Reference ID	Main Author	Year	Study location	Aim	Study design	Methods	Site information	Study population	Recruitment method
21	Chen C (Department of Pharmacy, Kandang Kerbau Women's and Children's Hospital)	2013	Singapore	To evaluate the utility of tailored educational pharmacist counselling in improving knowledge and self-reported confidence in patient care by caregivers of children with epilepsy	Pharmacists worked with neurologists to individualise counselling for patients, using the handbook and hardcopy presentation slides during counselling. Pharmacists arranged follow-up sessions over the telephone 2 weeks after the counselling session, discussing the frequency and changes in characteristics of seizures and enquiring on the compliance with therapy and presence of side effects. Caregivers were provided with a self-administered questionnaire pre- and post-counselling session, with another questionnaire administered over the telephone.	Quantitative	An 830 bed hospital that provides specialised paediatric and women's healthcare services.	Caregivers who accompanied epileptic patients on neurology follow-up visits. (n=27)	Not specified.
22	Flannery DD (Alfred I du Pont Hospital for Children)	2014	USA	To assess prescribers attitudes about the Antibiotic Stewardship Programme, aimed to identify perceived strengths and weaknesses of the service, with the ultimate goal of maximising its effect on future prescribing.	A 10-question survey questionnaire was designed by a paediatric resident, 2 ID attending physicians and the ID pharmacist using Survey Monkey.	Quantitative	A 180-bed tertiary care academic paediatric hospital	93/153 (61%) of respondents participated: 67% (48/72) of resident physicians, 91% (10/11) of hospitalists, 41% (9/22) of PEM attending. 38% (8/21) of paediatric fellows and 67% (18/27) of APN/PAs.	Not specified.
23	Gray NJ (Green Line Consulting Limited)	2017	UK	There were 3 phases of the study. The objective of the stakeholder interviews (phase 2) was to share ideas of practicing pharmacists about their current and future roles in the support of young people (10-24yrs) who take medication for chronic illness with stakeholders to devise a list of roles for prioritization.	The first 2 phases – pharmacists FGs and stakeholder telephone interviews, reflecting the dearth of literature in this area and the need to capture and record ideas about current and future roles. The final phase –multidisciplinary discussion groups was quantitative, encouraging pharmacists and rheumatology professionals to discriminate between ideas and to priortise roles to be developed or enhanced.	Mixed-methods (triangulation)	Nationwide	2 pharmacy policy makers, 3 service commissioners, 2 pharmacy staff, 5 rheumatology professionals and 3 lay advocates	Stakeholders for interviews were generated by advisory group members and the project team.

Ref	*Inclusion/ exclusion criteria*	*Data collection*	*Analysis*	*Study findings*
21	Patients were aged below 18 years and must have been seeing a neurologist at the institution. They could have been either newly diagnosed or have existing epilepsy. These patients were either commencing treatment with a new AED, changing an AED or were non-compliant to AEDs. They were excluded if they were not contactable by telephone on 3 separate occasions for 2 weeks post counselling.	3 sets of questionnaires (Set A-C) were used with set A & C being knowledge-based. Both questionnaires were the same administered randomly pre and post counselling. Set B was the perception questionnaire. It was adapted from the validated instrument developed by Larson et al. For set A&C, scoring followed by negative grading system. Set B, "excellent" ratings were assigned 5 points, followed by "very good", "good", "satisfactory" and "poor".	The confidence scores before and after counselling and after telephone follow-up were compared using Wilcoxon signed ranks test. Statistical significance was defined as $p<0.05$.	The mean caregiver knowledge score for set C was significantly higher than that of set A (14.7±4.6 v 10.4±3.4, $p<0.05$). The confidence of caregivers in administering the AEDs improved after counselling (from 3.60 to 3.94). In regards to the patient satisfaction survey, scores between four and five suggested that the caregivers felt that that particular aspect of service was either very good or excellent. The caregivers were most satisfied with knowledge that the pharmacist displayed during the counseling and the courtesy shown to the caregivers (average score = 4.70 out of 5). This may reflect that the training of the pharmacists is adequate. Study results also suggested that the caregivers may not be satisfied with the time allocated for each counseling session (average score = 4.44). As the nature of the question on the original instrument was not specific to the appropriateness of the duration of the session, more detailed questioning may be needed to elicit such information.
22	Participants were selected based on frequency of prescribing antimicrobial medications, which included residents, paediatric fellows and PEM attending physicians. Certain inpatient advanced practitioner nurses and physician assistants were also invited.	Survey was sent to participants using institutional email addresses. A reminder email was sent out 2 weeks after the original email.	The data obtained by Survey Monkey were analysed in Stata v11. Descriptive analyses were performed, and statistical tests utilised included the Kruskal-Wallis test and Mann Whitney U test. A P value of 0.05 was used as representative of statistical significance.	The effectiveness of an ASP relies heavily on behaviour change by prescribing clinicians. This study found that interventions such as real-time feedback and other educational interventions were well received. Respondents reported positive experiences with specific aspects of the ASP, including prospective audit and real-time feedback, required pre-authorisation and indication for Rx of antimicrobials, CPOE order sets and ID pharmacist.
23	Participation at a senior level in a pharmacy or rheumatology organisation.	Stakeholders were sent a briefing note prior to the telephone interview. It combined “Arthriting” blog quotes, innovative pharmacist case studies, and an interim analysis of phase 1 FGs (with pharmacists).	A framework approach was used for telephone interview analysis. Each respondent had chosen his priority pharmacy roles. The responses were summarised by one of the interviewers and were independently reviewed by the project manager. Consistency within and between phases was monitored to assess the trustworthiness of the findings.	The development of generic healthcare skills among young people was a strong theme across the phases, reflected by rheumatologist. Many young people with chronic illnesses are seen in hospital outpatient clinics rather than inpatient wards; pharmacists are not traditionally involved in these clinics but there was openness to include them. Other rheumatologists described innovation with pharmacists. One centre had a pharmacist prescribing methotrexate in clinic. Another team had a dedicated pharmacist attached to their group, who answered the team’s queries but did not attend clinic.

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24	Moadebi SM (University of British Columbia)	2013	Canada	To measure the impact of the interprofessional collaboration and educational sessions conducted by the clinical pharmacist on ED nurses' level of comfort and satisfaction with intranasal fentanyl for children.	A protocol for administering intranasal fentanyl for children age 1–15 years with acute pain was introduced to the ED Nursing staff by an educational session conducted by a clinical pharmacist. Nurses' level of satisfaction and comfort was surveyed prior to and following IPE. Compliance with patient monitoring was determined by chart review .	Multi-methods	Lions Gate Hospital, a 335-bed acute care community teaching hospital. Paediatric visits contribute to approximately 20% of all visits.	All nurses working in the site's ED. The ED Clinical Nurse Educator assigned staff nurses to attend the education classes who were employed full time at our 24 acute bed and minor care ED. A total of 71 nurses were included in the study. The majority of the nurses who responded to the practice assessment had over 5 years of nursing experience.	Not specified.
25	Rishoej RM (Department of Public Health, University of Southern Denmark)	2018	Denmark	To explore current and potential future practices to prevent medication errors experienced by physicians and nurses.	2 FGs, one including physicians and one including nurses were conducted at each NICU (total: 6 FGs). A min of 3 participants to a max of 6 per FG.	Qualitative	3 largest tertiary NICUs. All units were involved in the complex treatment of extremely premature neonates and other newborns with severe complications.	3 nurses FGs with 3, 3 and 6 participants; 3 physicians FGs with 3,4 and 4 participants.	Local project managers emailed information about the study prior to FGs.
26	Rosenfeld MPH (University of Melbourne)	2018	Australia	To examine interdisciplinary medication decision making by pharmacists in paediatric hospital settings.	An ethnographic design comprising observation, SSIs and FGs.	Qualitative	A major Australian paediatric teaching hospital.	Pharmacists, registered nurses and doctors from diverse clinical wards.	Not specified.

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24	The sample group included all Emergency Department staff nurses who completed the educational session.	Participants were recruited in a formal educational presentation by clinical pharmacist. Nurses' experience with intranasal fentanyl was assessed by questionnaire before the educational presentation. Those nurses identified with past experience were asked to rate their satisfaction or comfort level with a five-point Likert scale. An online survey using Survey Monkey was administered post educational intervention to evaluate satisfaction and comfort with administrating intranasal fentanyl. Content validity was established by the expert judging panel (two pharmacists and one nurse) reviewing each survey question as essential items measuring skill or knowledge. Item clarity was assessed in pilot testing and minor changes to wording were addressed.	Statistics on the Likert scale questionnaire items were computed, including means, standard deviations (SDs) and significance values ($p < 0.05$). The significant differences in comfort level between intranasal fentanyl and intravenous morphine in the nursing group based on practice were assessed using a paired student t-test. Confidence intervals were calculated using the GraphPadQuickCalcs. The level of significance was set at $p < 0.05$. The Cronbach's alpha coefficient calculated by Excel setting the benchmark alpha level <0.70.	Nurses reported a high level of understanding of medication dose and monitoring schedule (4.15 ± 0.89; 3.8–4.5) and side effects (3.98 ± 0.90; 3.6–4.2). Most nurses felt very comfortable with intranasal fentanyl administration but there was increased comfort with intravenous morphine (83% versus 98%, $p < 0.05$). Nurses rated high level of satisfaction the written medication handout (80%). This educational intervention was provided by the team of nurse educator and hospital clinical pharmacist to improve nurse practice acceptance with the launch of intranasal fentanyl. The proximity of the pharmacist to the department allows for direct consultation and medication review by the pharmacist. Furthermore, the pharmacist's participation in educational in-services two days per week has helped to alleviate the nurse educator workload allowing more time to implement new educational programs in the ED. Authors expected the availability of a clinical pharmacist in the department would decrease barriers for using intranasal fentanyl.
25	NICU physicians and nurses were eligible to participant if they had at least 1 month of work experience at the NICU and provided direct patient care.	During each FG, participants were asked to express their attitudes towards discussing prevention of MEs. Next, a poster was presented to the participants (with factors influencing ME identified through literature search) and was asked: i) how do you current prevent ME from occurring? ii) how can we become better at preventing MEs?	Using content analysis. 3 coders were involved. 2 coders predefined categories and colour-codes to be used. They met after finalising the analyses and evaluated the identified categories in each transcript. A third coder reviewed the final analyses and discusses possible additions of categories. Feedback on the findings was provided by 3 local project managers.	One theme emerged from the FGs was hospital pharmacy services. Nurses generally considered iv antibiotics prepared by the pharmacy safer than medication preparation conducted by nurses and felt that it decreased nurses' workload and interruptions. However, nurses in one group expressed that they did not feel safe trusting unknown pharmacy staff to prepare medication; furthermore, limited opening hours of pharmacy service raised a concern, as 24-hour service was considered necessary. Physicians in one group considered clinical pharmacists effective at improving medication safety. A clinical pharmacist had previously conducted medication reviews and reviewed medication safety procedures but the service was not implemented. Physicians suggested reinvesting in a clinical pharmacist to strengthen medication safety in the future.
26	Inclusion criteria for the sample involved pharmacists, nurses and doctors who were recruited from diverse wards including. Children cared for by these health professionals therefore had a diverse range of conditions in relation to these various ward settings. Exclusion criteria included nurses who had only completed a one-year course and therefore had no medication responsibilities, and health professionals who were not employees of the hospital.	The study was conducted from March 2014 to February 2016. Participants were recruited following the conduct of information sessions with the pharmacy department and ward managers. Thehealth professionals recruited for the study worked together with other health professionals situated in the same ward. However, health professionals were recruited as individuals.	Data were thematically analyzed according to the 'framework' approach. Through social action, the experiences of individuals are examined and interpreted in terms of the demands, constraints and enablers affecting health care practice. Transcription was undertaken by the researchers who conducted observations. Field notes were consulted for context. Data were repeatedly scrutinisedin an iterative process to identify major themes. Resultswere reviewed by three researchers for concordance. FGs of nurses and pharmacists were then conducted to gain feedback on the themes obtained, to enable further refinement of themes, and to verify that no important information had been omitted.	Three interdisciplinary medication decision themes were identified. These themes were: pharmacists' role in interdisciplinary complex medication decisions; factors facilitating pharmacists' involvement with other health professionals in medication decisions; and challenges impeding pharmacists' ability to make medication decisions. Pharmacists were integral to medication decision making, which included complex medication decision making, involving off-label prescribing, clarifying administration issues when protocols were absent or ambiguous, mediating administration conundrums between patient safety and inflexible protocol adherence, and maintaining heightened vigilance when patients received multiple medications. Facilitators in decision making comprised strong relationships among pharmacists,doctors and nurses, thereby enabling communication, and having a culture that supported open disclosure of medication errors. Challenges in decision making related to the lack of availability of pharmacists in the emergency department, limited after-hours pharmacy staff, and competing responsibilities for the conduct of discharge interviews and dispensing, with case note review.