

The profession of pharmacists and 3D-printing of medicine in pharmacies

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Background Historically, the pharmacy profession has been closely linked with manufacturing of medicine at the pharmacy. Today, however, most manufacturing takes place within the pharmaceutical industry. A new manufacturing technique, 3D-printing, can return the pharmacy profession as manufacturers of medicine in the pharmacy.

Purpose The aim of this study was to explore how future pharmacists view the possibility of 3D printing of drugs in community and hospital pharmacies. As 3D printing is closely linked to personalized medicine, their views on personalized medicine were also explored.

Method An online questionnaire survey was carried out. The respondents were pharmacy students taking their pharmacy internship at the University of Copenhagen, Denmark. The questionnaire included questions on 1) personalized medicines, including pharmacists' potential role, 2) the possibility of 3D printing in pharmacies, including pharmacists' role, 3) who should take part in designing the medicine (patient, pharmacist, prescriber). The participants were recruited through a university course site, specific for the pharmacy internship. The questionnaire was developed in English by a Danish and a Dutch pharmacy student and translated into Danish.

Findings The questionnaire had 51 respondents with a response rate of 38.5 %. The main results were that for the majority of respondents (n=43) thought that 3D printing of medicine can have a role in the development of personalized medicine. Also, 31 students thought implementation of 3D printing of drugs would directly affect the pharmacist services where the majority of students (n=35) saw 'the pharmacists' ability to offer the best personalised treatment to the patient' as the biggest advantage, thereby advocating a patient rather than a professional perspective. Out of the respondents, 34 thought that the responsibility of designing the 3D tablets should be a 'joint collaboration with physician, pharmacist and patient'.

Conclusion A majority of the responding Danish pharmacy students believed that the pharmacist profession will evolve with the introduction of personalized medicine and 3D printed medicine. As students are the persons who are going to work as pharmacists in the future, this should be taken into consideration when looking ahead.