Automated versus manual RNA isolation for the laboratory diagnosis of SARS-CoV-2.

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Background
The rapid spread and huge health and economic impact witnessed even from the beginning of the COVID-19 pandemic prompted the development of diagnostic tests to opportunely identify individuals infected by its causing agent, the SARS CoV-2 virus. This is a prerequisite to quarantine them to avoid further spreading the infection specially to their vulnerable co-workers and family contacts. The golden standard for pathogen detection is the Polymerase Chain Reaction (PCR). To obtain an accurate result, it is important to carry out an optimal isolation of the viral RNA genome.

Methods
This study aimed to compare manual (kits of Qiagen or DAAN) vs automatic (SMART-32 equipment of DAAN) RNA isolation methods. 372 samples were processed of which 200 were negative and 172 were positive of which 181 were processed manually and 191 automatically. Pre-analytical characterization of the RNA resulting from both methods included quantification of yield and qualification of purity by spectrophotometry in the Nanodrop (Thermo-Fisher, Mexico City). Results were comparatively evaluated employing the IBM SPSS Statistics software.

Results
The median yield of RNA obtained by the manual method resulted higher than that rendered by the automatic method. Regarding purity (as judged by the ratios of $A_{260/230}$ and $A_{260/280}$) the manual method reflected better parameters than the automated one. On the other hand, when dealing with large amounts of samples, the latter was more convenient and faster.

Conclusions
The manual method gives slighter better yield and purity than the automated one. However, quality wise, RNA from both methods is equally suitable for RT-PCR diagnosis of the SARS-CoV-2. The demand in the laboratory for processing large volumes in the minimal time, tips the scale to the automatic method.

Keywords: COVID-19, SARS-CoV2, RNA isolation, Manual, Automated, RT-PCR