

IMPLEMENTATION OF NUTRITION CURRICULUM TO UNDERGRADUATE STUDENTS IN FACULTY OF MEDICINE, MATARAM UNIVERSITY

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Abstract

Objective: To describe nutrition curriculum's implementation to undergraduate students Faculty of Medicine Mataram University (FMMU)

Methods Major part of nutritional sciences was placed in a Metabolism and Energy block and implemented to under graduate students. Nutrition curriculum was described in three processes, they are: development, implementation and internal evaluation. Every students participating in this block were included in the study. A semi-structure questionnaire was conducted to explore student's perception of nutrition curriculum's implementation.

Results Forty hours nutrition curriculum was developed and implemented to undergraduate students. Nutrition and diseases was the topic with longest duration (14.5), followed by patophysiology (7), nutrition and community (5.5), nutritional well-being and prevention (4), and each 3 hours by histology, biochemistry and physiology. Tutorial was the longest duration learning activities (28), followed by lectures (5), skills lab (3), and field visit and laboratory class each 2 hours. Among 61 participants, 52 (85.24%) students perceived that nutrition curriculum implementation helped them constructing their understanding of the subject from the basic to clinical nutrition. Sixty (98.36%) students were passed Metabolism and Energy block's assessment (cut off: 70). Among nutrition's topic given, nutrition and diseases were favorite subjects by 43 (70.49%), followed by nutrition and community by 8 (13.11%), nutritional well being and prevention by 7 (11.47%), and patophysiology 3 (4.91%) students. Among learning activities given, 41 (67.21%) student choose field visit as their favorite followed by skills lab by 8 (13.11%), tutorial by 6 (9.83%), laboratory and lecture each 3 (4.92%) students. Among assessment methods, Student Oral Case Analysis (SOCA) was chosen as a favorite method of assessment to 52 (85.24%) students.

Conclusion Nutrition and diseases was topic and tutorial was learning activity with longest duration. Most of students perceived that implementation of nutrition curriculum helped them constructing their understanding of the subject from the basic to clinical nutrition. Nutrition and diseases was the most interesting topic. Field visit was the most favorite learning activity and SOCA was choose as favorite method of assessment

Keywords: nutrition education, nutrition curriculum, problem-based learning, competence-based curriculum, medical education

Abstrak

Tujuan Mendeskripsikan pelaksanaan kurikulum nutrisi untuk mahasiswa S1 Fakultas Kedokteran Universitas Mataram (FK Unram)

Metode Pendidikan ilmu nutrisi untuk mahasiswa FK Unram sebagian besar dituangkan kedalam blok metabolisme dan energi. Penjabaran kurikulum nutrisi dilakukan mulai dari proses pengembangan kurikulum, pelaksanaan dan evaluasi internal. Setiap mahasiswa yang mengikuti blok Metabolisme dan Energi diikutkan dalam studi ini. Persepsi mahasiswa mengenai pelaksanaan kurikulum nutrisi digali melalui kuisioner.

Hasil Kurikulum nutrisi dilaksanakan dalam 40 jam pembelajaran. Durasi topik terlama adalah nutrisi klinis (14,5), diikuti patofisiologi (7), nutrisi masyarakat (5,5), nutrisi untuk kesehatan dan pencegahan (4), kemudian masing-masing 3 jam oleh histologi, biokimia dan fisiologi. Tutorial merupakan aktivitas pembelajaran terlama (28), diikuti oleh kuliah (5), skills lab (3), kunjungan lapangan dan laboratorium masing-masing 2 jam. Diantara 61 peserta, 52 (85,24%) mahasiswa merasa bahwa pelaksanaan kurikulum nutrisi telah membantu pemahaman materi dari nutrisi dasar kepada nutrisi klinis. Enam puluh (98,36%) mahasiswa lulus blok Metabolisme dan Energi (nilai ambang: 70). Nutrisi klinis terpilih sebagai topik yang paling disukai oleh 43 (70,49%) diikuti oleh nutrisi masyarakat 8 (13,11%), nutrisi untuk kesehatan dan pencegahan penyakit oleh 7 (11,47%) dan patofisiologi oleh 3 (4,91%) mahasiswa. Sebanyak 41 (67,21%) mahasiswa memilih kunjungan lapangan sebagai aktivitas pembelajaran favorit, diikuti dengan keterampilan medik 8 (13,11%), tutorial 6 (9,83%), kelas laboratorium dan kuliah masing-masing oleh 3 (4,92%) mahasiswa. Student Oral Case Analysis (SOCA) dipilih sebagai metode penilaian terfavorit oleh 52 (85,24%) mahasiswa.

Kesimpulan Nutrisi klinis merupakan topik dan tutorial merupakan aktivitas pembelajaran dengan durasi terlama. Sebagian besar mahasiswa merasa bahwa pelaksanaan kurikulum nutrisi telah membantu pemahaman materi dari nutrisi dasar kepada nutrisi klinis. Nutrisi klinis sebagai topik yang paling menarik, kunjungan lapangan merupakan aktivitas pembelajaran yang paling disukai dan SOCA terpilih sebagai metode penilaian yang terpopuler.

The traditional major emphasis of medical education programs has been the acquisition of basic scientific knowledge and practical skills in well-defined subject areas. Lecture that used to be the main learning activities, now simply act only as instructional class assignment or introduction to learning objectives. Changes in the practice environment, the recognition that alternative instructional models may be desirable in some cases, and the fact that instruction in the traditional subject areas does not prepare students for all aspects of medical practice in the near future have driven recent curricular changes at many schools.^{1,2}

Nutrition education to medical students is an important part of medical education. Nutrition education in competence-based curriculum confers challenge to many medical faculties to develop nutrition curriculum, which put the integration of different knowledge and skills from basic to clinical nutrition.

As medical education paradigm has shifted to problem-based learning paradigm, the National Academy of Science (NAS) recommendation of 25 hours nutrition education in 1985³, recently has beyond expectation as a specialized nutrition theme. At FMMU, the specialized nutrition theme called metabolism and energy block. It has adopted the Indonesian medical council-wide plan in 2006 that specifies desired learning objectives and provides an instrument for rating student achievement, but leaves the specifics of implementing this plan to be developed by faculty at individual instructional sites.^{1,4} Meaning that methods for achieving these learning objectives were intentionally left to be determined by

individual centers, departments, and block developer.

Metabolism and energy block at FMMU was a fifth block and implemented to first year undergraduate student. Metabolism and energy block was constructed in 5 weeks plus a week of assessment or equivalent to 40 hours nutrition education plus 3 hours assessment. Allocation of time has allowed every medical faculty to develop nutrition curriculum that fits to local consideration. The study was described implementation of nutrition curriculum to undergraduate student FMMU.

Methods

Participant

All student participate in metabolism and energy block was eligible to the study

Procedures

Development of nutrition curriculum

Nutrition curriculum was developed in the following steps: 1) determine specific ways area of competencies are addressed in a block theme; 2) develop learning objectives; 3) distribute learning objectives into learning activities; 4) construct methods of student's assessment.

Learning objectives were developed based on area of competence of the Medical Doctor Standard of Competence issued by the Medical Council of Indonesia (2006). Topic of nutrition curriculum was consisted of histology, biochemistry, physiology, patophysiology, nutritional well being and prevention, nutrition and community, and nutrition and diseases (table 1). Those subjects distributed in learning activities as follow: tutorial, lecture, field visit, skills lab

and laboratory class. Methods of student's assessment were student oral case analysis (SOCA), written test, student's assignment, laboratory class, tutorial, student's logbook

and diet history taking. A semi-structure questionnaire was conducted to explore student's perception of nutrition curriculum's implementation.

Table 1. Topic of nutrition

| Topic of nutrition |
|---------------------------------------|
| Histology of GI tract |
| Biochemistry |
| Physiology |
| Patophysiology |
| Nutritional well being and prevention |
| Nutrition and community |
| Nutrition and diseases |

Implementation of nutrition curriculum

Nutrition curriculum was implemented for 40 hours consist of 28 hours tutorial, 5 hours lecture, 3 hours skill lab, 2 hours field visit, 2 hours laboratory class. The faculty also provided additional time for students to learn by themselves. Methods of student's assessment consist of 20 minutes of student oral case analysis (SOCA), 2.5 hours written test. Introduction of SOCA at FMMU has

been previously described.²Other methods of assessment were obtained during process of learning, such as student assignment for field visit, laboratory class, tutorial, student's logbook and diet history taking for skill lab. Lecture was delivered by experts in clinical nutrition, dietetics, biochemistry, histology and community nutrition. Tutors had undergone training as tutor and SOCA examiner.

Tabel 2. Methods of assessment

| | |
|--------------------|----------------------------------|
| Final assessment | Written test |
| | Student oral case analysis |
| Process assessment | Student assignment (field visit) |
| | Laboratory class |
| | Tutorial |
| | Student's logbook |
| | Diet history taking (skill lab) |

Result

Participant's characteristic

A number of 61 students: 43 (70.49%) women and 18 (29.51%) men. All participants fulfilled 75% attendance of all learning activities in metabolism and energy blocks to undergo final assessment.

Implementation of nutrition curriculum

Nutrition curriculum in the metabolism and energy block was implemented to students who passed the previous block (infection and immunity).

Table 3. Topics distribution into learning activities and time duration(hours); Box with grey shading shows the topics given in the specific learning activities

| Topics | Learning activities | | | | | Time |
|---------------------------------------|---------------------|-----------|-------------|-----------|-----------------|-----------|
| | Lecture | Tutorial | Field visit | Skill lab | Laboratory clas | |
| Histology | 1 | 1 | - | - | 1 | 3 |
| Biochemistry | 1 | 1 | - | - | 1 | 3 |
| Physiology | - | 3 | - | - | - | 3 |
| Patophysiology | - | 7 | - | - | - | 7 |
| Nutritional well being and prevention | - | 4 | - | - | - | 4 |
| Nutrition and community | 1.5 | 4 | - | - | - | 5.5 |
| Nutrition and diseases. | 1.5 | 8 | 2 | 3 | - | 14.5 |
| Time | 5 | 28 | 2 | 3 | 2 | 40 |

A number of learning activities indicate a number of learning objectives that should be achieved by students in one topic. All 28 hours tutorial was fulfilled. Seven scenarios were discussed in tutorial class. Scenario's themes were consists of: nutritional well being and prevention, nutrition and community and nutrition and disease. Experts gave lectures 5 hours fully. Three hours skill lab was filled by diet history taking skill, 2 hours field visit to nutrition division of

general hospital of Mataram. Two hours laboratory class consists of histology of gastrointestinal tract and food biochemistry (Table 3).

Instrument of curriculum's implementation

Instruments were developed in order to monitor and evaluate implementation of curriculum. The following instruments were tabulated in table 4.

Table 4. Instruments used in metabolism and energy block

| Instruments | Corresponding instrument |
|--|--|
| Time schedule | Specific learning activities schedule; ie: field visit, expert consultations |
| Lecture checklist | - |
| Expert consultation list | List of expert and related field of expertise |
| Student logbook | Student logbook assessment manual |
| Laboratory manual | Laboratory assessment manual |
| Tutor's manual | Tutorial assessment manual |
| Tutorial student's manual | List of suggested references : textbook, intranet ebook |
| Skill lab student manual | - |
| Skill lab instructor manual | Skill lab assessment manual |
| Student's assignment assessment manual | - |
| SOCA examiner's manual | SOCA's component of assessment SOCA's manual of scoring SOCA's answering guidance manual |
| SOCA student's manual | "How to perform SOCA" manual |
| Block Manager Phone Number | - |
| Final assessment manual | Resume of scores of all learning activities |

The utilization of instruments is very important to block's team as both internal and external evaluation. Instrument must be checked routinely by block's team. Block's coordinator is responsible to whole process of implementation.

Perceptions of student

A number of 61 students were met the criteria to follow metabolism and energy block. Fifty two (85.24%) students perceived that nutrition curriculum implementation helped them constructing their understanding of the subject from the basic to clinical nutrition. Sixty (98.36%) students were passed Metabolism and Energy block's

assessment (cut off: 70). Among nutrition's subject given, nutrition and diseases were favorite subjects by 43 (70.49%), followed by nutrition and community 8 (13.11%) students, nutritional well being and prevention 7 (11.47%) students, and patophysiology 3 (4.91%). Among learning activities given, 41 (67.21%) student choose field visit as their favorite followed by skills lab 8 (13.11%) students, tutorial 6 (9.83%), laboratory and lecture each 3 (4.92%) students. Among assessment methods, SOCA was chosen as a favorite method of assessment to 52 (85.24%) students, followed by student's logbook by 5 (8.19%) students.

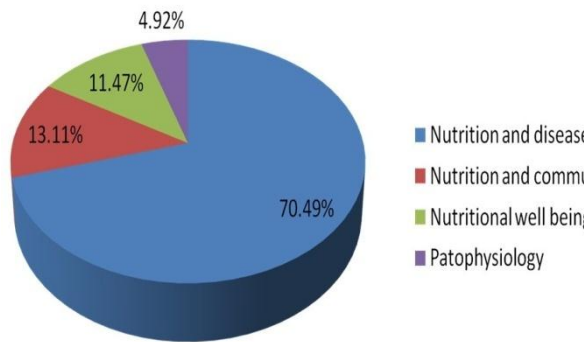


Figure 1. Nutrition's topics favored by students

Discussion

Development and Implementation of nutrition curriculum

Nutrition curriculum was successfully implemented to undergraduate student FMMU. The curricula change was acceptable to the faculty and the students; although the obstacles of this change were obvious, more administrative works and more human resources deployed in. Limitations were found during the process of curriculum development: the experts were not able to get involved in most of critical processes and when the panel meeting was held to introduce the curriculum, the block team was not able to explore their expertise; due to absent or reluctant to share their opinion. Local content of nutritional problem in West Nusa Tenggara province should be determined in this way. Also during the implementation, the effort to explore any feedback from experts found feedbacks not correspond to the curricula.

Methods of Assessment

Pearson et al (2001) explain barriers in nutrition education at medical school: absence of routine nutritional assessment in the current clinical setting and lack of

innovative teaching tools for effectiveness and feasibility.

In the study, nutritional assessments were divided into: process assessment and final assessment (table 3). There are five criteria for determining the usefulness of a particular method of assessment⁶: 1) reliability, 2) validity, 3) impact on future learning and practice, 4) acceptability to learners and faculty, and 5) costs. The needs of those criteria seems not be identified previously at the beginning of curriculum development, but at the end of implementation, a particular methods of assessment needed to be evaluated based on those criteria.² Metabolism and energy block's team encounter great challenges in assessment part, especially in developing instruments, determine what was "a good process" meant (portfolio: student logbook) and was it possible to establish "consensus" cut off point passing grade which student should achieved. Those challenges seems need to be discussed between medical faculties.

Innovative teaching tools include nutrition materials and instruments described above are lack of effectiveness and feasibility verification. Of these, author suggested those

barriers must be solved by national-wide nutrition education policy.

Internal evaluation of curriculum

Curriculum development is a critical part in education processes. In curriculum-based competencies the expected outcome of education processes is learner would have several designated competencies. Documenting the relationships between curriculum development and learner's competencies, or furthermore patient outcome represents one of the biggest challenges and greatest opportunities in curriculum development. Seven areas of

competencies (table 5) represent the effort to approach the competencies at FMMU. Competencies itself is described as integration of knowledge, skills, attitude and behavior in specific context. Furthermore, Epstein (2007) describe competencies as 1) a habit of lifelong learning, 2) contextual; where s/he able to perform task in particular situation, 3) developmental, meaning habits of mind and behavior and practical wisdom are gained through deliberate practice and reflection on experience.^{7,8,9} Therefore curriculum evaluation takes further research with excellent infrastructure support.

Tabel 5. Specific ways area of competencies are addressed in metabolism and energy block

| | |
|---|---|
| Effective communication: | <p>Discussion on tutorial session</p> <p>Diet history taking on skill lab session</p> <p>Developing dietary plan in various conditions on SOCA session</p> <p>Use of clinical studies</p> |
| Basic clinical skills: | <p>Discussion of how to measure nutritional status</p> <p>Discussion of how blood biochemistry is modified by nutritional status</p> |
| Medical science as a scientific guidance: | <p>Use of field visit study to nutrition division of General Hospital</p> <p>Discussion of how information of subjective and objective data be used</p> |
| Health problem management and solving: | <p>Student assignment of popular diet i.e. food combining, blood group diet.</p> <p>Panel discussion with expert i.e. malnutrition, diabetic, renal failure, hepatic failure</p> |
| Information management: | <p>Discussion of how to use suggested learning resources and search additional learning resources in the web</p> |
| Self-awareness and personal growth: | <p>Discussion of how nutrition status affected physical fitness in self</p> <p>Discussion of pattern of daily diet in self</p> |

Tabel 5. Specific ways area of competencies are addressed in metabolism and energy block(continuation from page 40)

| | |
|--|---|
| Ethical judgment, moral reasoning, medico-legal, professionalism and patient safety: | Ethical issues on nutritional status of admitted patients in hospital Discussion of how nutrition can modified drug absorption, action and efficacy Being professional in diet history taking Recognition of the importance of informed choice |
|--|---|

Conclusion

Nutrition and diseases was topic and tutorial was learning activity with longest duration. Most of students perceived that implementation of nutrition curriculum helped them constructing their understanding of the subject from the basic to clinical nutrition. Nutrition and diseases was the most interesting subject. Field visit was the most favorite learning activity and SOCA was choose as favorite method of assessment

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