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Wireless Device Use and Fertility in Jamaican Males

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1 Introduction

Male factor infertility has a crippling impact on relationships and perceptions of male self-worth. There has been a worldwide increase in male factor infertility which is a growing concern.

With the pervasive use of wireless technology, more researchers are investigating the impact of wireless device use and its impact on male fertility.

This study aimed to assess the impact of wireless device usage on the total motile sperm parameters (volume, count, motility) in Jamaican males being investigated for infertility at the Hugh Wynter Fertility Management Unit (HWFMU).

2 Methods

A cross-sectional study was conducted on 156 men attending a university-based fertility clinic in Jamaica. No interventions were given to patients and semen samples were collected by masturbation in a sterile container after an abstinence period of 3 days and analysed. All data analyses were done using SPSS Version 26. Preliminary Pearson's chi-squared analyses were performed in order to ascertain independent associations of individual and combined device usage. Adjusted analyses of parameters associated with total motile sperm count (volume, sperm count and motility) across indices of device use (cell phone, laptop, tablet, combined use index), along with previously selected confounders were conducted using multiple regression analysis.

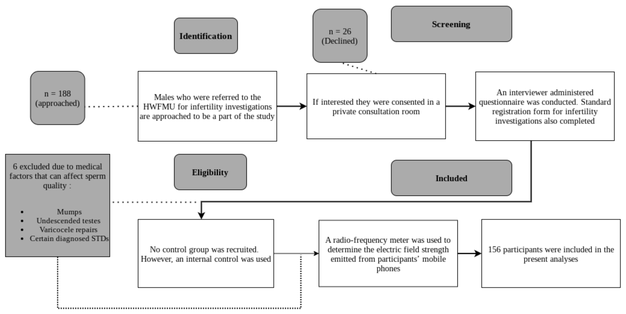

Figure 1 : Flowchart of selecting the study subjects

3 Results

Overall, all participants reported using mobile phones, 64% reported using laptops and 37% reported using tablets.

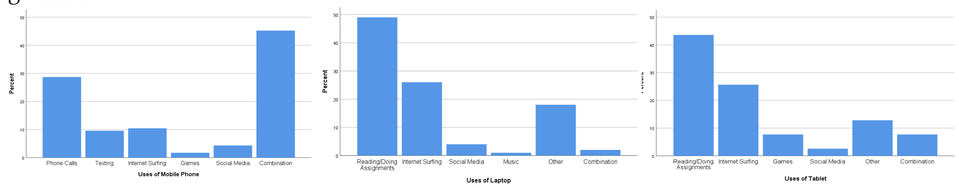

Figure 2 : Uses of Wireless Devices for Sample Population. (a) Mobile Phone, (b) Laptop, (c) Tablet.

Participants who had spent more than 5 hours per day on laptops reported taking a longer time trying to conceive (>3 years) (p = 0.015). Significant differences were noted between normal and abnormal volume and motility with laptop use and the multiple device use index (p = 0.007 and p = 0.005 respectively) (Table 1a and 1b). Results of adjusted regression models showed that persons who used their laptops for 2 to 5 hours were approximately 16 times more likely to have low sperm volume (aOR = 15.89; 95% CI: 2.45-103.26, p = 0.004) (see Table 2).

Table 1a : Percentage difference between normal and abnormal sperm parameters by device use

	Semen Volume			Sperm Count		
	Normal ≥1.5mL (n= 130) %	Abnormal <1.5mL (n= 26) %	p-value	Normal >20 x 10^6 (n=82) %	Abnormal ≤20 x 10^6 (n=72) %	p-value
Frequency of Daily Phone Calls						
Low (≤5 times per day)	42.3	23.1	0.095	37.0	40.3	0.323
Medium (6 – 19 times per day)	26.9	46.2		27.2	34.7	
High (≥20 times per day)	30.8	30.8		35.8	25.0	
Duration of Phone Calls						
Low (≤10 minutes)	40.0	53.8	0.424	42.0	41.7	0.917
Medium (11 – 59 minutes)	43.8	34.6		42.0	44.4	
High (≥60 minutes)	16.2	11.5		16.0	13.9	
Time Spent on Laptop						
Low (<2 hours per day)	46.4	12.5	**0.007***	36.5	45.7	0.325
Medium (2 – 5 hours per day)	8.3	31.3		9.6	15.2	
High (>5 hours per day)	45.2	56.3		53.8	39.1	
Time Spent on Multiple Devices						
Low (<2 hours per day)	5.2	8.3	0.877	8.7	2.4	0.456
Medium (2 – 5 hours per day)	6.5	8.3		6.5	7.3	
High (>5 hours per day)	88.3	83.3		84.8	90.2	

Table 1b : Percentage difference between normal and abnormal sperm parameters by device use

	Total Motile Sperm Count			Sperm Motility		
	Normal >20 x 10^6 (n= 128) %	Abnormal ≤20 x 10^6 (n= 28) %	p-value	Normal ≥40% (n= 100) %	Abnormal <40% (n= 56) %	p-value
Frequency of Daily Phone Calls						
Low (≤5 times per day)	38.6	40.7	0.978	41.7	34.5	0.486
Medium (6 – 19 times per day)	30.7	29.6		27.3	36.4	
High (≥20 times per day)	30.7	29.6		31.3	29.1	
Duration of Phone Calls						
Low (≤10 minutes)	40.2	51.9	0.522	43.4	40.0	0.892
Medium (11 – 59 minutes)	44.1	37.0		42.4	43.6	
High (≥60 minutes)	15.7	11.1		14.1	16.4	
Time Spent on Laptop						
Low (<2 hours per day)	43.2	27.8	0.417	39.7	41.7	0.681
Medium (2 – 5 hours per day)	12.3	11.1		14.3	8.3	
High (>5 hours per day)	44.4	61.2		56.0	50.0	
Time Spent on Multiple Devices						
Low (<2 hours per day)	5.5	6.7	0.080	7.4	2.9	**0.005***
Medium (2 – 5 hours per day)	4.1	20.0		0.0	17.6	
High (>5 hours per day)	90.4	87.5		92.6	79.4	

Table 2 : Adjusted odds ratios for simple logistic regression analyses to identify risk factors for semen parameters

	Abnormal Semen Volume (n=156)			Abnormal Sperm Count (n=154)		
	aOR	95% CI	p-value	aOR	95% CI	p-value
Frequency of Daily Phone Calls						
Low (≤5 times per day)						
Medium (6 – 19 times per day)	2.907	[0.97, 8.70]	**0.056**	1.180	[0.51, 2.73]	0.699
High (≥20 times per day)	1.651	[0.52, 5.28]	0.398	0.546	[0.23, 1.27]	0.161
Duration of Phone Calls						
Low (≤10 minutes)						
Medium (11 – 59 minutes)	0.619	[0.24, 1.59]	0.320	1.098	[0.53, 2.29]	0.804
High (≥60 minutes)	0.708	[0.18, 2.85]	0.627	0.958	[0.34, 2.71]	0.936
Time Spent on Laptop						
Low (<2 hours per day)						
Medium (2 – 5 hours per day)	15.894	[2.45, 103.26]	**0.004***	1.361	[0.33, 5.67]	0.672
High (>5 hours per day)	4.343	[0.87, 21.73]	0.074	0.738	[0.28, 1.94]	0.538

Sperm Parameter : Abnormal Sperm Volume; Abnormal Sperm Count

Adjusted for : Age; Time Trying for Baby, Recreational Drug Use

4 Conclusions

To our knowledge, this is the first study to evaluate the impact of wireless device use on semen quality in the Caribbean.

In persons seeking infertility investigations, we found that longer durations of laptop use corresponded to reduced semen volume. We also found that laptop use was associated with a longer time to conceive.

We believe that our results contribute to the body of research in the field of wireless device use and fertility. It is our hope that our findings may be employed to help develop policies and guidelines in the Caribbean region regarding the use of these devices while trying to conceive.

5 References

Avendaño, C., Mata, A., Sanchez Sarmiento, CA., Doncel, GF. (2012). Use of laptop computers connected to internet through Wi-Fi decreases human sperm motility and increases sperm DNA fragmentation. Fertil Steril. 2012;97:39–45 e2.

Carroll, K., Pottinger, A. M., Wynter, S., & DaCosta, V. (2020). Marijuana use and its influence on sperm morphology and motility: identified risk for fertility among Jamaican men. Andrology, 8(1), 136–142. https://doi.org/10.1111/andr.12670.

Sheynkin, Y., Jung, M., Yoo, P., Schulsinger, D., Komaroff, E. (2005). Increase in scrotal temperature in laptop computer users. Hum Reprod 2:452–455.

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7 Further Information

Please contact me at lancefordsterling@live.com if you have any questions or comments.