Table 1. **Summary of twenty studies describing antimicrobial stewardship strategies in the Middle East (*continued*)**

Study	Country	Design	Setting (No. of patients)	Evaluated component	Comparator	Outcome	Recommendations
Zeenny et al. 2014	Lebanon	Retrospective evaluation of patient medical records	Hospital (185)	Appropriateness of use of a broad-spectrum antibiotic	Compliance with IDSA guidelines	Justified prescription for the intended use in general; antimicrobial cycling and scheduled antimicrobial switch (86% of the cases with p=0.028); Inappropriateness in dosing frequency and dosage adjustment in patients with renal failure (34.1% inappropriateness mainly due to inappropriate dose adjustment with P < 0.05)	Highlighting upon the importance of the role of a clinical pharmacist and his crucial presence in every hospital ward for dosage and frequency adjustment when necessary; Implementation of clinical pharmacists' interventions; Continuing education activities/ in-services to the medical team; Mandatory supervision of antibiotic use by infectious disease specialists; Development of local antimicrobial stewardship programme
John et al. 2014	United Arab Emirates	Prospective cross-sectional review of medical records	Hospital (238)	Appropriateness of antimicrobial prescribing patterns of physicians	Compliance with WHO guidelines for upper respiratory tract infections	Rational practices in prescribing antibiotics	Encouragement of continuous use of therapeutic guidelines based on sensitivity patterns to optimize the use of antimicrobial agents
Kabbara et al. 2015a	Lebanon	Prospective observation and evaluation of electronic charts	Hospital (118)	Appropriateness of use of fluoroquinolones	Compliance with IDSA guidelines, manufacturer package inserts and clinical judgment	Appropriate prescriptions for intended use (93.2%); Inappropriateness in duration of therapy (57.6%) and dosage adjustment in renal failure patients (57.1%)	Highlighting upon the importance of the role of a clinical pharmacist in de-escalating treatment when indicated post-culture results and in sparing the use of broad-spectrum fluoroquinolones
Rehmani et al. 2014	Saudi Arabia	Quasi-experimental prospective study	Hospital (159)	Appropriateness of initial antibiotic therapy and time from recognition of severe sepsis/septic shock to first antibiotic dose delivery	Compliance with local empiric antibiotic guidelines; locally written sepsis protocol (pre/post intervention)	Improved timing and appropriateness of initial empiric antimicrobial therapy (overall reduction of 72 minutes from time severe sepsis is recognized to delivery of antibiotics); improvement by 37% in antibiotic use post-protocol implementation	Encouragement of the continuous use of local protocols and local microbiological data whilst trying to activate the protocol during the early "triage" phase