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## 32. Associated Factors of Stunting among School-Age Children in Bandar Lampung, Indonesia

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**【Background & aim】** Assessment of growth can represent health status of children and indirectly determine the quality of life. However, in Indonesia, literature in this issue for children over five years is limited. This study aimed to clarify growth status and analyzed the association between social factors with stunting status of school-age children in Bandar Lampung, Indonesia. **【Methods】** A cross-sectional study was conducted in two sub-districts in Bandar Lampung; the highest and the lowest prevalence area of stunting under five. From each sub-districts, elementary schools were chosen using purposive sampling until the number of school children reach the sample size; 125 students. Children's height was measured and socio-demographic factors was obtained from children's mother. Stunting was interpreted according to WHO 2007 references. **【Results】** Percentage of mild stunting and stunting were 33.5% and 17.1%, respectively. Father's occupation, father's education, mother's education, Posyandu attendance, mother perception on children height status when children under five and currently had significant associations with stunting. **【Conclusion】** Posyandu participation was not effective improving nutritional status of children. Improving education of parents through Posyandu services may increase children nutritional status if quality of Posyandu services and qualified resources can be promoted.

## 33. 母親の生活習慣や母体・出生要因が児の発育不全に及ぼす影響

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**【目的】** 生活習慣病は高齢化に伴い医療費が増大している等、近年着目されている事項である。胎児期から幼少期にかけての低栄養等による児の発育不全が将来の生活習慣病発症のリスクを高める DOHaD 仮説が提唱されており、胎内での適切な環境が将来の生活習慣病発症予防につながると考えられている。本研究では、母親の生活習慣や母体・出生要因と児の発育不全との関連性を明らかにすることを

目的とした。**【方法】** 群馬県が平成 25 年度に「母親への食に関するアンケート調査」を 1 歳半検診で行い回答のあった 4,478 例 (回答率 57.3%) の数値化されたデータより、出生週数、出生体重、喫煙歴 (ほぼ毎日吸う・時々吸う・やめた・吸わない)、飲酒歴 (ほぼ毎日・週に 3~4 日・週に 1~2 日・月に 1~3 日・禁酒・飲まない)、妊娠前母親体重及び妊娠分娩時の母親体重増加量、出生順位を調べた。その上で、児の発育不全の指標として出生週数から算出される予想体重と実際の出生体重を比較した標準偏差値 (Z 値: 子宮内発育不全を反映し以下 SFD と示す) を算出し、SFD と各出生分娩要因との関連性について統計学的検討を行った。統計解析には一元配置分散分布及び Pearson の相関分析を用いて解析した。**【結果】** ① SFD は喫煙歴・飲酒歴の検討で有意差は認められなかった。② 妊娠前の母親体重と SFD の検討では有意な正の相関であった。③ 妊娠分娩時の体重増加量と SFD の検討では有意な正の相関を示した。④ SFD は出生順位において有意差を認めた。第一子は第二子・第三子と比較し SFD が有意に低値であった。**【結論】** 妊娠前の母親低体重・妊娠分娩時の母親の体重増加量不良群・低出生順位 (初産) では児の発育不全の可能性が本結果から示唆された。今後、生活習慣病発症予防のためにこれらの結果を踏まえた妊娠期の栄養・体重管理が必要であると考えている。

## 34. Determining Distribution of Health Care Resources in Mongolia Using Lorenz Curve and Gini Coefficient

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**【Background】** Ensuring equality in access to health care is a key objective in any viable health policy. In Mongolia, a few studies focused on inequality in health care resources; however, they limited their investigation to either a specific population group and given geographical areas. Therefore, understanding the geographical distribution of health care resources, equal accessibility to such resources and improvement of them may lead to better planning to make health services accessible by all. Since we do not have specific study to measure distribution of health care resources, this study need to be conducted. The aim of this study is to determine the distribution of health care resources in Mongolia. **【Methods】** The Lorenz curve represents distribution of the health care resources. Distribution equality was determined using the Gini coefficient. The Gini coefficient measures the area between the Lorenz curve and a hypothetical line of absolute equality. The Gini coefficient

ranges between 0-1; 0 represents perfect equality, while coefficient of 1 implies perfect inequality. **【Results】** Ulaanbaatar (capital city of Mongolia) had highest number of health care resources among all provinces. Sub-urban areas (2 provinces) were slightly higher than other provinces and distribution of each health care resources per population were sufficient throughout the country. However, distribution of each health care resources per area were very low in rural areas (19 provinces). The calculated Gini coefficient physicians, nurses and beds by population 0.18, 0.07 and 0.06 respectively. But, calculated Gini coefficient physicians, nurses and beds by area 0.74, 0.67 and 0.69 respectively. **【Discussion】** Although the reasons for health services distribution are different factors such as social, economic and geographical. These factors more obvious in developed and developing countries as far as geographical distribution of health services in countries become a basic problem. In fact, there is not a great difference between statistics of ours with developed countries and we are near to the ideal point by numbers. Possible explanation for sufficient number of physician per population would be the law of regulations for newly graduated physicians who obligated to do work in the designated areas for 2 years. Furthermore, unequal distribution of health care resources by area associated with infrastructure, nomadic life style and remote areas, which cannot access public services and sparse located in large territory. **【Conclusion】** This kind of studies can be used as base for health system planning about correction of inequality of health care resources distribution.

### 35. Does Equal Distribution of Health Care Resources Matters? The Analysis of Distribution of Puskesmas with Health Indicators in Indonesia

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**【Background & Aim】** Puskesmas, the community health centers in Indonesia, aim to provide accessible and affordable health care services, emphasis on environmental and preventive health care. In order to make Puskesmas accessible, the government set the goal to provide at least one Puskesmas for every 3000 people, and available in every district. However, our previous study report that distribution of Puskesmas become more unequal, Gini index consistently increase from 0.19-0.28 between 2000-2014. The

fruitfulness of Puskesmas efforts should be reflected into health indicators. The aim of this study was to observe how the inequality of Puskesmas affecting health core indicators, such as life expectancy (LE), infant mortality rate (IMR), and maternal mortality rate (MMR). **【Methods】** Geo-demographic, health care resources, and health indicators data from 2000-2014 were collected. Gini indexes of physicians and Puskesmas were calculated. Correlations between variables were analyzed with Pearson correlation. **【Results】** LE improved from 67.97 to 70.59. IMR improved from 41 to 25.16. MMR improved from 264.89 to 133.00. Despite the trend of Gini index of Puskesmas by population were increased, Gini index of puskesmas by area decreased from 0.63 to 0.56. Pearson correlation analysis showed that the numbers of Puskesmas by population and by area were not involved to the improvement of LE, IMR, and MMR. **【Conclusions】** The results challenge the current idea that unequal distribution of health care resources will certainly aggravate health. The relationship between equality of health care resources, health, and the factor that influence it need to be fully understood.

### 36. 腱板大断裂ラットモデルにおける小円筋の代償性肥大 一ノ瀬 剛 (群馬大院・医・整形外科)

**【目的】** 棘上筋、棘下筋腱を含む大きな腱板断裂は長期の経過を辿っていることが多く、腱板の一次修復が困難な症例も少なくない。こうした症例に対して広背筋腱移行やリパース型人工肩関節の有効性が報告されており、小円筋の代償性肥大の存在はこれらの治療成績を向上させるとする報告が散見されるが、代償性筋肥大現象の詳細については未解明な点が多く残されている。本研究の目的は腱板大断裂ラットモデルを用い、残存した小円筋における代償性肥大の有無、および筋肥大関連遺伝子の発現を調査することである。 **【対象と方法】** 体重 240~260 g の雄性ラット 12 匹を対象とし、全身麻酔下に左肩の棘上筋・棘下筋腱、肩甲上神経の切離を行った。術後はケージ内で自由に行動させ、術後 4 週で屠殺し両側の棘上筋、棘下筋、小円筋を採取した。採取した筋肉の重量を測定し、小円筋について組織切片から筋繊維断面積 (CSA) を計測し、筋肥大関連シグナル分子である Akt, mTOR タンパクのリン酸化比率についてウエスタンブロッティングでの測定を行った。 **【結果】** 術側の棘上筋、棘下筋は健側に対し有意な重量の低下を示していた一方で、術側の小円筋重量および平均 CSA は健側に対し有意な増加を示していた。小円筋における Akt タンパクのリン酸化比率は術側と健側で有意差はなかったが、mTOR タンパクのリン酸化比率は術側の小円筋において有意に増加していた。 **【考察】** ラット後肢の下腿三頭筋腱切離により残存する足底筋の重量や筋肥大関連遺伝子の発現が有意に増加することが報告されている。