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**Explanation of pharmaceutical care of cardiovascular patients hospitalized in hospitals affiliated with Shahid Beheshti University of Medical Sciences**

Faezeh Sahbaeiroy  
Islamic Azad University, Iran

The main goal of pharmaceutical care is to provide effective services in the field of drug-related issues that ultimately leads to improvement of patients' status and increase in their quality of life. This qualitative study using three-step approach of the Strauss and Corbin (1998) was conducted with 20 participating patients of doctors, pharmacists and nurses semi-structured interviews. Total of 4508 basic codes were obtained at open coding step, the codes were overloaded based on their similarities and common points. Finally, 795 overloaded basic codes were created. In the next step, they were in the 152 classes and by frequent analysis, basic classes were reviewed and subsequently compared. Classes were merged together to create final 48 classes. The data were re-examined in the axial-coded of similar integrated classes that have certain common features been formed of the 19 subclasses and then the classes that were around an axis created the axial-classes. According to this process of five-axial classes which focus on causal-background conditions where the phenomenon happened, the strategies that were used to control the phenomenon, barriers and facilitators were obtained. The five main Classes were as inadequate responsibility of pharmaceutical care, prioritizing treatment over prevention, non-patient-centered vision and pharmaceutical Care with inadequate effectiveness and inefficient management. Description of story line and the final explanation method were used at selective coding step. Based on the findings of this study the main concerns of the participants were inadequate collective responsibility and inefficient management ultimately.

fsahbaei@sbumu.ac.ir

**Magnetic Fe<sub>3</sub>O<sub>4</sub>-based nanoparticles as drug delivery systems for targeted cancer therapy**

Juan Wu, Wei Jiang, Fengsheng Li, Yewen Shen, Wei Jiang and Renbing Tian  
Nanjing University of Science and Technology, China

The development of tumor specific multifunctional nanoparticles for targeted and efficient delivery of drugs to tumor cells is currently an area of intense research with the potential to revolutionize the treatment of cancer. As a major class of nanoparticles, magnetic iron oxide nanoparticles have been examined extensively for applications in cancer therapy due to their ultra-fine size, biocompatibility and magnetic properties. In addition, the pH value of most solid tumors (pH<6.0) was lower than the surrounding normal tissues (pH 7.4). Therefore, in our work, we developed and prepared two different Fe<sub>3</sub>O<sub>4</sub>-based doxorubicin (DOX) delivery systems and the drug loading modes were chemical bond (system I) and electrostatic adsorption (system II), respectively. In system I, Fe<sub>3</sub>O<sub>4</sub> nanoparticles were coated by polyethyleneglycol (PEG) used as surface-modifying agent and polyethyleneimine (PEI) used as the drug-loading site via a one-pot pyrolysis method. The prepared carriers were within 20 nm and had good stability in dispersion and super-paramagnetic properties. DOX was grafted to PEG/PEI@Fe<sub>3</sub>O<sub>4</sub> at a loading rate of up to 85% via the reaction between the 13-carbonyl of DOX and the primary amine of PEI. During *in vitro* release studies, nearly 81% DOX was released from the system within 72 h at pH 4.5, compared with only 28% at pH 7.4. For system II, DOX was loaded onto recyclable clusters of Fe<sub>3</sub>O<sub>4</sub> nanoparticles at a loading rate of 76.19% by electrostatic interaction which has desirable pH-responsivity usually exhibits easier operation in experimental procedure, and lower consumption and pollution. Moreover, the release studies *in vitro* showed that the system II had excellent pH-sensitivity, 76.16% of DOX was released within 72 h at pH 4.0, and the secondary drug loading rate was nearly 52%. WST-1 assays in model breast cancer cells (MCF-7) demonstrated that system II exhibited high anti-tumor activity, while the recyclable clusters of Fe<sub>3</sub>O<sub>4</sub> nanoparticles were practically non-toxic. Our results revealed that both system I and system-II would be a competitive candidate for targeted cancer therapy in the near future. While in the case of the little difference of drug loading rate and the release rate between system I and system II, the latter would be even better due to its environmentally friendly drug loading mode and the recyclable drug loading performance.

ifs\_njust@126.com