

## **Case-based learning in a New Elective Course: Nutritional Therapy in Chronic Disease**

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### **Introduction**

A case is a narrative and may include data, important information, text and questions to students, and provide the basis for the analysis of complex, real world, authentic problems (Rienecker et al., 2015). The case method involves learning by doing. Case-based learning may provide students with a relevant opportunity to see theory in practice and to gain both theoretical and practical understanding of .e.g patients and prepares students for multifaceted problems that they are likely to encounter in professional practice case (Harman et al., 2015). Through case-based learning, students may acquire knowledge, skills and competences at the level of recognition and understanding as well as develop higher levels of abstraction, addressing open ended and complex problems (Rienecker et al., 2015). Students may also develop analytic, communicative and collaborative skills along with knowledge when working case-based. In their determined attempt to find solutions and reach decisions, through discussion, students apply analytical tools, reflect on their relevant experiences and draw conclusions they can relate to new situations (Centre for teaching and learning, 2019).

In this assignment a new elective course in the Master of Science study programme in Clinical Nutrition: Nutritional Therapy in Chronic Disease is evaluated with special emphasis on case-based learning.

## **Master of Science in Clinical Nutrition Educational Study programme**

The Master of Science (MSc) study programme in Clinical Nutrition prepares students for careers in a variety of occupational functions and areas e.g. treatment and counselling of patients in the primary and secondary sector, administration and management as well as research and teaching in the private industry, government agencies, and research or academic settings. The Clinical Nutrition study programme combines theoretical knowledge and evidence-based research with practical clinical applications. Students will enhance their ability to critically think in order to take on all challenges in the field of clinical nutrition. Additionally, students learn to design, implement and present research thereby enhancing their ability to collect, assess and critically analyse data.

Annually, a maximum of 30 students can be accepted on the Clinical Nutritional educational study programme. Requirements for the graduate study programme are Bachelor of Science (BSc) in Clinical Dietetics, Food Science, Natural Sciences, Medical Sciences or equivalent. If the number of qualified students is exceeded, applicants with a BSc in Clinical Dietetics have first priority before BSc's in Food Science specialised in nutrition and health followed by BSc's in Natural Sciences. The applicants with a BSc in Clinical Dietetics or Natural Sciences must have the following courses in their BSc educational study programme; 7.5 ECTS in biochemistry (including exercises), physiology, statistics and pathology and/or pharmacology. Applicants from Food Sciences must have the 7.5 ECTS course in pathology and pharmacology.

In 2019 there are 48 applicants. 35 qualified applicants were accepted into the MSc study programme primarily from the BSc study programmes in Clinical Nutrition or food science. Several students choose to study the two-year study programme after their bachelor study programme. Students with a background in clinical dietetics may have several years of clinical experience as registered clinical dietitians when they enter the master's study programme.

The MSc study programme in Clinical Nutrition covers 120 ECTS points in accordance with Ministerial Order on Bachelor and Master's Study programmes at Universities. The MSc study programme includes 60 ECTS in compulsory courses, 15 ECTS in elective courses and finally a 45 ECTS master thesis.

**Table 21.1.** MSc Clinical Nutrition Educational Study programme.

	Block 1	Block 2	Block 3	Block 4
Year 1	Nutrition Physiology	Evidence, Diet and Health	Pato- and Nutritional Physiology	Quality- Assurance and Management
	Nutrition Related Diseases	Basic Nutrition Patho-physiology		Clinical Paediatric Nutrition
Year 2	Elective courses	Master thesis		
	Elective courses			

## Course: Nutritional Therapy in Chronic Disease

The new elective course Nutritional Therapy in Chronic Disease (7.5 ECTS) is located in block 1, and was held between 3rd of September and 31th of October 2019.

### The course perspectives

The course Nutritional Therapy in Chronic Disease comprises how chronic disease affects human physiology with respect to metabolism, circulation and fluid balance. Moreover, students will learn the impact of individual nutritional therapy in chronic diseases including nutritional risk screening, planning and monitoring of a nutrition plan. For this course my role is to make the course plan, formulate the curriculum and determine and develop the contents of the lectures, including the cases. Moreover, I prepare the exams questions and evaluate student performance in oral or written exams. I also perform most of the lectures on this course. Current course specific intended learning outcomes (ILOs):

Knowledge:

- Describe the pathological processes of chronic disease and metabolism of nutrients.
- Describe the individual organs turnover of nutrients under stress-metabolic conditions.
- Describe the pathological processes in chronic disease, including infection, inflammation, diabetes and cardiovascular disease.
- Refer to principles of medical treatment.

**Skills:**

- Communicate the basic features in the pathological processes in chronic disease.
- Describe and discuss disease related nutritional problems with peers and other health professionals.

**Competences:**

- Interdisciplinary discussions of the individual patient's situation.
- Independently, be able to initiate, plan and monitor nutritional therapy.

**The student's perspectives**

Nutritional Therapy in Chronic Disease course comprises a mix of standard lectures and case-based learning. The students in the Clinical Nutrition study programme are few, approximately 25, and only 7 students chose this elective course, thus it is possible to have a safe, supportive and interacting learning environment. Skills and competences will be trained through student's own active interaction with case-based learning and in dialogue. When working case-based, the students will get some fixed working questions. The students then work together in pairs for approximately one hour. Subsequently, the students will reach a solution or clarify a problem by interacting with peers and finally wrap-up with the lecturer. At the end of the course, the students are assessed by a 4 hour written examination, including a case with fixed questions. The case and questions are aligned with the course specific ILOs. For example, the students should independently, show they are able to initiate, plan and monitor nutritional therapy in various chronic diseases, thus, this is an integral part of the examination.

**The colleague perspectives**

Colleagues were invited to give lectures within their research field e.g. lung diseases, gastrointestinal diseases, renal diseases etc. To create cohesion within the course, the course description has been sent out, and course specific ILOs for their lectures. In case-based learning the lecturer's role is a facilitator. Cases are designed following the principles of Dolmans and colleagues (Dolmans et al., 1997). The course is evaluated by the students and their feedback will be considered when preparing the course again next year.

Goals of the course are defined in terms of competences (Rienecker et al., 2015). The competences listed above are applicable and was assessed by cases during the course and in a written exam. To be valid, competences must be tested in authentic situations similar in complexity to what the students are expected to handle in the future (Dolin et al., 2017). To support this, the students had the opportunity to visit Frederiksberg Dialysis Centre. During the visit, the students had the opportunity to talk to a patient with renal insufficiency, and collect data, which allowed them to develop and solve a patient case.

## **Evaluation of the Nutritional Therapy in Chronic Disease course**

The evaluation is based on the feedback from student's, colleagues and the course responsible.

### **The course perspectives**

The lecture in cardiovascular diseases was unnecessary since the student's had received a similar lecture in Block 2 in the course "Basic Nutrition Patho-physiology" and again in Block 3 in the course "Pato- and Nutritional Physiology". The lecture regarding insulin treatment in diabetes focused on inpatients and not in chronic outpatients.

### **The colleague perspectives**

There was too much overlap in the lecture in cardiovascular diseases.

### **The student's perspectives**

In general the student's feedback was positive. The student's also found that there was too much overlap in the lecture in cardiovascular diseases. The student's liked the structure in the course; first having a standard lecture in the pathophysiological processes, then a standard lecture in the nutritional principles followed by a case in e.g. renal diseases. The student's also liked the excursion to Frederiksberg Dialysis Center, including developing their own patient case. The student's would like a more practical approach

e.g. to include dietary records in the cases to practice this important part of nutritional counseling.

To evaluate the case-based learning in the course five students answered 3 questions regarding case-based learning at the course evaluation:

- a) *What have you gained from case-based learning? What did you like in particular?*

Case-based learning has provided students an opportunity to work with real world, authentic problems through discussions. The Students appreciated developing communicative and collaborative skills along with knowledge when working case-based. In their determined attempt to find solutions and reach decisions, the students would have liked more time to discuss other possible solutions, and consequences of action.

- b) *How could the case-based learning in this course be improved?*

One student would like more time on patient monitoring, as well as a more practical approach including obtaining and calculating dietary records in the cases to practice this part in nutritional counseling. Another student suggests preparing the case from home. The student suggests this would save time and makes time to go through two cases instead of one. A limitation of the latter would be the lack of discussion in pairs. Finally, it is proposed that some cases are discussed with guest lectures, mostly medical doctors.

- c) *Did case-based learning support the course specific ILOs?*

All students agree; case-based learning is the most important in this course, because the course specific ILOs are discussed indirectly when working case-based. One student found working case-based important in order to pass the exam and as a preparation to work with real world problems. Another student found working case-based provided the best learning and understanding in relation to the standard lectures.

## **Pedagogical conclusions and perspectives of the Nutritional Therapy in Chronic Disease course**

Based on the evaluation from the students and experiences by the teachers and course responsible, the following modifications are suggested:

- a) Replace the lecture in cardiovascular diseases, with a lecture in cystic fibroses. Cystic fibrosis is a chronic disease, and nutritional therapy in this group of patients is very relevant and complex because the disease affects mostly the lungs, but also the pancreas, liver, kidneys, and intestine.
- b) The lecture in insulin treatment in diabetes should mainly be about diabetic outpatients. To avoid misunderstandings, overlap or uncertainties in relation to the course it will be purposed that lecturers have a meeting before the course introduction.
- c) Have one or two excursions to hospitals and arrange meetings with one or two patients. The students should be able to collect data/information for a case to ensure a more real world, authentic situation. This would test competences in authentic situations similar in complexity to what the students are expected to handle in their future professions.
- d) The course should have a more practical approach, including obtaining and calculating dietary records in the cases to practice this important part of nutritional counseling. This is especially important for students from the bachelor study programme in food science. Students with a background in clinical dietetics may have several years of clinical experience as registered clinical dietitians, when they enter the master's study programme.
- e) To involve the guest lecturers in the preparation of the cases and invite them to discuss some of the cases or parts of the cases with the students. This will strenghten both the complexity in the cases and promotes interdisciplinary discussions of the individual patient's situation.

## References

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