Table 1. Study characteristics of the included studies

Author	Setting	Type	Location	Difficult accessible patients yes/no?	PICO
Airapetian (2013)	Intensive care unit	Central venous catheter	Jugular and femoral vein	No information	1
Benali (2022)	Intensive care unit	Central venous catheter	Subclavian vein	Benali (2022) makes a distinction in outcomes for patients with a BMI higher and lower than 30. Benali (2022) also reports outcomes for both groups combined.	1
Dolu (2015)	Not reported	Central venous catheter	Jugular vein	Overweight patients (mean BMI is 26.6 kg/m2 vs. 25.7 kg/m2.	1
Ehtesham (2020)	Not reported	Central venous catheter	Jugular vein	No information	1
Faithi (2016)	Surgical ward of a general hospital	Central venous catheter	Jugular vein	No information	1
Nazari (2015)	Not reported	Central venous catheter	Jugular vein	No information	1
Palkhiwala (2020)	Not reported	Central venous catheter	Jugular vein	No information	1
Rando (2014)	Intensive care unit	Central venous catheter	Jugular vein	46/123 patients undergoing US guidance placement had DIVA compared to 37/134 patients undergoing landmark-based placement.	1
Riaz (2015)	Not reported	Central venous catheter	Jugular vein	No information	1
Srinivasan (2017)	Intensive care unit	Central venous catheter	Jugular vein	No information	1
Subramony (2022)	Urban tertiary teaching hospital	Central venous catheter	Subclavian vein	No information	1

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Vinayagamurugan (2021)	Tertiary care university hospital	Central venous catheter	Jugular vein	No information	1
Wang (2020)	Intensive care unit	Central venous catheter	Subclavian vein	No information	1
Oh (2014)	Not reported	Central venous catheter	Subclavian vein	No information	1
Zhang (2023)	Not reported	Central venous catheter	Subclavian vein	No information	1
Yalcinli (2022)	Tertiary care hospital	Peripheral intravenous catheter	No information	Yalcinli (2022) investigated patients with difficult intravenous access, defined as: history (>two trial histories during vascular access on a previous visit), with no visible or palpable veins on the upper extremity, and who were assessed to have a difficult procedure by the senior nurse.	2
Tada (2022)	Aponte (2007): Operating room Bahl (2016): Emergency department Bridey (2018): Intensive care unit Keforne (2012): Intensive care unit	Peripheral intravenous catheter	No information	Ten RCTs from Tada (2022) investigated patients with difficult intravenous access, defined as: - **Aponte (2007)**: participants reported past difficulties or anaesthesia providers identified them as having the potential for difficulty. - **Bahl (2016)**: participants reported past difficulties or experienced at least one previous episode where at least 2 attempts were required to obtain a peripheral IV. - **Bridey (2018)**: could not see and palpate a vein. - **Keforne (2012):** an operator could not see and palpate the targeted vein. - **McCarthy (2016)**: could not see or palpate a vein. - **Nishizawa (2020)**: at least 2 failed attempts with LM, or at least 2 experienced nurses anticipated difficulty with LM based on the absence of a palpable vein or a history of difficult IV cannulation. - **Stein (2009)**: at least 2 failed attempts with LM. - **Weiner (2013)**: had a history of difficult IV cannulation, or at least 2 failed attempts with LM.	2

McCarthy (2016):
Emergency
department

Nishizawa (2020):
Intensive care unit

Stein (2009):
Emergency
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Weiner (2013):
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LM: landmark-based approach

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