A systematic review of methods to measure menstrual blood loss

SUPPLEMENTAL TABLE 5

Correlations of methods with established standards.

Author and year (reference)	Method	Study population	N (n)[a]	Correlated variable (reference)	r	P value	κ
AH							
Hallberg & Nilsson, 1964 [1]	AH	Healthy women	1 (1)	Iron isotope activity method over three portions of a period	Good agreement	–	–
Measurement of iron/labelled red blood cells							
Napolitano et al., 2014 [2]	Menstrual iron loss	Women with normal or confirmed heavy MBL	105 (105)	MFL	0.789	<.001	–
MFL, duration of menses, number of pads							
Magnay et al., 2014 [3]	Duration of menses	Women with self-perceived light, normal, or heavy MBL	119 (235)	AH [4]	No correlation No correlation	–	–
	No. of sanitary items			AH [4]	0.97	–	–
	MFL			AH [4]		<.0001	
Schumacher et al., 2012 [5]	MBL estimated from MFL	Women with confirmed heavy MBL	162 (648)	AH [1,6]	0.73	<.0001	–
Gudmundsdottir et al., 2009 [7]	MFL	Women and adolescents with self-perceived normal or heavy MBL, or diagnosed heavy MBL	113 (113)	Subjective MBL	Correlation	–	–
Reid & Virtanen-Kari, 2005 [8]	Total MFL	Women with confirmed heavy MBL (MBL ≥80 mL)	42 (126)	Change in MBL [6]	0.88	<.0001	–
Warner et al., 2004 [9]	Total number of pads/tampons	Women with self-perceived menstrual complaint	226 (225)	AH [1]	0.30	<.001	–
Wyatt et al., 2001 [10]	Number of sanitary items	Women with self-perceived normal or heavy MBL	108 (108)	AH [1]	No overall correlation	–	–
Fraser et al.,	Total log MFL	Women with self-perceived	53 (106)	AH (log MBL) [1,6]	0.93	<.001	–

Author and year (reference)	Method	Study population	N (n)[a]	Correlated variable (reference)	r	P value	κ
2001 [11]		normal or heavy MBL					
Higham & Shaw, 1999 [12]	Duration of menses Number of sanitary items	Women with self-perceived normal or heavy MBL	254 (420) (412)	AH [1]	0.35 0.61	<.01 <.005	–
Vasilenko et al.,1988 [13]	Pad and tampon counts	Women with normal MBL or abnormal MBL	10 (35)	Modified AH method [13]	No correlation	–	–
Fraser et al., 1984 [14]	Pad and tampon counts	Women with self-perceived heavy MBL	60 (240)	AH [1,6]	No relationship	Non-significant	–
Baldwin et al., 1961 [15]	Duration of period	Women with self-perceived normal or heavy MBL	26 (67)	MBL determined by Fe^{59}	No relationship	–	–
PBAC							
Zakherah et al., 2011 [16]	PBAC (SAP version)	Women with self-perceived normal or heavy MBL	197 (241)	AH [1,17]	0.60	<.001	–
Reid & Virtanen-Kari, 2005 [8]	PBAC	Women with confirmed heavy MBL (MBL ≥80 mL)	42 (126)	Change in MBL Total MFL	0.53 0.58	.0007 .0002	– –
Reid et al., 2000 [18]	PBAC	Women with self-perceived heavy MBL	103 (103)	AH [1]	0.4659	–	–
Deeny et al., 1994 [19]	PBAC	Women with dysfunctional uterine bleeding	53 (53)	AH [1]	–	.001	–
Higham et al., 1990 [20]	PBAC	Women with a range of MBL	28 (self-assessed, 55; expert-assessed, 122)	AH [1]	0.847 (self) 0.872 (expert)	– –	– –
Menstrual pictogram							
Magnay et al., 2014 [3]	Menstrual pictogram (SAP version)	Women with self-perceived light, normal, or heavy MBL	119 (235)	MFL AH [4]	0.85 0.81	<.0001 <.0001	– –
Larsen et al., 2013 [21]	Modified menstrual pictogram (revised icons and excluding extraneous blood)	Women with confirmed heavy menstrual bleeding	87 (87)	Change in AH from baseline [1,6]	0.86 (estimate)	–	0.88 (classification)

Author and year (reference)	Method	Study population	N (n)[a]	Correlated variable (reference)	r	P value	κ
Wyatt et al., 2002 [22]	Menstrual pictogram Symptometrics device	Women with self-perceived normal or heavy MBL	20 (20)	AH [1]	–	<.00001	0.80
Wyatt et al., 2001 [10]	Menstrual pictogram	Women with self-perceived normal or heavy MBL	108 (108)	AH [1]	Good agreement	–	0.8
Methods involving self-perception of MBL							
Matteson et al., 2015 [23]	MBQ	Women with self-perceived normal and heavy MBL	67 (–)	SF-36	–0.15 to –0.45	.2 to .0001	–
Toxqui et al., 2014 [24]	MBL score	Women with self-perceived normal MBL	165 (–)	Log ferritin Platelet count	Negative association	.006 .011	– –
Bushnell et al., 2010 [25]	MIQ	Women with self-perceived normal MBL or diagnosed heavy MBL	262 (655)	AH	0.3–0.4	<.001	–
de Souza et al., 2010 [26]	SF-36	Women with heavy MBL (>80 mL for ≥3 months)	58 (58)	Physical composite vs PBAC Mental composite vs PBAC Physical composite vs hemoglobin level Mental composite vs hemoglobin level	0.166 0.063 0.307 0.293	.222 .642 .020 .027	– – – –
Pawar et al., 2008 [27]	Quality of life questionnaire	Adolescent women	45 (–)	PBAC	–	<.025	–
Mansfield et al., 2004 [28]	MVJ scale	Women menstruating	31 (89)	Log discharge rate Individual MFL (n = 26)	0.683 0.480–0.894	– –	– –
Heath et al., 1999 [29]	Menstrual record Menstrual recall questionnaires	Young adult women	29 (29)	MFL (weighed menstrual loss)	0.47 0.61	.012 .001	– –

[a]N = study population size; n = number of cycles studied.

AH = alkaline hematin; MBL = menstrual blood loss; MBQ = menstrual bleeding questionnaire; MFL = menstrual fluid loss; MIQ = Menorrhagia Impact Questionnaire; MVJ = Mansfield–Voda–Jorgensen Menstrual Bleeding Scale; PBAC = pictorial blood loss assessment chart; SAP = superabsorbent polymer; SF-36 = Medical Outcomes Study 36-item Short Form Health Survey.

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