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A Cross-Sectional Assessment of Dietary Patterns and Their Relationship to Hypertension and Obesity in Indonesia

Anyanwu, Oyedolapo A[a] ; Folta, Sara C[a]; Zhang, Fang Fang[a]; Chui, Kenneth[b]; Chomitz, Virginia R[b]; Kartasurya, Martha I[c]; Naumova, Elena N[a]

Save all to author list

[a] Friedman School of Nutrition Science and Policy, Tufts University, Boston, MA, United States
[b] Public Health and Community Medicine, School of Medicine, Tufts University, Boston, MA, United States
[c] Department of Public Health Nutrition, Diponegoro University, Semarang, Indonesia

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Abstract
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Abstract

Background: There is a marked increase in the intake of foods associated with higher risks for hypertension and obesity in Indonesia . However, studies assessing the relationship between dietary patterns and health outcomes are few. Objective: The purpose of this study was to characterize dietary patterns and investigate their relationship with hypertension and obesity in Indonesia . Methods: Exploratory factor analysis was used to derive dietary patterns from a brief food scanner filled by 31,160 respondents aged 15 y and older in the Indonesian Family Life Survey wave 5 (IFLS 5). Age- and gender-specific quintiles of consumption were created for each pattern and the association between quintiles of each dietary pattern and the odds for hypertension and obesity were assessed using multivariate logistic regression analyses. Results: Two dietary patterns were identified: a modern dietary pattern characterized by fast foods, soft drinks, sweet snacks, and salty snacks and a traditional pattern characterized by fish, vegetables, and fruits. Younger age and being male were significantly correlated with higher consumption of the modern pattern ($P < 0.0001$ and $P = 0.03$, respectively). Analyses showed no association between hypertension and the modern pattern . However, the traditional pattern revealed lower odds for hypertension among those in the

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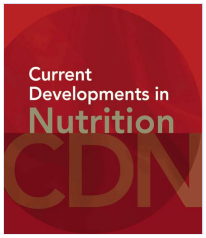

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Volume 6, Issue 6, June 2022

ORIGINAL RESEARCH

A Quasi-Experimental Evaluation of a Nutrition Behavior Change Intervention Delivered Through Women's Self-Help Groups in Rural India: Impacts on Maternal and Young Child Diets, Anthropometry, and Intermediate Outcomes

Samuel Scott, Shivani Gupta, Purnima Menon, Kalyani Raghunathan, Giang Thai ...

Current Developments in Nutrition, Volume 6, Issue 6, June 2022, nzac079, https://doi.org/10.1093/cdn/nzac079

Community-level impacts of a volunteer-led behavior change intervention delivered through women's self-help groups in 5 Indian states on nutrition outcomes in mothers and their young children were investigated.

Abstract ▼ View article Supplementary data

Mind the Gap: Exploring Nutritional Health Compared With Weight Management Interests of Individuals with Osteoarthritis

Ashley N Buck, Sarah P Shultz, Katie F Huffman, Heather K Vincent, John A Batsis ...

Current Developments in Nutrition, Volume 6, Issue 6, June 2022, nzac084, https://doi.org/10.1093/cdn/nzac084

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Xanthophylls in Human Milk and Maternal Diet: A Cross-sectional Analysis of Data from the Japanese Human Milk Study Cohort

Hiroshi M Ueno, Touko Sato, Satoshi Higurashi, Hiroyuki Tazaki, Yasuhiro Toba

Current Developments in Nutrition, Volume 6, Issue 6, June 2022, nzac093, https://doi.org/10.1093/cdn/nzac093

β-Cryptoxanthin in human milk, the xanthophyll most influenced by the maternal β-cryptoxanthin intake, is mainly attributed to Japanese citrus consumption.

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Dietary Fiber to Starch Ratio Affects Bovine Milk Oligosaccharide Profiles

Sierra D Durham, Danielle G Lemay, Zhe Wei, Kenneth F Kalscheur, John W Finley ...

Current Developments in Nutrition, Volume 6, Issue 6, June 2022, nzac033, https://doi.org/10.1093/cdn/nzac033

Consuming a low starch high fiber diet promoted greater overall bovine milk oligosaccharide production than a low

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A Low-Starch and High-Fiber Diet Intervention Impacts the Microbial Community of Raw Bovine Milk

Laurynne C Coates, David Storms, John W Finley, Naomi K Fukagawa, Danielle G Lemay ...

Current Developments in Nutrition, Volume 6, Issue 6, June 2022, nzac086, https://doi.org/10.1093/cdn/nzac086

Summary: Dairy cow consumption of low-starch and high-fiber feed was associated with enrichment of bacteria capable of degrading fiber, and depletion of mastitis- and spoilage-associated bacteria, in raw milk.

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Implementation of a Family Support Grant to Subsidize Caregiving Needs and Support Attendance at American Society for Nutrition's Annual Professional Scientific Conference

Michelle I Cardel, Matthew S Loop, Andrew W Brown, Michelle M Bohan Brown, Faith Newsome ...

Current Developments in Nutrition, Volume 6, Issue 6, June 2022, nzac076, https://doi.org/10.1093/cdn/nzac076

This paper describes the impact of a family support grant on attendance and the utilization of resources at a conference held by a professional society in nutrition.

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Acceptability and Experiences with the Use of 3D Scans to Measure Anthropometry of Young Children in Surveys and Surveillance Systems from the Perspective of Field Teams and Caregivers

Maria Elena D Jefferds, Zuguo Mei, Mireya Palmieri, Karla Mesarina, Dickens Onyango ...

Current Developments in Nutrition, Volume 6, Issue 6, June 2022, nzac085, https://doi.org/10.1093/cdn/nzac085

Portable 3D scan systems were generally acceptable to anthropometrists and caregivers of children aged <60 mo to measure child anthropometry in household survey and surveillance settings.

Abstract ▾ View article Supplementary data

The Effects of 1 Egg per Day on Iron and Anemia Status among Young Malawian Children: A Secondary Analysis of a Randomized Controlled Trial

E Rochelle Werner, Charles D Arnold, Bess L Caswell, Lora L Iannotti, Chessa K Lutter ...

Current Developments in Nutrition, Volume 6, Issue 6, June 2022, nzac094, https://doi.org/10.1093/cdn/nzac094

The egg intervention did not impact children's iron status or prevalence of anemia. Young children in rural Malawi remain at high risk of iron deficiency and anemia.

Abstract ▾ View article Supplementary data

The 2018 World Cancer Research Fund/American Institute for Cancer Research (WCRF/AICR) Score and All-Cause, Cancer, and Cardiovascular Disease Mortality Risk: A Longitudinal Analysis in the NIH-AARP Diet and Health Study

Marissa M Shams-White, Nigel T Brockton, Panagiota Mitrou, Lisa L Kahle, Jill Reedy

Current Developments in Nutrition, Volume 6, Issue 6, June 2022, nzac096, https://doi.org/10.1093/cdn/nzac096

This study examines the association between adherence to the 2018 World Cancer Research Fund/American Institute for Cancer Research (WCRF/AICR) Cancer Prevention Recommendations and mortality risk among older US adults.

Abstract ▾ View article Supplementary data

A Cross-Sectional Assessment of Dietary Patterns and Their Relationship to Hypertension and Obesity in Indonesia

Oyedolapo A Anyanwu, Sara C Folta, Fang Fang Zhang, Kenneth Chui, Virginia R Chomitz ...

Cross-sectional assessment of dietary patterns and cardiometabolic risk factors showed that a “traditional” dietary pattern was associated with lower odds for hypertension among adolescents and adults in Indonesia.

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Reduction in Ferritin Concentrations among Patients Consuming a Dark-Green Leafy Vegetable–Rich, Low Inflammatory Foods Everyday (LIFE) Diet

Brittany M Perzia, Gui-Shuang Ying, Joshua L Dunaief, David M Dunaief

Current Developments in Nutrition, Volume 6, Issue 6, June 2022, nzac095, https://doi.org/10.1093/cdn/nzac095

A dark-green leafy vegetable–rich, Low Inflammatory Foods Everyday (LIFE) diet reduces serum ferritin concentrations and may benefit patients with chronic diseases, iron overload, and iron-induced oxidative stress.

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PERSPECTIVES AND OPINIONS

Perspective: Achieving Sustainable Healthy Diets Through Formulation and Processing of Foods

Adam Drewnowski, Patrick Detzel, Petra Klassen-Wigger

Current Developments in Nutrition, Volume 6, Issue 6, June 2022, nzac089, https://doi.org/10.1093/cdn/nzac089

Food processing and food (re)formulation are distinct concepts. Formulation and reformulation of processed foods can improve nutrient density and healthfulness of the food supply at an affordable cost.

Abstract ▼ View article

REVIEW

Eating for 2: A Systematic Review of Dutch App Stores for Apps Promoting a Healthy Diet during Pregnancy

Janine P M Faessen, Desiree A Lucassen, Marion E C Buso, Guido Camps, Edith J M Feskens ...

Current Developments in Nutrition, Volume 6, Issue 6, June 2022, nzac087, https://doi.org/10.1093/cdn/nzac087

Evaluation of 57 diet-related pregnancy apps from Dutch app stores indicated that apps had moderate quality, contained basic dietary information with limited details, and implementation of behavior change techniques was limited.

Abstract ▼ View article Supplementary data

Complementary Feeding Practices among Young Children in China, India, and Indonesia: A Narrative Review

Outi Sirkka, Marieke Abrahamse-Berkeveld, Eline M van der Beek

Current Developments in Nutrition, Volume 6, Issue 6, June 2022, nzac092, https://doi.org/10.1093/cdn/nzac092

A large proportion of world's malnourished children live in Asia. This article summarizes the complementary feeding practices in China, India and Indonesia and discusses the relevance for health outcomes.

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Front Matter

All issues

PERSPECTIVES AND OPINIONS

CURRENT DEVELOPMENTS IN NUTRITION

Food and Nutrition Policy

Perspective: Achieving Sustainable Healthy Diets Through Formulation and Processing of Foods

Adam Drewnowski,[1] Patrick Detzel,[2] and Petra Klassen-Wigger[3]

[1]Center for Public Health Nutrition, University of Washington, Seattle, WA, USA; [2]Novartis, Basel, Switzerland; and [3]Nestlé Research and Development, Vers-chez-les-Blanc, Lausanne, Switzerland

ABSTRACT

Food processing and food (re)formulation can contribute to achieving sustainable healthy diets. Distinct from product formulation, the main purpose of food processing is to provide a stable and resilient supply of safe, shelf-stable, and affordable foods. Although efforts at reformulating processed foods have focused on removing excess added fat, sugar, and salt, product formulation can also take the form of voluntary fortification with protein, fiber, and micronutrients to improve dietary nutrient density and address population health needs. Advances in food technology have also led to the addition of desirable ingredients, including plant-based proteins and fermentation products, to processed foods. Among continuing challenges to product (re)formulation are the need to ensure product safety, maintain sensory appeal, control product cost, assure consumer acceptance, and manage the environmental footprint across the value chain. Voluntary (re)formulation of processed foods by the food industry can help improve diet quality and food security for all. *Curr Dev Nutr* 2022;6:nzac089.

Keywords: formulation, food processing, fat, sugar, salt, fortification, micronutrients, nutrient profiling, regulation

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The present analyses were supported by Nestlé.
Author disclosures: AD is a member of the Nestlé Scientific Advisory Board. AD has received grants, contracts, and honoraria from entities both public and private, with an interest in dietary nutrient density and nutrient profiling of foods. PK-W is with Nestlé Research and Development. PD was with Nestlé at the time of this work and is now with Novartis.

Address correspondence to AD (e-mail: adamdrew@uw.edu).

Abbreviations used: ATNI, Access to Nutrition Initiative; LMIC, low- and middle-income countries; NP, nutrient profiling; OECD, Organization for Economic Co-operation and Development.

Introduction

Guiding principles for achieving sustainable healthy diets were recently developed by the FAO and the WHO (1). Sustainable healthy diets need to be healthy and safe, economically affordable, socioculturally acceptable, and with low environmental impact (1, 2). The affordability of healthy diets in the context of food security was the topic of another FAO report (3). Based on FAO estimates (4), the cost of healthy diets was far in excess of the international poverty line (US$1.90/d). One question with implications for global public health nutrition is whether the sought-after affordable nutrient density for all (3) can be achieved without processed foods.

Although the promotion of fresh unprocessed foods remains the primary health goal (5), experts do acknowledge that a parallel reformulation of processed foods would improve population diets. The WHO has encouraged the private sector to produce more food products that eliminate *trans* fats, reduce saturated fat, and are lower in sugar and salt (6). Industry policies, research, and development need to encourage the production of lower cost and more nutrient-dense foods.

Food processing and food (re)formulation are distinct concepts. The role of food processing is to transform perishable agricultural products into foods and beverages that people consume (7). Food processing contributes to the stability of the food supply, helps minimize price spikes and price volatility, and allows food systems to withstand emergencies, disasters, and shocks (8). Though product reformulation has become identified with reducing fat, sugar, and salt, it can also include enrichment or food fortification with vitamins and minerals (9). Many low- and middle-income countries (LMIC) still face the problem of inadequate nutrients and the frequent lack of high-quality protein (10). Some challenges to product reformulation are discussed below.

Product Reformulation

Four approaches to product reformulation are identified in this report and summarized in **Table 1**. The first involves total removal of industrial *trans* fat and partial or total removal of added fat, added sugar, and sodium. The second involves mandatory or voluntary product fortification with protein, fiber, vitamins, and minerals. The third involves the addition to processed foods of minimally processed desirable components (whole grains, fruit, nuts, seeds). The fourth involves technological innovation and the use of new functional ingredients to create a new generation of processed plant-based foods.

ORIGINAL RESEARCH

CURRENT DEVELOPMENTS IN NUTRITION

Community and Global Nutrition

Acceptability and Experiences with the Use of 3D Scans to Measure Anthropometry of Young Children in Surveys and Surveillance Systems from the Perspective of Field Teams and Caregivers

Maria Elena D Jefferds,[1] Zuguo Mei,[1] Mireya Palmieri,[2] Karla Mesarina,[2] Dickens Onyango,[3] Rael Mwando,[3] Victor Akelo,[4] Jianmeng Liu,[5,6] Yubo Zhou,[5,6] Ying Meng,[5,6] and Karim Bougma[7]

[1]Nutrition Branch, Centers for Disease Control and Prevention, Atlanta, GA, USA; [2]Nutrition and Micronutrients Unit, Institute of Nutrition of Central America and Panama (INCAP), Guatemala City, Guatemala; [3]Kisumu County Department of Health, Kisumu, Kenya; [4]Office of the Director, Center for Global Health, Centers for Disease Control and Prevention, Kisumu, Kenya; [5]Institute of Reproductive and Child Health, Peking University, Beijing, China; [6]National Health Commission Key Laboratory of Reproductive Health, Peking University, Beijing, China; and [7]Centers for Disease Control and Prevention Foundation, Atlanta, GA, USA

ABSTRACT

Background: Portable systems using three-dimensional (3D) scan data to calculate young child anthropometry measurements in population-based surveys and surveillance systems lack acceptability data from field workers and caregivers.

Objective: The aim was to assess acceptability and experiences with 3D scans measuring child aged 0–59 mo anthropometry in population-based surveys and surveillance systems in Guatemala, Kenya, and China (0–23 mo only) among field teams and caregivers of young children as secondary objectives of an external effectiveness evaluation.

Methods: Manual data were collected twice and 12 images captured per child by anthropometrist/expert and assistant (AEA) field teams (individuals/country, $n = 15$/Guatemala, $n = 8$/Kenya, $n = 6$/China). Caregivers were interviewed after observing their child's manual and scan data collection. Mixed methods included an administered caregiver interview (Guatemala, $n = 465$; Kenya, $n = 496$; China, $n = 297$) and self-administered AEA questionnaire both with closed- and open-ended questions, and 6 field team focus group discussions (FGDs; Guatemala, $n = 2$; Kenya, $n = 3$; China, $n = 1$). Qualitative data were coded by 2 authors and quantitative data produced descriptive statistics. Mixed-method results were compared and triangulated.

Results: Most AEAs were female with secondary or higher education. Approximately 80–90% of caregivers were the child's mother. To collect all anthropometry data, 62.1% of the 29 AEAs preferred scan, while 31% preferred manual methods. In FGDs, a key barrier for manual and scan methods was lack of child cooperation. Across countries, approximately 30% to almost 50% of caregivers said their child was bothered by each manual and scan method, while ≥95% of caregivers were willing to have their child measured by scans in the future.

Conclusions: Use of 3D scans to calculate anthropometry measurements was generally at least as acceptable as manual anthropometry measurement among AEA field workers and caregivers of young children aged <60 mo, and in some cases preferred. *Curr Dev Nutr* 2022;6:nzac085.

Keywords: young children, anthropometry, 3D imaging system, acceptability, caregivers, anthropometrists, surveys, surveillance systems

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The Bill & Melinda Gates Foundation funded the Centers for Disease Control and Prevention Foundation, Atlanta, GA, to provide technical assistance to conduct the evaluation (grant OPP1179307).

Author disclosures: This paper describes effectiveness evaluation findings of the proprietary technology "AutoAnthro system" developed by the for-profit corporation Body Surface Translation (BST). In May 2018, the Centers for Disease Control and Prevention Foundation (CDCF) paid BST to travel to Atlanta to train CDC/CDCF staff on use of the AutoAnthro system over 2 days. CDC/CDCF then traveled to the department of Huehuetenango in Guatemala for approximately 2 weeks to carry out training and pilot testing for the collection of acceptability data and of manual and scan anthropometry data among 50 children <24 months and 50 children aged 24–59.9 months. The objectives of CDC/CDCF staff were to pre-test all training and field evaluation methods integrated into the existing surveillance system procedures, revise data-collection instruments and field procedures, and identify, trouble-shoot, and resolve any practical or technical issues with the use of the AutoAnthro system. As agreed in the Bill & Melinda Gates Foundation funding to CDCF, BST observed the training and pilot testing and helped trouble-shoot use of the AutoAnthro system with the 100 children. The data from the 100 Guatemalan children pilot are not part of the current paper, and BST was supported by a separate Bill & Melinda Gates Foundation grant to conduct this work. BST did not fund the effectiveness evaluation results reported in this paper, did not have any input into the design of the effectiveness evaluation, nor did BST have access to the data or analyses reported in this study prior to publication. The authors report no conflicts of interest. The Bill and Melinda Gates Foundation was not involved in the study and there were no restrictions regarding publication. The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention (CDC).

Supplemental Figures 1 and 2, Supplemental Text, and Supplemental Tables 1 and 2 are available from the "Supplementary data" link in the online posting of the article and from the same link in the online table of contents at https://academic.oup.com/cdn/.

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Address correspondence to MEDJ (e-mail: mnj5@cdc.gov).

Abbreviations used: AEA, anthropometrist/expert and assistant(s); BST, Body Surface Translations; CDCF, Centers for Disease Control and Prevention Foundation; FGD, focus group discussion; HC, head circumference; MCH, maternal and child health; MUAC, midupper arm circumference; 2D, two-dimensional; 3D, three-dimensional.

ORIGINAL RESEARCH

Maternal and Pediatric Nutrition

CURRENT DEVELOPMENTS IN NUTRITION

Xanthophylls in Human Milk and Maternal Diet: A Cross-sectional Analysis of Data from the Japanese Human Milk Study Cohort

Hiroshi M Ueno,[1] Touko Sato,[2] Satoshi Higurashi,[1] Hiroyuki Tazaki,[2] and Yasuhiro Toba[1]

[1]Research and Development Department, Bean Stalk Snow Co., Ltd, Kawagoe, Japan and [2]School of Veterinary Medicine, Nippon Veterinary and Life Science University, Musashino, Japan

ABSTRACT

Background: Maternal diet and sociodemographic factors influence xanthophyll concentration and composition in human milk. However, the importance of dietary patterns regarding the intake of fruits, vegetables, and xanthophylls remains unclear.

Objective: The aim was to determine the composition of xanthophylls in the human milk of Japanese mothers and explore associations of xanthophylls with dietary and sociodemographic factors.

Methods: This cross-sectional study was conducted in the early phase of the Japanese Human Milk Study. Xanthophyll content was measured using liquid chromatography at 30–36 d postpartum. Maternal intake of foods, nutrients, and dietary supplements was estimated using a food-frequency questionnaire. Linear regression models were established using xanthophylls, maternal diet, and sociodemographic factors.

Results: Xanthophyll concentrations were measured in human milk from 118 mothers. The xanthophyll concentration varied among individuals. The median (IQR) concentrations of lutein, zeaxanthin, and β-cryptoxanthin were 65.6 ng/mL (51.6–103.4 ng/mL), 18.6 ng/mL (12.9–25.8 ng/mL), and 15.6 ng/mL (9.0–26.0 ng/mL), respectively. In multivariate models, the lutein concentration was associated independently with dietary green vegetables, exclusive breastfeeding, and education ($r^2 = 0.153$ for the model; $\beta \pm$ SE: 0.468 ± 0.198, 25.048 ± 10.222, and 13.460 ± 6.774; standardized $\beta = 0.210$, 0.217, and 0.175; $P = 0.019$, 0.016, and 0.049 for dietary green vegetables, exclusive breastfeeding, and education, respectively). For zeaxanthin, exclusive breastfeeding was the most appropriate predictor ($r^2 = 0.085$; $\beta \pm$ SE: 7.811 ± 3.300; standardized $\beta = 0.218$; $P = 0.020$). The highest predictive power for human milk β-cryptoxanthin was obtained with dietary β-cryptoxanthin ($r^2 = 0.258$; $\beta \pm$ SE: 0.089 ± 0.015; standardized $\beta = 0.468$; $P < 0.001$), attributed to maternal citrus intake.

Conclusions: β-Cryptoxanthin in human milk was the xanthophyll most influenced by the maternal diet in Japanese women. The β-cryptoxanthin concentration in human milk was reflected by the maternal β-cryptoxanthin intake, mainly attributed to Japanese citrus consumption. This trial was registered in the Japanese Clinical Trials Registry (https://center6.umin.ac.jp/cgi-open-bin/ctr_e/ctr_view.cgi?recptno=R000017649) as UMIN000015494. *Curr Dev Nutr* 2022;6:nzac093.

Keywords: xanthophylls, beta-cryptoxanthin, human milk, Japan, maternal diet

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Supported by Bean Stalk Snow Co., Ltd.

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Supplemental Figure 1 and Supplemental Tables 1–5 are available from the "Supplementary data" link in the online posting of the article and from the same link in the online table of contents at https://academic.oup.com/cdn/.

Address correspondence to HMU (e-mail: hiroshi-ueno@meg-snow.com).

Introduction

Breastfeeding is beneficial to mothers and infants. It reduces the risk of diabetes, breast, and ovarian cancer for mothers and the risk of infectious illness for infants (1). At 3 mo postpartum, 55% of Japanese mothers successfully continue exclusive breastfeeding for their children, while 90% of mothers breastfeed in either exclusive breastfeeding or mixed feeding (2). Early initiation of breastfeeding, early skin-to-skin contact, and the rooming-in effect support the maintenance of exclusive breastfeeding (3). Approximately 50% of the energy intake of young infants is obtained from human milk fat, which contains fatty acids, lipophilic vitamins, and bioactive components including fat-soluble phytochemicals (4). We recently conducted an analysis of 1079 samples of human milk from Japanese women and showed that 46.7% of energy in human milk was supplied from fat (5).

Carotenoids, which are bioactive phytochemicals, are a well-known natural pigment, and there are approximately 600 unique carotenoids (6). Humans cannot synthesize carotenoids de novo; thus, the intake of carotenoids is dependent on the diet. Dietary carotenoids vary among individuals, and their bioavailability is influenced by the nature of each

ORIGINAL RESEARCH

CURRENT DEVELOPMENTS IN NUTRITION

Community and Global Nutrition

A Quasi-Experimental Evaluation of a Nutrition Behavior Change Intervention Delivered Through Women's Self-Help Groups in Rural India: Impacts on Maternal and Young Child Diets, Anthropometry, and Intermediate Outcomes

Samuel Scott,[1] Shivani Gupta,[1] Purnima Menon,[1] Kalyani Raghunathan,[1] Giang Thai,[2] Agnes Quisumbing,[2] Vandana Prasad,[3] Aditi Hegde,[3] Avijit Choudhury,[4] Madhu Khetan,[4] Carly Nichols,[5] and Neha Kumar[2]

[1]Poverty Health and Nutrition Division, International Food Policy Research Institute, New Delhi, India; [2]Poverty Health and Nutrition Division, International Food Policy Research Institute, Washington, DC, USA; [3]Public Health Resource Society (PHRS), New Delhi, India; [4]Professional Assistance for Development Action (PRADAN), New Delhi, India; and [5]Geographical and Sustainability Studies Department, University of Iowa, Iowa City, IA, USA

ABSTRACT

Background: Women's self-help groups (SHGs) have become one of the largest institutional platforms serving the poor. Nutrition behavior change communication (BCC) interventions delivered through SHGs can improve maternal and child nutrition outcomes.

Objectives: The objective was to understand the effects of a nutrition BCC intervention delivered through SHGs in rural India on intermediate outcomes and nutrition outcomes.

Methods: We compared 16 matched blocks where communities were supported to form SHGs and improve livelihoods; 8 blocks received a 3-y nutrition intensive (NI) intervention with nutrition BCC, and agriculture- and rights-based information, facilitated by a trained female volunteer; another 8 blocks received standard activities (STD) to support savings/livelihoods. Repeated cross-sectional surveys of mother-child pairs were conducted in 2017–2018 ($n = 1609$ pairs) and 2019–2020 ($n = 1841$ pairs). We matched treatment groups over time and applied difference-in-difference regression models to estimate impacts on intermediate outcomes (knowledge, income, agriculture/livelihoods, rights, empowerment) and nutrition outcomes (child feeding, woman's diet, woman and child anthropometry). Analyses were repeated on households with ≥1 SHG member.

Results: Forty percent of women were SHG members and 50% were from households with ≥1 SHG member. Only 10% of women in NI blocks had heard of intervention content at endline. Knowledge improved in both NI and STD groups. There was a positive NI impact on knowledge of timely introduction of animal-sourced foods to children ($P < 0.05$) but not on other intermediate outcomes. No impacts were observed for anthropometry or diet indicators except child animal-source food consumption ($P < 0.01$). In households with ≥1 SHG member, there was a positive NI impact on child unhealthy food consumption ($P < 0.05$).

Conclusions: Limited impacts could be due to limited exposure or skills of volunteers, and a concurrent national nutrition campaign. Our findings add to a growing literature on SHG-based BCC interventions and the conditions necessary for their success. *Curr Dev Nutr* 2022;6:nzac079.

Keywords: infant and young child feeding, anthropometry, India, women's self-help groups, behavior change communication

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Supplemental Tables 1–6 are available from the "Supplementary data" link in the online posting of the article and from the same link in the online table of contents at https://academic.oup.com/cdn/.

Address correspondence to SS (e-mail: samuel.scott@cgiar.org).

Abbreviations used: BCC, behavior change communication; DID, difference-in-difference; IYCF, infant and young child feeding; JEEViKA-MC, JEEViKA Multisectoral Convergence; MUAC, midupper arm circumference; NI, nutrition intensive; NNM, National Nutrition Mission; NRLM, National Rural Livelihood Mission; PHRS, Public Health Resource Society; PLA, participatory learning and action; PRADAN, Professional Assistance for Development Action; RCT, randomized controlled trial; SHG, self-help group; STD, standard arm; WINGS, Women Improving Nutrition through Group-based Strategies.

KOMISI ETIK PENELITIAN KESEHATAN
HEALTH RESEARCH ETHICS COMMITTEE
FAKULTAS KESEHATAN MASYARAKAT UNIVERSITAS DIPONEGORO
FACULTY OF PUBLIC HEALTH DIPONEGORO UNIVERSITY

KETERANGAN LOLOS KAJI ETIK
DESCRIPTION OF ETHICAL APPROVAL
"ETHICAL APPROVAL"

No : 01/EA/KEPK-FKM/2021

Protokol penelitian yang diusulkan oleh :
The research protocol proposed by

Peneliti utama : Elena N. Naumova
Principle Investigator

Nama Institusi : Tufts University
Name of the Institutional

Anggota Peneliti : 1. Oyedolapo A. Anyanwu
Member 2. Sara C. Folta
3. Virginia R. Chomitz
4. Fang Fang Zhang
5. Kenneth K Chui
6. Sri Achadi Nugraheni
7. Martha Irene Kartasurya

Dengan judul :
Tittle

"Faktor Risiko Kualitas Diet dan Penyakit Kardiovaskular di Indonesia dalam Konteks Transisi Gizi dan Pandemi COVID-19"

"Diet Quality and Cardiovascular Disease (CVD) Risk Factors in Indonesia in the Context of Nutrition Transitions and the COVID-19 Pandemic"

Dinyatakan layak etik sesuai 7 (tujuh) Standart WHO 2011, yaitu 1) Nilai Sosial, 2) Nilai Ilmiah, 3) Pemerataan Beban dan Manfaat, 4) Risiko, 5) Bujukan/Eksploitasi, 6) Kerahasiaan dan Privacy, dan 7) Persetujuan Setelah Penjelasan, yang merujuk pada Pedoman CIOMS 2016. Hal ini seperti yang ditunjukkan oleh terpenuhinya indikator setiap standar.

Declared to be ethically appropriate in accordance to 7 (seven) WHO 2011 Standards, 1) Social Values, 2) Scientific Values, 3) Equitable Assessment And Benefits, 4) Risks, 5) Persuasion/Exploitation, 6) Confidentiality and Privacy, and 7) Informed Concent, referring to the 2016 CIOMS Guidelines. This is as indicated by the fulfillment of the indicators of each standard.

Pernyataan Laik Etik ini berlaku selama kurun waktu tanggal 7 Januari 2021 sampai dengan tanggal 7 Januari 2022

This declaration of ethics applies during the period Jan, 7th 2021 until Jan, 7th 2022

Semarang, 7 Jan 2021
Professor and Chairperson,

dr. M. Sakundarno Adi, M. Sc, Ph.D.
NIP. 196401101990011001