improper sources of drinking water and improper toilet facility were both associated significantly with poor family development index. For example, the odds ratio of having poor family development index was higher among those who had no latrine facilities compared to respondents who had (aOR: 1.61; 95%CI: 1.29–2.01).

4. Discussion

Our study was able to determine the family development index in Aceh - a region with a long armed conflict experience and is implementing Islamic Shariah law. The results of this study could be used as strategic data for the stakeholders and policy makers in formulating policies and programs to increase the quality of the families not only in the region but also in other regions in Indonesia or other countries that have similar characteristics.

Our study found that 86.6% of the households could be classified had a good family development index based on 15 items that covered the peace, independence and happiness domain. One of the interesting findings is that the family development was not equal in each regency in Aceh; the percentage of families that had poor development index ranged between 2.5% in Sabang and 23.4% in Aceh Singkil. This suggests that there is a significant gap of family development between regencies in Aceh and this might also hold true for other provinces in Indonesia. Determining the regions with low family development index is important and these regions should be the focus of the family development programs of the government in the future.

Our data also found that respondents who had birth certificate had higher family development index compared to those who had no birth certificate. One of the reasons is that families that have a birth certificate have a proof of the fulfilment of right to have an identity as a child and as a family member. In addition, our study also found that the health insurance ownership was one of indicators that was associated with family development index. Personal good health is essential because it could help the family members to take care of each other. When one of family members gets sick, it potentially impacts the daily activities and therefore, the quality of the families.

Our study confirmed that economic indicator, represented by the quality of the house (the type of floor, the source of electricity, the source of drinking water and toilet facility), was associated with family development index. In Indonesian context, a proper house floor is made of ceramic, granite, marble, tiles, terraso and cement, while the proper sources of electricity are from national electricity or from a private diesel/generator. The ideal sources of drinking water are from bottled/refilled water, tap/plumbing, bore wells and protected wells. Our multivariate analysis found that households with improper house floor, electricity and drinking water sources, and toilet facility were likely to have poor family development index compared to those with proper ones. This finding suggests that to increase the family development index, it is also critical to improve the economic indicators of the households. This suggestion is also supported by the fact that the highest number of households that had poor family development index (29.3%) were the households that had the most improper house roofs which were made of wood, shingle, bamboo, thatch, coconut leaves or sugar palm leaves. In Indonesian context, these materials are used among the poorest families. In addition, family with low economic indicators not only associate with family development index but also with increased vulnerability to some diseases including soil-transmitted helminths.

Besides the aforementioned determinants, Aceh is widely known for its religiosity and in 2021, it had the highest percentage of Muslim population (98.56%) in Indonesia. According to a multinational survey, religiously unaffiliated individuals and inactive religious group members were likely to be less content and less civically involved than people who actively participate in religious congregations. This suggests that religiosity of a community affects how they have social interactions with others, which is also a part of happiness. Additionally, willingness to worship is also a reflection of peace dimension. These could be one of the reasons for the relatively high family development index among the households in this study.

There are some limitations of this study that need to be discussed. Although this study surveyed relatively high number households, all of them were from only one province with unique condition. Therefore, the results of the study might not be able to be generalized to other regions in Indonesia. In this study, there might be social-desirability bias where the
individuals tend to answer the questions in a manner that will be viewed favorably by the interviewers. However, the respondents have been requested to be honest during the interviews and no private information was collected.

5. Conclusion
We assessed three elements of the households (peace, independence and happiness) to determine the family development index in Aceh, an underdeveloped region in Indonesia with long armed conflict experience. Our data indicate that the family development index is relatively high. Residents from North Aceh, Southeast Aceh, Aceh Singkil and Aceh Jaya (compared to those in the capital of Aceh province); divorced respondents (compared to married ones); those who have educational qualifications lower than senior high school; those who have no health insurance and have no birth certificate; those who have improper house floor, source of drinking water and toilet facility; and individuals who have shared electricity or no electricity (compared to those who have private electricity) have a risk of having poor family development index. Therefore, to further improve the quality of families in other places in Indonesia, the government should target those groups in particular, those with low socio-economics status.

Data availability
Underlying data
Figshare: ‘Factors affecting the family development index in Indonesia: a survey in Aceh, a region with 30-years armed conflict and under Shariah law’. DOI: https://doi.org/10.6084/m9.figshare.21218447.

Data are available under the terms of the Creative Commons Attribution 4.0 International license (CC-BY 4.0).

This project contains the following underlying data:

- Master Data.xlsx [Table containing the raw data of the study].
- Code book.pdf

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