

Additional file 6: Overview of determinants addressed, study methods, and description of quality assessment in the 41 studies reviewed

Study (Year) ^{no.}	Strategy Determinants addressed	Methods Design	Setting (n)	Target population	Unit of analysis(n) ^s	Quality assessment Ranking and limitations
Berg (1995) ³³	Knowledge, Awareness, Self-efficacy, Action control	UBA	Medical/surgical ICU (1)	NS	HH Opportunities (677) Before (251) After (426)	4: Moderate Uncontrolled design, rater procedure not described, test statistics not described
Brock (2002) ³⁴	Awareness	RCT	Study: Emergency care (1) Control: ICU (1)	Nurses Technical staff	Participants (90) Study (45 nurses) Control (45 nurses)	5: Moderate Obtrusive observations, rater procedure not described
Brown (2003) ³⁵	Knowledge, Awareness, Social influence, Self-efficacy, Intention, Action control, Facilities	UBA	NICU (1)	Nurses Physicians Other HCWs	HH Opportunities (606) Before (283) After (323)	4: Moderate Uncontrolled design, sample size described but not justified, rater procedure not described
Conly (1989) ³⁶	Knowledge, Awareness, Social influence, Attitude, Action control	UBA	Medical ICU (1)	Nurses Physicians Other HCWs	HH Opportunities (211) Before (122) After period (99)	4: Moderate Uncontrolled design, sample size described but not justified, rater procedure not described
Creedon (2006) ³⁷	Knowledge, Awareness, Action control, Facilities	UBA	Medical/surgical ICU (1)	Nurses Physicians Other HCWs	HH Opportunities (314) Before (152) After (162)	4: Moderate Uncontrolled design, obtrusive observations, rater procedure not described
Dorsey (1996) ³⁸	Knowledge, Action control	UBA	Emergency department (1)	Nurses Physicians Other HCWs	HH Opportunities (252) Before (132) After (120)	4: Moderate Uncontrolled design, sample size described but not justified/rater procedure not described
Duerink (2006) ³⁹	Knowledge, Awareness, Self-efficacy, Action control, Facilities	CBA	Study: Medical internal ward (1) Paediatric ward (1) Control: Gynaecology ward (1)	NS	HH Opportunities (7160) Study (5005) Control (2155)	5: Moderate sample size not described, rater procedure not described
Earl (2001) ⁴⁰	Facilitation of behaviour	UBA	Medical ICU (1) Surgical ICU (1)	Nurses Physicians Other HCWs	HH Opportunities (2181) Before (1090) After (1091)	4: Moderate Uncontrolled design, sample size described but not justified, rater procedure not described
Eldridge (2006) ⁴¹	Knowledge, Awareness, Social influence, Action control, Facilities	UBA	3 Medical centres ICU (4)	Nurses Physicians Other HCWs	HH Opportunities (4103) Before (2338) After (1762)	4: Moderate Uncontrolled design, obtrusive observations, rater procedure not

Giannitsioti (2009) ⁴²	Facilitation of behaviour	UBA	Medical ward (1)	Nurses Physicians Other HCWs	HH Opportunities (299) Before (207) After (92)	described 4: Moderate Uncontrolled design, sample size described but not justified, rater procedure not described
Golan (2006) ⁴³	Action control	Cross-over	Medical ICU (1) Surgical ICU (1)	Nurses Physicians Other HCWs	HH Opportunities (1619) Medical ICU (998) Surgical ICU (621)	6: high rater procedure not described
Gould (1997) ⁴⁴	Knowledge, Awareness, Attitude, Self-efficacy, Facilities	CBA	Study: Surgical wards (2) Control: Surgical wards (2)	Nurses	Participants Study (16) Control (15)	4: Moderate Sample size described but not justified, obtrusive observations, rater procedure not described
Haas (2008) ⁴⁵	Facilitation of behaviour	UBA	Emergency department (1)	Nurses Physicians Other HCWs	HH Opportunities (757) Before NS After NS	4: Moderate Uncontrolled design, obtrusive observations, rater procedure not described
Harbarth (2002) ⁴⁶	Knowledge, Awareness, Social influence, Attitude, Action control, Facilities	UBA	General PICU (1), Cardiac ICU (1), NICU (1)	Nurses Physicians Other HCWs	HH Opportunities (12,216)	5: Moderate Uncontrolled design, sample size described but not justified
Howard (2009) ⁴⁷	Knowledge, Awareness, Action control	UBA	Surgical ward (4) Emergency department (1)	Nurses Physicians Other HCWs	Patients Before (85 patients) After (74 patients)	4: Moderate Uncontrolled design, sample size described but not justified, rater procedure not described
Huang (2002) ⁴⁸	Knowledge, Awareness, Self-efficacy	RCT	All hospital departments	Nurses	Participants (98) Study (49 nurses) Control (49 nurses)	4: Moderate Sample size described but not justified, obtrusive observations, rater procedure not described
Khatib (1999) ⁴⁹	Action control	UBA	ICU (1)	NS	HH Opportunities (1080) Before (537) After (543)	3: Moderate Uncontrolled design, sample size described but not justified, rater procedure not described, test statistics not described
Lam (2004) ⁵⁰	Knowledge, Attitude, Self-efficacy, Action control, Facilities	UBA	NICU (1)	Nurses Physicians Other HCWs	HH Opportunities (983) Before (666) After (317)	4: Moderate Uncontrolled design, sample size described but not justified, rater procedure not described
Larson (1991) ⁵¹	Knowledge, Facilities	UBA	NICU* (1) Recovery unit (1)	Nurses Physicians Other HCWs	HH Opportunities (1610) Automatic sink (615) Manual sink (995)	4: Moderate Uncontrolled design, sample size described but not justified, obtrusive

Larson (1997) ⁵²	Knowledge, Awareness, Social influence, Facilities	CBA	Study: Neurosurgical ICU (1) Control: Surgical ICU (1)	Nurses	HH Opportunities (1983) Study (991) Control (992)	observations but rater procedure described 6: High Sample size described but not justified
Larson (2000) ⁵³	Knowledge, Awareness, Social influence, Attitude, Self-efficacy, Intention, Action control	CBA	Study: 1 hospital Medical ICU (1) NICU (1) Control: 1 hospital Medical ICU (1) NICU (1)	NS	Number of dispenser activations (860,567) Study (477,680) Control (382,887)	4: Moderate Sample size described but not justified, adherence measured by used volume of soap or hand alcohol
Larson (2005) ⁵⁴	Facilitation of behaviour	Cross-over	Paediatric emergency department (1) PICU (1)	NS	HH Opportunities (5568)	6: High Obtrusive observations but rater procedure described
Marra (2008) ⁵⁵	Awareness, Social influence, Self-efficacy, Intention	CBA	Study: step-down unit (1) Control: step-down unit (1)	HCWs (NS)	HH episodes by electronic counting device (228,297) study (117,579) Control (110,718)	4: Moderate Sample size described but not justified, adherence measured by electronic counting device
Mayer (1986) ⁵⁶	Knowledge, Awareness, Facilities	CBA	Study: ICU (1) Control: ICU (1)	Nurses	HH opportunities (834) Study (610) Control (224)	6: High Sample size described but not justified
Moongtui (2000) ⁵⁷	Awareness, Social influence	RCT	Emergency department (1) Randomisation of nurses	Nurses Other HCWs	Participants (91) Study (36) Control (55)	6: High Rater procedure not described
Muto (2000) ⁵⁸	Knowledge, Self-efficacy, Action control, Facilities	UBA	Medical ward (1) Medical ICU (1)	Nurses Physicians Other HCWs	HH Opportunities (239) Before (126) After (113)	3: Moderate Uncontrolled design, rater procedure not described, test statistics not described
Picheansathian (2008) ⁵⁹	Knowledge, Awareness, Action control, Facilities	UBA	PICU (1)	Nurses	HH Opportunities (1245) Before (320) After (925)	4: Moderate Uncontrolled design, sample size described but not justified, obtrusive observations, rater procedure described
Pittet (2000) ¹	Knowledge, Awareness, Social influence, Action control, Facilities	UBA	All hospital wards	Nurses Physicians Other HCWs	HH Opportunities (5403) Before (2834) After (2569)	5: Moderate Uncontrolled design, sample size described but not justified
Raju (1991) ⁶⁰	Knowledge, Awareness, Attitude	UBA	NICU (1)	Nurses Physicians	HH Opportunities (412) Before (257)	4: Moderate Uncontrolled design, sample size

Raskind (2007) ⁶¹	Knowledge, Intention, Action control	UBA	PICU (1)	Nurses Physicians Other HCWs Administrative personnel, Family and visitors	After (155) HH Opportunities (401) Before (189) After (212)	described but not justified, rater procedure not described 4: Moderate Uncontrolled design, sample size described but not justified, rater procedure not described
Rupp (2007) ⁶²	Knowledge, Action control, Facilities	Cross-over	ICU A/B	Nurses physicians other HCWs	HH Opportunities (3678)	5: Moderate Sample size described but not justified, rater procedure not described
Santana (2007) ⁶³	Knowledge, Action control, Facilities	UBA	ICU (1)	Nurses Physicians Other HCWs	HH Opportunities (3476) Before (2032) After (1444)	4: Moderate Uncontrolled design, sample size described but not justified, rater procedure not described
Sharek (2002) ⁶⁴	Knowledge, Awareness, Action control	UBA	NICU (1)	Nurses Physicians Other HCWs	Participants (46)	4: Moderate Uncontrolled design, sample size described but not justified, rater procedure not described
Simmons (1990) ⁶⁵	Knowledge, Awareness, Social influence, Attitude, Action control	UBA	Surgical ICU (1) Medical ICU (1)	Nurses Physicians Other HCWs	HH Opportunities (485) Before (257) After (155)	4: Moderate Uncontrolled design, sample size described but not justified, rater procedure not described
Slota (2001) ⁶⁶	Knowledge, Action control	UBA	PICU (1)	NS	HH Opportunities (350) Before and after numbers NS	4: Moderate Uncontrolled design, sample size described but not justified, rater procedure not described
Trick (2006) ⁶⁷	Knowledge, Awareness, Attitude, Action control, Facilities	CBA	Multicentre (4) study: 3 hospitals Medical ward (2) Surgical ward (1) ICU/PICU (5) Skilled care (1) Control: 3 hospitals ICU/PICU (2) Rehabilitation ward (1)	Nurses Physicians Other HCWs	HH Opportunities (6948) Study (5206) Control (1742)	6: High Sample size described but not justified
v/d Mortel	Awareness, Action control	UBA	NICU (1)	Nurses	HH Opportunities (893)	4: Moderate

(1995) ⁶⁸			High care (1)	Physicians Other HCWs	Before (303) After (590)	Uncontrolled design, sample size described but not justified, rater procedure not described
v/d Mortel (2000) ⁶⁹	Awareness	UBA	ICU (1) High care (1)	Nurses Physicians Other HCWs	HH Opportunities (542) Before (143) After (399)	4: Moderate Uncontrolled design, sample size described but not justified, rater procedure not described
Whitby (2004) ⁷⁰	Facilitation of behaviour	UBA	Internal medical ward (1) PICU (1) Infectious diseases ward (1) Urology ward (1)	Nurses	HH Opportunities (8146) Before (4001) After (4145)	4: Moderate Uncontrolled design, sample size described but not justified, rater procedure not described
Won (2004) ⁷¹	Knowledge, Awareness, Attitude, Action control, Facilities	UBA	NICU (1)	Nurses Physicians Other HCWs	HH Opportunities NS (312 observation periods) Before NS After NS	4: Moderate Uncontrolled design, sample size not described, rater procedure not described
Zerr (2005) ⁷²	Knowledge, Awareness, Social influence, Attitude, Self-efficacy, Action control, Facilities	UBA	Paediatric ward (1) Surgical ward (1)	Nurses Physicians Other HCWs	HH Opportunities (1526) Before (958) After (568)	4: Moderate Uncontrolled design, sample size described but not justified, rater procedure not described

CBA = Controlled before-and-after study, HH = hand hygiene, HCWs = healthcare workers, ICU = intensive care unit, NICU = neonatal intensive care unit, NS = , PICU = paediatric intensive care unit, UBA = uncontrolled before-and-after study,

[§]Numbers are calculated from baseline data and data derived directly