

RELIABILITY & REPRODUCIBILITY OF HEMAVIEW™ LIVE BLOOD ASSESSMENT USING DARKFIELD MICROSCOPY

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BACKGROUND INFORMATION

Hemaview™ live blood assessment using darkfield microscopy (LBA-DM) is a point-of-care clinical screening tool used predominantly by integrative and complementary healthcare practitioners. The purpose of this study was to assess the reliability and reproducibility of practitioners' identification and interpretation of LBA-DM parameters.

Establishing reliability and reproducibility is the first step in determining validity of an assessment method or tool. When there is a high level of both reliability and reproducibility the method can be considered sound.

- Reliability refers to the consistency of measurement or observations recorded by multiple practitioners.
- Reproducibility concerns the consistency of observations made by a single practitioner.

METHOD

Thirty-three trained Hemaview™ Practitioners were asked to review a series of images of live blood taken during Hemaview™ LBA-DM assessments. A small group of Hemaview™ Experts (n=3) were assessed in an identical manner. A repeat test of one patient formed the reproducibility aspect of the study. These practitioners and experts were asked to note what signs they observed and to evaluate the patients' likely health status. They were not made aware of patients' case histories and were therefore effectively blinded.

Data was then analysed and a statistical tool called Cohen's kappa was used to quantify reliability and reproducibility. Results were compared to the Landis & Koch grading scale (see Table One).

Table One: Landis & Koch's grading scale for evaluating reliability and reproducibility.

Kappa	Agreement
< 0.00	Less than chance agreement
0.01 - 0.20	Slight agreement
0.21 - 0.40	Fair agreement
0.41 - 0.60	Moderate agreement
0.61 - 0.80	Substantial agreement
0.81 - 0.99	Almost perfect agreement

RESEARCH FINDINGS

1. Reliability of Hemaview™ was Moderate.

- This part of the study looked at how consistently Hemaview™ Practitioners could correctly identify Hemaview™ parameters in photos of a patient's blood.
- Practitioner reliability for parameter identification reached a Moderate agreement level ($\kappa=0.47$).
- All participants achieved higher levels of agreement than that expected by chance alone, indicating that Hemaview™ assessment was moderately reliable within the study group.

2. Reproducibility of Hemaview™ was Substantial.

- This part of the study looked at how consistently Hemaview™ Practitioners could correctly identify Hemaview™ parameters when shown photos of a patient's blood repeatedly.
- Practitioner reproducibility was Substantial ($\kappa=0.69$).
- This suggests that the test-retest reproducibility of Hemaview™ assessment was substantial within the cohort tested.

RESEARCH FINDINGS ...CONTINUED...

3. Reproducibility of Hemaview™ amongst the Experts was Almost Perfect.

- This part of the study looked at how consistently Hemaview™ Experts (i.e. people who had been practicing Hemaview for a significant amount of time) could correctly identify Hemaview™ parameters when shown photos of a patient's blood repeatedly.
- Expert reproducibility was Almost Perfect ($\kappa=0.92$).
- This demonstrates that increased experience in the field improves Hemaview™ reproducibility.

4. Reproducibility increases as more training is attended.

- This part of the study looked at the relationship between reproducibility and the number of Hemaview™ Advanced trainings subjects had attended.
- Significant positive correlations were found between Practitioner proficiency and ongoing training in the method ($r=0.41$, $p<0.05$) – see Figure One.
- This demonstrates that ongoing training in Hemaview™ improves reproducibility.

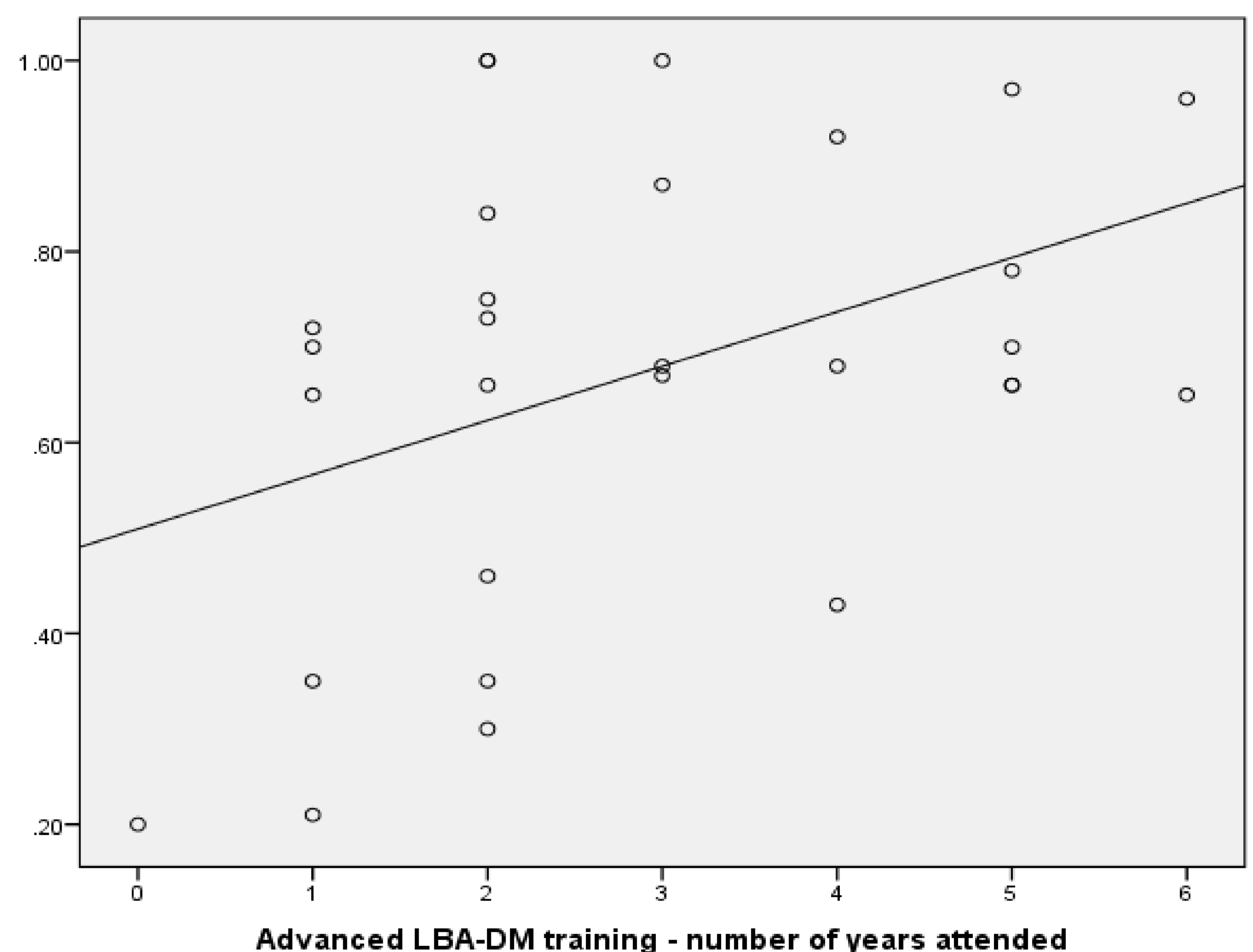


Figure One: Scatterplot of participants' reproducibility scores and the number of years that Advanced training has been attended ($r=0.41$, $p<0.05$).

CONCLUSIONS

The aggregated results from this study indicate moderate reliability and substantial reproducibility. This study has also shown that the level of skill, confidence and expertise in Hemaview™ LBA-DM is variable. Based on these findings the author states:

“...it may be prudent to periodically test the skills of [Hemaview™] LBA-DM practitioners in order to identify those in need of additional support. This could be achieved through a short online survey and would enable targeted training to be provided, thereby raising the overall level of proficiency for practitioners.”

REFERENCES

Vigar, V. 2013. Inter-rater and intra-rater reliability of live blood analysis using darkfield microscopy. Honours thesis – Southern Cross University, Lismore (NSW).